BY ORDER OF THE SECRETARY OF THE AIR FORCE

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Flying Operations

EC-130E/H--OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This volume implements AFPD 11-2, *Aircraft Rules and Procedures*; AFPD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. It applies to all active duty EC-130E/H units and their assigned Back-up Aircraft Inventory (BAI) aircraft. This volume does not pertain to the Air National Guard or the Air Force Reserve. This document is new and must be completely reviewed. The major command (MAJCOM) will forward proposed MAJCOM/DRU/FOA-level supplements to this volume to Air Staff and the lead MAJCOM/DRU/FOA office of primary responsibility (OPR) for approval in accordance with (IAW) AFPD 11-2. Copies of MAJCOM/DRU/FOA-level supplements, after approved and published, will be provided by the issuing MAJCOM/DRU/FOA to HQ AFFSA/XOF, HQ ACC/DOTV, and the user MAJCOM/DRU/FOA and National Guard Bureau (NGB) offices of primary responsibility. Field units below MAJCOM/DRU/FOA level will forward copies of their supplements to this publication to their parent MAJCOM/DRU/FOA office of primary responsibility for post publication review. **NOTE:** The terms Direct Reporting Unit (DRU) and Field Operating Agency (FOA) as used in this paragraph refer only to those DRUs/FOAs that report directly to HQ USAF. Keep supplements current by complying with AFI 33-360V1, *Publications Management Program* (periodic review). See paragraph **1.6.** of this volume for guidance on submitting comments and suggesting improvements to this publication.

The Privacy Act of 1974 applies to certain information gathered pursuant to this volume. The Privacy Act System Number F011 AF XO A, Air Force Operations Resource Management Systems (AFORMS) covers required information.

The Paperwork Reduction Act of 1974 as amended in 1996, affects this volume.

Chapter 1

GENERAL INFORMATION

1.1. General. This directive is for EC-130E/H (ABCCC and 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/DOT 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-130 Dash 1.

1.3. Deviations and Waivers. Deviations from these procedures require specific approval of HQ ACC/DO (or other authority specified in this volume), unless an urgent requirement, safety, or aircraft emergency dictates otherwise, or when immediate action is necessary to protect the crew or aircraft from a situation not covered by this volume. 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/DO. Forward waiver requests to HQ ACC/DOT for staffing, with informational copies to HQ ACC/DOZ or HQ ACC/DOY, as necessary. When chopped to another MAJCOM, forward waiver requests through the chain of command to MAJCOM stan/eval, JFACC, or COMAFFOR, as appropriate, with informational copies to HQ ACC/DOZ and HQ ACC/DOY. Waivers issued by HQ ACC/DO 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/DO must approve long-term (permanent) waivers.

1.4. Supplements. This document is a basic directive. Supplement this AFI according to AFPD 11-2. Supplements will not duplicate, alter, amend, or be less restrictive than the provisions of this AFI or the appropriate C-130 flight manual.

1.4.1. 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 aircrew, planners, and staff contact OPR 24-hours via ACC Command Post or Contingency Action Team (CAT) (see **Chapter 4**).

1.4.2. Local Procedures Chapter. Units will send one copy of **Chapter 10** (local procedures) to 12 AF/OV for coordination and approval. 12 AF/OV will then forward a copy to HQ ACC/DOTV.

1.5. Official Version and Source. This volume is available on the Air Force Publishing web site at **http://afpubs.hq.af.mil**/.

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

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.

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 non-close-hold 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.

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/DO and COMACC as appropriate.

2.3. Detachment Commander (DETCO):

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

2.3.1.1. For single-aircraft deployments, the DETCO may be one of the primary crewmembers. However, under normal circumstances when the deployment involves more than one aircraft, the DETCO should not be a primary crewmember. DETCOs may augment deployed crews as necessary.

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

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

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

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

2.3.2.4. Coordinating with maintenance supervision, and ensuring maintenance personnel know of aircraft and fuel requirements.

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

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

2.4. Aircraft Commander (AC) Responsibility and Authority. Flight authorization designates an AC on all flights, in accordance with AFI 11-401, *Flight Management*, as supplemented.

2.4.1. ACs 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 and safely accomplish the mission.

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 or aircraft.

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. In accordance with (IAW) AFI 11-401, as supplemented, eligible pilots may alternate command responsibility. Ensure all crewmembers are aware 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 AC on the flight authorization, the IP/EP will assume command when safety or emergency 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 off-station 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: 574-5411; commercial: 757-764-5411) via telephone notification from host wing command posts. The host wing command posts receive their data directly from aircrew or via the en route 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 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 the-

ater 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. Methods of communicating this information include HF phone patch, 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 reestablished. 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 i.e., movement reporting, itinerary revisions, maintenance status, flight plan information, weather and/or aircraft emergencies, or other important flight information, as appropriate.

2.5.3. En route Reporting. En route 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/En route 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.

2.5.3.1.4.1. A-1. No maintenance required.

2.5.3.1.4.2. 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).

2.5.3.1.4.3. A-3 (Plus Noun). Major maintenance. Delay is anticipated. Affected units or systems are to be identified as in A-2 status above.

2.5.3.1.4.4. A-4. Aircraft or system has suspected or known biological, chemical, or radiological contamination.

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 en route or terminal weather conditions or facilities. In the event of an emergency or weather-related divert or reroute, the DETCO or AC must notify the controlling authority as soon as possible.

2.6.1.1. The controlling agency directing the rerouting or diversion is responsible for ensuring 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 center 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 en route, the AC will coordinate with the C2 center for other suitable alternates. The C2 center 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 mission design series (MDS) 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). **EXCEPTION:** Senior staff members who have completed a Senior Staff Familiarization course may occupy either pilot seat under direct IP supervision. These individuals will log "OP" for Flight Authorization Duty Code on the AFTO Form 781, **AFORMS Aircrew/Mission Flight Data Document**.

3.1.1. Pilots:

3.1.1.1. Qualification Requirements. Only a pilot that is qualified (current and valid AF Form 8, **Certificate of Aircrew Qualification**, for the MDS and occupied position), and current IAW AFI 11-2EC-130E/HV1, *EC-130E/H--Aircrew Training*, will occupy a pilot's seat with passengers on board the aircraft. **EXCEPTION:** A pilot regaining currency under direct IP supervision (in the seat at the controls) may also fly with passengers on board.

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 Ground Personnel (MEGP) on board.

3.1.1.3. Left Seat Training. With squadron commander approval, current and qualified copilots may be allowed to fly in the left seat provided they are under direct IP supervision and no passengers are carried. Outline approval procedures and methods of documentation in **Chapter 10** of this volume.

3.1.2. Navigators, Flight Engineers (FE), and AMTs/Scanners. Non-current or unqualified navigators, FEs, or AMTs/Scanners 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).

3.2. Crew Complement. Minimum crew complement will be as follows:

3.2.1. Basic Crew is defined as one Pilot, Co-Pilot, Navigator, FE, and AMT/Scanner.

3.2.2. Augmented Crew is defined as basic crew plus an additional AC, navigator, FE, and AMT/Scanner.

3.2.3. 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 designated training missions if reported or forecast thunderstorms or other inclement weather exists. Units will post procedures regarding the use of navigators on proficiency trainers in **Chapter 10** of this volume.

3.3. Mission Essential Ground Personnel (MEGP). MEGP status is granted to individuals on a case-by-case basis who perform unique support duties directly related and essential to a particular aircraft,

aircrew, or mission. These duties require direct access to the aircraft and/or aircrew during ground or flight operations. MEGPs travel in passenger status, but report through the command and control center to the AC. MEGP authority must be in the individual's orders or other written authorization. MEGPs 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 MEGP status is specified in AFI 11-401, as supplemented.

3.4. Scheduling Restrictions. Refer to AFI 11-202V3, Chapter 9, as supplemented, for further guidance. Aircrew members will not be scheduled to fly, nor will they perform crew duties. **NOTE:** Do not takeoff early (before scheduled departure time) if the early takeoff time would violate the following restrictions:

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

3.4.2. After consuming alcoholic beverages within 12 hours of takeoff, within the 12-hour period prior to assuming standby force duty, or when under the influence of alcohol.

3.4.3. Within 72 hours of donating blood. The flying unit commander must approve the donation of blood by aircrew members in a mobility assignment or who are subject to flying duties within this 72 hour period. Aircrew members should not normally donate blood.

3.4.4. 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, *Medical Examinations and Standards.* The following is a partial list of medications, which may be used without medical consultation:

3.4.4.1. Skin antiseptics, topical anti-fungal, 1 percent Hydrocortisone cream, or benzoyl peroxide for minor wounds and skin diseases, which do not interfere with the performance of flying duties or wear of personal equipment.

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

3.4.4.3. Antacids for mild isolated episodes of indigestion.

3.4.4.4. Hemorrhoidal suppositories.

3.4.4.5. Bismuth subsalicylate for mild cases of diarrhea.

3.4.4.6. 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.

3.4.5. Within 24 hours of compressed gas diving (including scuba), surface supplied diving, or hyperbaric (compression) chamber exposure and aircraft pressurization checks that exceed 10-minute duration.

3.4.6. Within 12 hours after completion of a hypobaric (altitude) chamber flight above 25,000 feet. Personnel may fly as passengers in aircraft during this period, provided the mission will maintain a cabin altitude of 10,000 feet MSL or less. For altitude chamber flights to a maximum altitude of 25,000 feet or below, aircrew members may fly without delay as aircrew members or passengers if cabin altitude will not exceed 15,000 feet.

3.4.7. Aircrew members who accomplish aircraft ground pressurization checks of less than 10 minutes duration will be restricted from flying for 30 minutes.

3.5. Inter-fly:

3.5.1. Squadron operations officers may authorize inter-fly of aircrews and aircraft between wings, groups, and squadrons 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/DO 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, 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/DO of the agency with OPCON.

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/DO 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 crewmember 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/DO, 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, Chapter 9, and this paragraph. The minimum crew rest period is 12 hours unless waived by HQ ACC/DO.

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 crewmembers time to resolve personal affairs. During these first 12 hours, crewmembers may perform limited non-flying duties, including mission planning. OG/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. En route 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: If any aircrew member must stay at the aircraft past the 45-minute period, crew rest does not begin until all crewmembers have completed post-flight duties.

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.

3.7.3. Post-Mission Crew Rest (PMCR). Aircrew members returning to their home base will be given sufficient time to recover from the cumulative effects of their deployed mission and tend to personal needs. Provide 1 hour of PMCR time for each 3 hours TDY (up to a maximum of 72 hours) when the duty exceeds 16 hours away from home station. If Standby Force Duty preceded the TDY, PMCR time will be calculated from the start of the Standby Force Duty (see paragraph **3.8.**). This time will not run concurrently with pre-departure crew rest. PMCR begins immediately upon mission termination. Crewmembers will not be required to get immunizations, engage in ground training, perform standby or squadron duties, or perform any other activity that would encroach upon crew rest. The OG/CC or acting representative is designated PMCR waiver authority, and will not delegate this authority. Waivers for PMCR are considered on a case-by-case basis only with the concurrence of the individual crewmember. PMCR is not applicable to rotational crews or continuing missions.

3.7.4. Post Leave/TDY Standdown. Afford crew members time off following extended leave or TDY IAW AFI 11-202V3, as supplemented, paragraphs 9.6.4 and 9.6.5. The purpose of this time off is recovery and reconstitution, and to take care of quality-of-life issues that need attention after a lengthy absence from home station or the aircraft. Crewmembers will be "present for duty" in the local area, or be on leave or a pass (IAW DOD Directive 1327.5, *Leave and Liberty*; and/or AFI 36-3003, *Military Leave Program*) if they travel outside the local area. OG/CC will define the local area and the policy for "present for duty," or delegate this to individual squadron commanders. OG/CC is waiver authority for post TDY standdown.

3.7.5. Crew Chief Work and Rest Plan. The crew chief is responsible to the AC. The AC, in conjunction with the en route 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, *Maintenance Operations and Management Policy*, 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.

Chapter 4

AIRCRAFT OPERATING RESTRICTIONS

4.1. Objective. 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 to effectively communicate the status of an aircraft:

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. An 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 operational.

4.2. 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 are grounding items.

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. The diversity of the C-130 operating on various worldwide missions

complicates the task of balancing operational reliability with safe mission completion. 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. Use C2 channels to notify the appropriate execution agency of intentions. Plan a minimum 1-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 OG/CC). Waiver authority for local missions is the OG/CC or designated representative.

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

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 controlling 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/DO 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 C-130 aircraft. Aircraft will not depart their home stations unless MEL home station requirements are met. **EXCEPTION:** During wartime, en route criteria will apply to all aircraft departures.

4.6.2. En route. En route locations where C-130 maintenance repair capability exists. An en route 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 that departs home station to perform training and is planned to return in the same day.

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 sup-

ported by deployed home station logistics. **NOTE:** Off-station trainers are considered local training for the purposes of this chapter.

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. **NOTE:** EC-130 GPS systems are not certified for IFR operation; they are mission enhancement systems only. Comply with AFI 11-202V3, chapter 5, with regard to GPS systems.

4.7.1.1. SCNS Aircraft. Fully operational SCNS, to include the navigator's Integrated Display Computer Unit (IDCU) and either the pilot or copilot's IDCU.

4.7.1.2. Non-SCNS Aircraft. Doppler and INS, or dual INS.

4.7.1.3. Sextant and Sextant Mount. (Not required on aircraft with integrated GPS or dual INS.)

4.7.1.4. 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: length and route of flight, weather, and 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. 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. EC-130E/H aircraft/crews are not equipped/trained to carry cargo. 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. 1C-130A-9 and TO 1EC-130H(CC)-9. The following restrictions apply to all EC-130E/H flights unless a loadmaster is part of the basic crew, or waiver is obtained IAW para **4.3.**:

NOTE: With the addition of a certified loadmaster to the basic crew, this paragraph is waived and cargo (including hazardous cargo) may be carried on AF65-0962 or EC-130E aircraft without the ABCCC capsule installed at the loadmasterís discretion IAW TO 1C-130A-9.

NOTE: Unless a loadmaster has been added to the crew, cargo and baggage will not be loaded until the FE and AMT/Scanner have preflighted the cargo compartment/capsule. The FE and AMT/Scanner will supervise all loading. The FE will calculate weight and balance and center of gravity. When a loadmaster is added to the crew, the loadmaster will supervise all loading and calculate weight and balance and center of gravity, with the assistance of the FE.

4.8.1. No palletized cargo will be carried.

4.8.2. No hazardous cargo (as defined by AFJMAN 24-204, *Preparing Hazardous Materials for Military Air Shipments*.).

4.8.3. EC-130H

4.8.3.1. Total weight will not exceed 1500 pounds

4.8.3.2. No single item over 400 pounds

4.8.3.3. Loading restrictions:

4.8.3.3.1. Block 20. Do not load/secure baggage or equipment directly in front of computer bays 1 and 2. Personal and professional equipment may be loaded behind the mission equipment (next to the wheel wells), provided the mission equipment is shielded from damage.

4.8.3.3.2. Block 30. 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 tiedown devices are available, mission equipment is shielded, weight and balance is maintained, and safety is not compromised.

4.8.4. EC-130E.

4.8.4.1. With ABCCC capsule installed:

NOTE: The primary cargo and baggage areas (with capsule installed) are aft of the right and left wheel wells. The capsule will not be used for cargo or any object that requires restraint. The area forward of the capsule and capsule aisle will be kept clear of cargo and equipment to allow for emergency ground egress. Cargo may be stowed between flight station 245 and the capsule providing it is properly secured and the AMT/Scanner can scan the wings and engines.

4.8.4.1.1. Total weight will not exceed 500 pounds

4.8.4.1.2. No single item over 400 pounds

4.8.4.1.3. LPU's for all battle staff crew members will be stored in the overhead bins at each crew position during flights over water. If battle staff members are required to carry parachutes, seat kits, anti-exposure suits, or survival vests, these items will be stored in the appropriate storage areas at each crew position. If required, the flight crew's parachutes and seat packs will be stowed forward of the left wheel well.

4.8.4.2. Without ABCCC capsule installed (and AF65-0962):

4.8.4.2.1. Total weight will not exceed 1500 pounds

4.8.4.2.2. No single item over 400 pounds

Table 4.1. Engines/Auxiliary Power Unit (APU)/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.

Table 4.3. Electrical System (See Note).

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Generators, Engine-Driven	4	4	
Generators, Engine-Driven (En route)	4	3	If a generator fails at an en route stop, flight to a destination with repair capability, including en route 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.
Generators, Engine Driven (Local Training)	4	3	Local training missions may continue after a generator is disconnected or removed and the mount padded, 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, flight in visual meteorological conditions (VMC) is authorized provided no other electrical malfunctions exist.
Generator Out Lights	4	3	(See note)
AC Loadmeter	4	3	(See note)
Note: All associated equipment and indicators will be operational for each operative engine-driven generator (generator control panel, voltage regulator, generator out/caution light, AC loadmeter, etc.).			

Table 4.4. Fuel Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Main Tank Fuel Pumps	4	4	One main tank fuel boost pump may be inoperative for 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	Auxiliary tank fuel pumps should be operational for any tank containing fuel.
External Tank Fuel Pumps (per tank, if tank contains fuel)	2	1	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 (En route) (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 en route 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 the symmetrically opposite quantity indicator has decreased to 1,500 lbs (inboards) and 2,500 lbs (outboards). 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, pilot pro sorties) will terminate with a minimum of 8,000 lbs calculated main tank fuel.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Main Fuel Quantity Indicators (Local Training)	4	2	Local training flights may be conducted with two inoperative main tank indicators provided: 1. Inoperative indicators are asymmetrical. 2. Main tanks fuel quantity is visually verified using the fuel tank dip stick. The fuel tank dipstick is calibrated for JP-4. Use with other fuels is inaccurate for reading pounds of fuel quantity. 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.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Auxiliary Tank Fuel Quantity Indicators	2	0	If fuel quantity indicator is inoperative, fuel quantity will be verified with the magnetic sight gauge.
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 System.

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 Overtemperature Warning Lights	7	7	

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Propeller Anti-Icing and Deicing Systems	4	0	Blade De-Icing will be operational for flight into known or forecast icing conditions.
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/En route)	1	1	The antiskid may be inoperative for flight to a destination with repair capability, including en route 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.

Table 4.8. Flight Recorder/Locating Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Flight Data Recorder	1	1	See Note
Cockpit Voice Recorder (CVR)	1	1	See Note
Emergency Locator Transmitter	1	1	
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	2	2	Pressurization and both air conditioning systems should be operational. If a system fails, flight to a destination with repair capability (including en route 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	0	
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 en route stops), provided the gear is not moved from the down and locked position. Flight (including en route stops) with landing gear doors removed may be accomplished to a destination with repair capability.
Landing Gear Position Indicators	3	3	
Landing Gear Warning Light	1	1	
Parking Brake	1	1	

Table 4.12. Flight Instruments.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Airspeed Indicator	2	2	
Vertical Velocity Indicator	2	2	
Flight Director Systems	2	2	
Attitude Director Indicator (ADI)	2	2	
Standby ADI (if installed)	1	1	
Horizontal Situation Indicators	2	2	
EFI Displays (if installed)	4	3	
BDHI	3	0	
Standby ADI	1	1	
Barometric Altimeters	3	2	Both pilots' altimeters must be operational.
CARA (If Equipped)	1	0	Always required if carrying passengers.
GPWS (if equipped)	1	0	Always required if carrying passengers.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
GCAS (if equipped)	1	0	Always required if carrying passengers.
TCAS (if equipped)	1	0	Always required if carrying passengers.
Central Air Data Computer (if installed)	1	1	
#1 UHF Manual Control Head Radio (SCNS only)	1	1	
Central Air Data Computers (CADC)	1	1	

Table 4.13. Navigation Systems.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Standby Magnetic Compass	1	1	
Heading Systems	2	1	
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	0	As required for Air Traffic Control (ATC) and mission requirements. (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. Aircraft will not depart with an IFF known to be inoperative. 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	Not required for daylight operations. Two lights per wing will be operational for night formation flights.
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	
Wing Leading Edge Lights	2	0	
Primary Instrument Cockpit Lighting	1	0	(See note.)
Note: All edge "peanut" lighting or backlit lighting (depending on aircraft model) will be operational for night operations for the following instruments; airspeed, altimeters, VVI/VVSI, 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. Unpressurized flight, with no cargo on the ramp, may be performed with a cargo ramp lock malfunction when mission requirements dictate.

Item/System	Installed	Operational	Remarks/Limitations/Exceptions
Aft Cargo Door and Locking System	1	1	Pressurized flight may be performed with an aft cargo door lock malfunction when mission requirements dictate.
Crew Entrance Door and 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 Volume 3 or MAJCOM checklists and briefing guides, and NAF or OG/OGV approved information guides. Unapproved items may not be inserted within authorized checklists. 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 OG-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 staff members who have completed the Senior Staff Familiarization Course.) Only one pilot may be absent from their duty station at a time, and only if the FE is at his/her duty station. Both pilots will be in their seats when the FE is not in his/hers.

5.2.1. Pilots, navigators, and FEs 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 crewmembers may occupy other stations, with MCC/DABS and AC concurrence, only if doing so will not interfere with normal crew duties.

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

5.3. Flight Station Entry. ACs may authorize passengers, observers, MEGP, and any crewmember access to the flight station during any phase of flight. Do not allow more than seven individuals on the flight deck simultaneously. 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. The pilot in command 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 who is designated AC on the flight authorization (see paragraph **2.4.2.**).

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. Copilots may takeoff or land from the right seat if an AC with over 100 hours occupies the left seat, or from either seat if an instructor of flight examiner occupies the other seat. Comply with paragraph **3.1.1.3.**

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.

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 their opinion, marginal conditions exist.

5.5. Landing Gear and Flap Operating Policy. The pilot in the right seat will operate the landing gear. The pilot not flying the aircraft will operate the flaps. Actuate the landing gear or flaps only after command of the pilot flying 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 crewmembers to assist in outside watch during all taxi operations and in-flight during arrivals and departures. Crewmembers designated to perform these duties are exempt from the requirements of paragraph **5.7.** during taxi.

5.7. Seat Belts:

5.7.1. Crewmembers 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, and landing, unless crew duties require otherwise (the flight engineer is exempt from wearing the shoulder harness for ground operations). Crewmembers 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.

5.8. Aircraft Lighting. Operate aircraft lighting IAW **Chapter 4** of this volume, AFI 11-202V3 and applicable TOs.

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. Smoking Restriction. Smoking is prohibited on board the aircraft.

5.10. Advisory Calls. The pilot flying will periodically announce intentions during departures, arrivals, approaches, and when circumstances require deviating from normal procedures. Mandatory advisory calls are: (The pilot not flying the aircraft will make these calls except those designated for any crewmember.)

5.10.1. 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.").

5.10.2. Altitude Calls:

5.10.2.1. Transition altitude/level.

5.10.2.2. One thousand feet above/below assigned altitude.

5.10.2.3. One hundred feet above/below assigned altitude to include minimum descent altitude/ decision height (MDA/DH).

5.10.3. Approaches:

5.10.3.1. Call 100 feet above procedure turn, final approach fix (FAF), MDA, or DH altitude.

5.10.3.2. Non-precision approaches:

5.10.3.2.1. "Minimums" when reaching MDA.

5.10.3.2.2. "Runway in sight." Call when the runway environment is in sight. This call will not be made until certain that obstructions to vision, such as fog, haze, low stratus clouds, etc., will not subsequently obscure view of the runway environment.

5.10.3.2.3. "Go-around." Call at missed approach point if the runway environment is not in sight or if the aircraft is not in a position for a safe landing.

5.10.3.3. Precision Approaches:

5.10.3.3.1. "Land." Call at DH if runway environment is in sight and the aircraft is in a position for a normal landing.

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

5.11. Deviations.

5.11.1. The pilot not flying the aircraft will tell the other pilot 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.

5.11.2. 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.

5.12. Communications Policy:

5.12.1. Aircraft Interphone:

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

5.12.1.2. Flight crewmembers (including AMT/Scanner) will monitor interphone/flight crew hot mic at all times. All crewmembers 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 crewmembers and battle staff will monitor interphone/flight crew hot mic as directed by the AC or MCC/DABS.

5.12.2. Command Radios:

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

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

5.12.2.3. A primary flight deck crewmember will monitor UHF emergency frequency 243.0 MHz regardless of primary radio.

5.12.2.4. 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.

5.13. 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 crewmembers. It encompasses all aspects of the mission, from planning through debriefing.

5.13.1. 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.

5.13.2. Crewmembers responsibility includes respecting the authority of the aircraft commander, sometimes in spite of personality differences. Participate in the mission and decision-making process, and support the AC. Crewmembers must assert their best judgment and, when in doubt, speak out. The AC is the final decision authority.

5.13.3. "Time Out" is the common assertive statement for use by all crewmembers. It provides a clear warning sign of a deviation or loss of situational awareness. As soon as possible after a "Time Out" call, the pilot will stabilize the aircraft, safety permitting. The AC will then allow the crew to voice

concerns. Based on crew inputs, the AC will decide whether to continue the current course of action or pursue another. The AC is final decision authority.

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

5.14.1. When no reported RCR is available, consider the runway surface wet when water on the runway causes a reflective glare.

5.14.2. The performance charts used to determine braking action are based on concrete runways. The RCR values for the following runway surfaces depicted in **Table 5.1.** are estimates based on operational experience and should be used only as a guide.

Table 5.1. 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	16	5
Coral	16	4
Crushed Rock	16	5

5.14.3. Limit EC-130 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.

5.15. Runway and Taxiway Requirements:

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

5.15.2. Minimum runway for landing is landing distance from 50 feet over the threshold plus the RVR/visibility correction factor specified in **Table 5.2.**

5.15.3. Minimum runway required for takeoff is critical field length plus 50 feet for each foot of screen height required by the departure procedure. If required screen height is not available or cannot be determined, use critical field length plus 1750 feet as minimum runway.

Table 5.2. RVR/Visibility Correction Factors.

RVR (Visibility):	Add to Landing Distance:
Less than 40, (3/4)	1,000 feet.
Equal to or greater than 40, (3/4)	500 feet.
Note: If the runway length available for landing is less than required above, mission ready pilots may use landing ground roll plus 1,000 feet as minimum runway length when approved by OG/CC or equivalent. In this case, modify the landing to touchdown in the first 500 feet of runway.	

5.16. Aircraft Taxi and Taxi Obstruction Clearance Criteria:

5.16.1. After landing and clearing the runway, and with approval of the pilot, the Airborne Maintenance Technician (AMT)/Scanner may open the aft cargo door and lower the ramp to approximately 12 inches above horizontal in preparation for back taxi if needed.

5.16.2. 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 Operations and Movement on the Ground*, 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.

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

5.16.4. Reverse Taxi:

5.16.4.1. The pilot will coordinate reverse taxi directions and signals to be used with the AMT/Scanner and marshaller (when available).

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

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

5.16.4.2.2. The AMT/Scanner will be on the aircraft ramp in the best position to direct reverse taxi, report any hazards, and provide the pilot with timely interphone instructions on turns, distance remaining, conditions of the maneuvering area, and stopping point. If an ABCCC capsule is installed, the AMT/Scanner will be positioned in the rear capsule door.

5.16.4.3. During night reverse taxi operation, the pilot and AMT/Scanner will ensure that the taxi area is sufficiently lighted.

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

5.17. Operating With BAK-12 Systems. EC-130 aircraft operations are authorized on runways where BAK-12 systems are installed with an eight-point cable tie-down system without regard to the Dash-1 Caution. When operating from runways equipped with other types of systems, or if it is unknown if the BAK-12 system includes eight point tie-downs, comply with the appropriate dash one guidance.

5.18. Classified Equipment and Material:

5.18.1. Equipment. When classified equipment is aboard, ensure the C2 or the base operations officer is aware of the requirement for aircraft security in accordance with this volume. At bases not under jurisdiction of the USAF, ensure the aircraft and equipment are protected. Do not leave classified information stored in navigation (e.g., INS, SCNS), radio equipment (e.g. KY-58, KY-75, SATCOM, Mode 4) or mission systems unless appropriate security measures are taken and equipment is properly guarded.

5.18.2. Material. Ensure authenticators and other classified materials are turned in at destination and receipts are obtained for classified material if necessary. The aircraft gun storage box or high value bin can be used for material up to secret if a storage facility is not available.

5.18.3. Emergency Destruction. Destroy/damage classified material/equipment prior to a crash landing or bailout if possible.

Chapter 6

AIRCREW PROCEDURES

Section 6A—General

6.1. Aircrew Uniforms. Wear the aircrew uniform on all missions unless otherwise authorized. When the USAF Foreign Clearance Guide requires civilian attire, wear conservatively styled civilian clothing. Squadron commanders will determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate, and terrain involved.

6.1.1. All crewmembers will have NOMEX flight gloves in their possession.

6.1.2. All crewmembers will wear flight gloves during takeoff, landing, air refueling, and as directed by the AC.

6.1.3. Crewmembers will remove rings and scarves, and will secure any jewelry that presents a potential for catching, snagging, pulling, and tearing prior to performing aircrew duties.

6.2. Personal and Professional Equipment. 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. Identification tags.

6.2.3. Other items such as mobility folders, shot records, and passports may be required by squadron commander/DETCO, or other command directive.

6.3. Tool Kits. At least one AMT/Scanner tool kit will be aboard the aircraft for all missions. During ABCCC capsule trainer sorties, the AMT will checkout a multimeter.

6.4. Publications. Primary crewmembers will carry the publications specified in **Table 6.1.**, including all applicable supplements, on all missions. Units may specify additional publications in local **Chapter 10**. This requirement is satisfied when fully posted publications are kept on board the aircraft. When there are multiple crewmembers per crew position, coordinate to ensure all required publications are carried.

6.5. Flight Crew Information File (FCIF):

6.5.1. Review the FCIF before all missions. Go/No Go status will be IAW AFI 11-202V2, *Aircrew Standardization/Evaluation Program*. During exercises and contingencies, deployed squadron staff will develop procedures to comply with this paragraph and local requirements.

6.5.2. Crewmembers delinquent in FCIF review and joining a mission en route will receive an FCIF update from their primary aircrew member counterpart on that mission. Instructor pilots flying with general officers or senior staff members are responsible for briefing appropriate FCIF items.

6.5.3. Crewmembers not assigned or attached to the unit operating a mission will certify FCIF review by entering the last FCIF Volume I, Part B number and their initials on the flight orders.

Table 6.1. Required Publications.

PUBLICATION	EC-130E	EC-130H
Aircraft Flight Manual (-1)	E	E
Aircraft Performance Manual (-1-1)	E	E
Aircraft Flight Manual (SCNS -1-4)	CP	N/A
Abbreviated Checklists (-1 and AFI 11-2EC-130V3)	ALL	ALL
TO 1C-130-101	E	E
TO 1C-1-29	CP	CP
AFI 11-202, Volume 3	CP	CP
AFI 11-2EC-130E/H, Volume 3	CP	CP
Appropriate Fuel Planning Document	N	N

6.6. Mission Kits/Aircrew Bricks. Carry mission kits on all missions. Contents of the mission kits will be determined by mission requirements. Supplement mission kits as necessary for contingency operations. Suggested items include, but are not limited to, the following (* indicates mandatory for all missions, if applicable; + indicates mandatory for all missions away from home station, if applicable):

6.6.1. Publications:

6.6.1.1. AFI 11-401, *Flight Management*

6.6.1.2. AFI 11-2EC-130E/HV1, *EC-130E/H--Aircrew Training*

6.6.1.3. +AFI 23-202, *Buying Petroleum Products and Other Supplies and Services Off-Station*

6.6.1.4. +Airfield Suitability and Restrictions Report (ASRR)

6.6.1.5. TO 1-1C-1, *Basic Flight Crew Air Refueling Manual*

6.6.2. Forms:

6.6.2.1. DD Form 1351-2, **Travel Voucher or Sub-voucher**

6.6.2.2. +DD Form 1854, **US Customs Accompanied Baggage Declaration**

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

6.6.2.4. *DD Form 2131, **Cargo/Passenger Manifest**

6.6.2.5. +AF Form 15, **United States Air Force Invoice**

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

6.6.2.7. +AF Form 315, **United States Air Force AvFuels Invoice**

6.6.2.8. AF Form 457, **USAF Hazard Report**

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

6.6.2.10. AF Form 1297, **Temporary Issue Receipt**

6.6.2.11. +AF Form 4108, **C-130 Fuel Log**

6.6.2.12. *AFTO Form 151A, **Individual C-130 Aircraft Usage Log**

6.6.2.13. *AF Form 4091, **Mission Data** (or local mission summary sheet)

6.6.2.14. AF Form 711, **USAF Mishap Report**

6.6.2.15. AF Form 4031, **Crew Resource Management Assessment Sheet**

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

6.6.2.17. DD Form 175, **Military Flight Plan**

6.6.2.18. DD Form 1801, **DoD International flight Plan**

NOTE: The completed flight plan for the flight should be carried on board the aircraft.

6.6.2.19. 175-1, **Flight Weather Brief**

6.6.3. Orders:

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

6.6.3.2. +AF Form 1631, **NATO Travel Orders**

6.6.3.3. *Flight Authorization (IAW AFI 11-401)

6.7. Route Navigation Kits:

6.7.1. Crews will be issued a route navigation kit, which will remain with the aircraft until return to home station. Kits should contain sufficient quantities of material to cover the complete round trip and the planned theater of operation.

6.7.2. **Table 6.2.** contains minimum requirements for route navigation kits.

6.8. Authentication and Classified Documents. Obtain and safeguard current authentication and operational code documents. These documents are required for flights into an ADIZ when participating in exercises, ORIs, deployments, and when specified by OPLANs or Tasking Orders.

Section 6B—Flight Planning

6.9. Airfield Review. Comply with AFI 11-202V3, as supplemented. Comply with all restrictions in the ASRR unless waived by appropriate authority.

6.10. Flight Plans. MAJCOM approved Computer Flight Plans and forms may be used in lieu of a manually computed flight plan and fuel log. The AC and navigator flying the mission will verify fuel, routes and altitudes when a planning team completes the flight plan.

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 En route Charts (High and Low)	2	2

Publication (applicable to area of operation)	Number Required	
FLIP Area Charts (Terminal)	2	2
FLIP Instrument Approach Procedures (Terminal) (High and Low)	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
Engine-out Departure Procedures (if available)	As Required	As Required
Notes: 1. A current Air Almanac and Navigation Sight Reduction Tables will remain on the aircraft at all times. 2. FLIP Planning Books (GP, AP/1/1B/2/3) are required only when missions are planned to operate overseas.		

6.11. Gross Weight (GW). Ensure the aircraft does not exceed the maximum GW, zero fuel weight, or center of gravity limitations specified in the aircraft flight manual, unless waived by MAJCOM/DO.

6.11.1. 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.

6.11.1.1. Takeoff GW must not exceed that which would lower the rate of climb to less than that required by para **6.12.** below.

6.11.1.2. Takeoff GW must not exceed that which would require CFL in excess of **Chapter 5** requirements.

6.12. Departure:

6.12.1. General. Aircrews should be aware that the term "IFR" refers to the set of rules to be followed, regardless of actual weather conditions. Pilots are expected to "see and avoid" terrain and other traffic when weather conditions allow, but IFR procedures are developed on the assumption that this is not possible. Therefore, IFR departure may not be authorized from some airfields regardless of weather conditions.

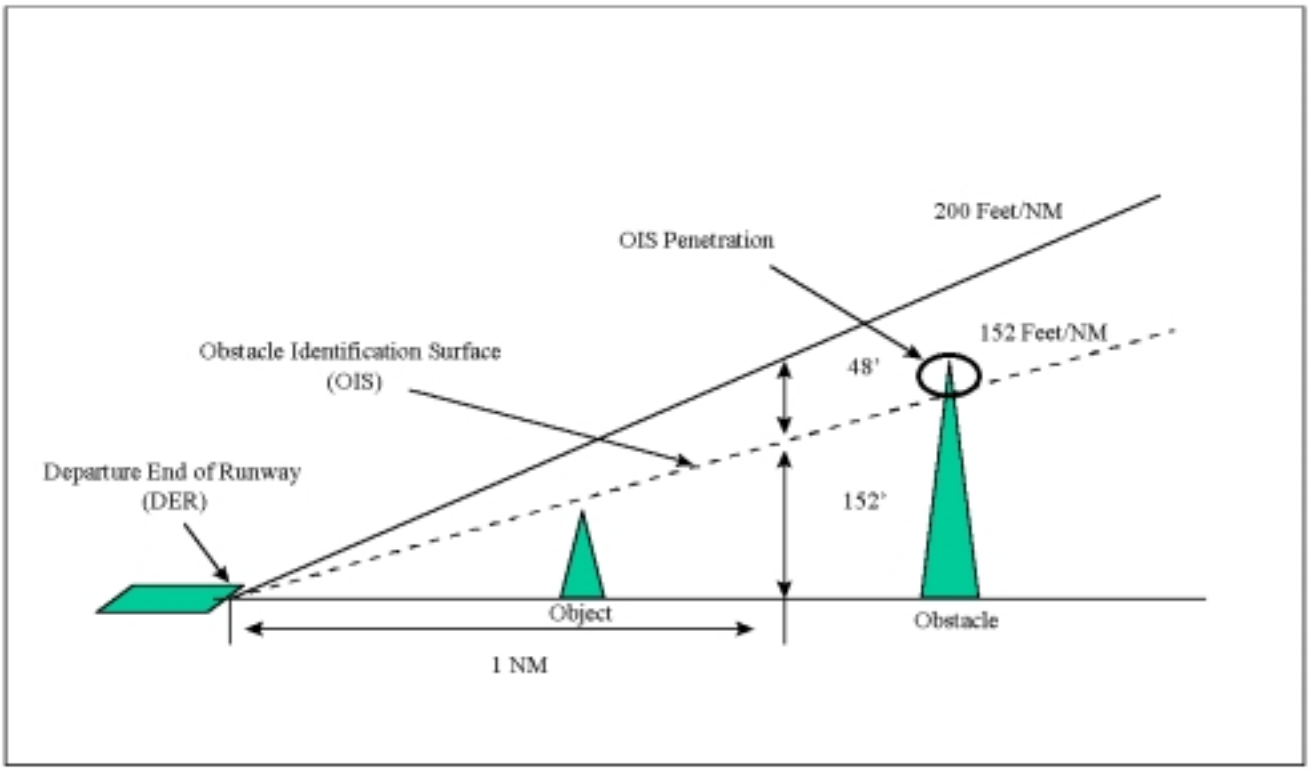
6.12.2. IFR Departures. Comply with AFI 11-202V3, as supplemented, and AFMAN 11-217, *Instrument Flight Procedures*. Review appropriate terrain charts, sectional charts, engine-out departure procedures (if available), and FLIP IAP books prior to departure. In some cases, the only information about departure routings and restrictions is in the front of the IAP book. The pilot will ensure the FE has all available information necessary for performance computations (i.e., obstacle height, distance, and gradient).

6.12.2.1. Trouble “T” Symbol. A black inverted triangle with a white "T" symbol is used to alert aircrews to non-standard departure requirements. This "Trouble T" symbol may or may not be accompanied by a climb gradient, weather minimums, or a departure procedure. When the "Trouble T" appears on a procedure the crew intends to use, extra caution is required to ensure the pro-

cedure is fully understood and the aircraft is capable of meeting all restrictions. **NOTE:** Jeppesen procedures do not use the "Trouble T" symbol. In order to determine climb restrictions on a Jeppesen procedure you must have both the airfield diagram and the approach pages.

6.12.2.2. Obstacle Identification. Aircrews are not trained to identify departure obstacles, nor do they have sufficiently detailed information to create an IFR departure. The following information is meant to provide a greater understanding of the factors affecting the construction of instrument departure procedures, not to allow crews to create their own. The Obstacle Identification Surface (OIS) for IFR departure purposes is a 40:1 slope (152 ft/nm, or 2.5%) (FAA Handbook 8260.3B; AFJMAN 11-226, *United States Standard for Terminal Instrument Procedures (TERPS)*). This slope is projected from the departure end of the runway (DER, or screen height) until reaching an IFR MEA or until the DP terminates. Climb gradients of 200 ft/nm will provide at least 48 ft/nm clearance above all obstacles that do not penetrate the OIS. Higher climb gradients will provide at least 48 ft/nm clearance above all obstacles that do penetrate the OIS. The AC must be aware and thoroughly brief the crew on all obstacles along the departure flight path.

Figure 6.1. Obstacle Identification Surface.



6.12.2.2.1. The AMC ASRR is an excellent source for obstacle information; however, it is not a stand-alone document. It is intended to supplement published climb gradients and obstacle information found on SIDs, published IFR departure procedures, GDSS/C2IPS, and terrain charts.

6.12.2.2.2. HQ ACC/DORO is the source for additional airfield obstacle data, DSN 574-2971.

6.12.2.3. IFR Climb Gradient Policy. Thoroughly review departure instructions, published or verbal, and aircraft performance data to determine if the aircraft is capable of meeting all restrictions. Both normal and engine-out performance must be calculated (***EXCEPTION***: If engine-out performance meets or exceeds the published minimum climb gradient, it is not necessary to calculate four engine performance). If no minimum climb gradient is published, the aircraft must be capable of climbing at least 200 ft/nm minimum with all engines operating, and 155 ft/nm minimum with one engine inoperative. If a higher climb gradient is required, use that climb gradient as the minimum with all engines operating, and use that climb gradient minus 45 feet/nm as the minimum with one engine inoperative. ***WARNING:*** Pilots must be aware that subtracting 45 feet/nm may reduce the obstacle clearance to zero. When three-engine performance is marginal, crew coordination procedures and actions to be taken (EP checklists, fuel dumping, LBT antenna jettison, etc.) must be carefully thought out and briefed before takeoff. If an engine fails after takeoff, there is little or no margin for error on departure. The risk is even greater in instrument meteorological conditions.

6.12.2.3.1. Engine-out departure procedures have been developed for certain airfields, specific to aircraft type. If a current USAF-approved engine-out departure procedure is available and aircrews are trained to use it, engine-out climb gradient and maximum gross weight restrictions published on this procedure may be used for departure. The aircraft must be capable of meeting or exceeding the IFR climb gradient for the published IFR departure (200 feet/NM if none published) with all engines operating. (Note: Approved engine-out departure procedures provide 35 feet of obstacle clearance over obstacles within 3000 feet of the special engine-out routing).

6.12.2.4. IFR Departure is not authorized when:

6.12.2.4.1. A "Trouble T" symbol is printed on the approach plate or DP, and no climb gradient is published for that runway (departure requires minimum weather), or a climb gradient is required in addition to weather minimums.

6.12.2.4.2. The departure airfield does not have a published instrument approach IAW AFI 11-202V3.

6.12.2.4.3. Aircraft performance does not meet or exceed the requirements of para **6.12.2.3.** In this case, the crew will consider the following in the priority listed below:

6.12.2.4.3.1. Calculate TOLD/aircraft performance using 100 percent engine efficiency, or using drag index for LBT antennae removed (EC-130H). These options require squadron CC/DO (or designated representative) approval. Crews must verify engine efficiency and thoroughly brief responsibilities for and timing of LBT antenna jettison prior to takeoff.

6.12.2.4.3.2. Download fuel.

6.12.2.4.3.3. Delay the mission until climatological conditions allow for sufficient performance to meet the requirements of paragraph **6.12.2.3.**

6.12.2.4.3.4. Coordinate alternate departure procedures that will provide obstacle clearance with the controlling agency. These procedures must comply with AFI 11-202V3 and AFMAN 11-217 guidance regarding IFR departures.

6.12.2.4.3.5. Depart VFR. Comply with para **6.12.3.** below and the following:

6.12.2.4.3.5.1. OG/CC or designated representative approval is required. Conduct an ORM analysis for the VFR departure, and provide this analysis to the approving official.

6.12.2.4.3.5.2. If the crew intends to continue the mission IFR after departure, weather conditions must allow AFI 11-202V3 VFR cloud clearances during climb to an IFR MEA, an appropriate minimum IFR altitude, or a point where it is possible to intercept an IFR departure procedure and comply with all subsequent restrictions.

6.12.2.5. Diverse Departures. At airfields where obstacles are not a factor, but an instrument approach is published, aircrews may fly a diverse departure. A diverse departure means to fly runway heading to 400 ft AGL, then turn to departure heading maintaining a minimum climb of 200 ft/nm to the appropriate IFR MEA. The pilot may turn in any direction after reaching at least 400 ft AGL. A published instrument approach without a "Trouble T" indicates a diverse departure is authorized from that airfield, unless diverse departures are specifically prohibited in the front of the FLIP IAP book.

6.12.3. VFR Departures. Comply with AFI 11-202V3, paragraph 8.1.

6.12.3.1. VFR departures require detailed planning to ensure the aircraft is capable of avoiding obstacles and high terrain. The AC, with the assistance of the crew, is solely responsible for determining obstacle clearance requirements for a VFR departure. The crew should conduct an Operational Risk Management (ORM) review as part of the planning process. Consider factors such as weather, surrounding terrain, proximity of obstructions, etc. ***NOTE:*** Charts available to aircrews (TPC, JOG, etc.) may not accurately depict all obstacles (trees, power lines, towers, etc.) around the airfield 200 ft AGL and higher due to chart scale and feature density. Portrayed obstructions may be as much as 2 to 3 miles from each other with an unknown number of uncharted obstacles in between which are almost as high. Charts must be updated with the latest obstacle data via NOTAMs and CHUM to provide the most complete picture of obstacles in the vicinity of the airfield. Pilots must use extreme caution when departing VFR with marginal aircraft performance.

6.12.3.2. Conduct VFR operations only when required for mission accomplishment. Do not conduct VFR operations at night. OG/CC approval is required for VFR operations during civil twilight.

6.12.3.3. The planned departure and emergency return routes will be thoroughly briefed to the entire crew. Escape routing must always be planned to ensure obstacle clearance and emergency recovery in the event of engine failure. Emergency recovery altitudes must be planned to avoid creating undue hazard to persons or property IAW 11-202V3, para 5.10.

6.12.3.4. Four-engine climb performance (climb gradient capability) must ensure obstacle avoidance along the planned departure route, as determined by a review of VFR charts. In the opinion of the AC, available charts must provide sufficient detail to identify obstacles which may be a factor on takeoff. The chart updating requirements and accuracy considerations of paragraph **6.12.3.1.** above apply.

6.12.3.5. Engine-out climb performance (climb gradient capability) must ensure that in event of an engine failure, the planned departure or emergency return route (which may be different than the planned departure route) provides obstacle avoidance. Even when obstacles are not a factor, the aircraft must be capable of maintaining a climb rate of at least 100 ft/nm during the

three-engine climb out profile. Emergency recovery altitudes must be planned to avoid creating undue hazard to persons or property IAW 11-202V3, para 5.10.

6.13. Takeoff Minimums. Takeoff minimums are according to **Table 6.3.**

6.13.1. OG/CC or equivalent must approve takeoff if departure alternates are required.

Table 6.3. Departure Alternate Requirements.

If departure weather is:	A departure alternate is:
At or above authorized ceiling and visibility landing minimums.	Not required
Below either authorized ceiling or visibility minimums but RVR is 16 or greater (visibility ¼ miles or greater):	Required (see notes 1 and 2)
Below either authorized ceiling or visibility minimums but RVR is 12 or greater at the approach end and 10 or greater at the departure end and runway centerline lighting is operational:	Required (see notes 2 and 3)

Notes:

1. Alternate must be located within 30 minutes flight time with weather reported and forecast at or above approach minimums or 200-1/2 (RVR 24), whichever is higher for 1 hour after takeoff.

-OR-

Alternate must be located within 2 hours flight time with weather to be at least 500-1 above approach minimums but no lower than 700-2 for a precision approach or 800-2 for a non-precision approach for ETA at the alternate + or - 1 hour.

2. Aircraft must be able to maintain MEA to the alternate if an engine fails.

3. Must have centerline lighting and dual RVR display slave readouts for both approach and departure end of runway. For runways with triple RVR readouts, the pilot may use any two consecutive read-outs to determine if the runway is usable for departure (aircraft performance permitting). For example: Approach end RVR=8, midfield RVR=12, departure end RVR=10. If aircraft performance and runway length will permit taking off at midfield, this runway is usable for takeoff.

6.14. Destination Alternate(s). Destination alternate requirements are IAW AFI 11-202V3 except as follows:

6.14.1. File two alternates when the forecast surface winds, prevailing or intermittent, exceed crosswind limit corrected for RCR, or when operational necessity dictates filing to a destination where the forecast visibility, prevailing or intermittent, is less than published for an available approach.

6.14.2. File an alternate whenever the destination is outside the CONUS. **EXCEPTION:** Intra-theater flights outside CONUS that do not exceed 3 hours, comply with basic AFI 11-202V3.

6.14.3. If the destination is remote or an island, with no alternate available, add holding fuel in accordance with **Table 14.1.** in lieu of an alternate. The forecast weather at the remote or island destination must meet the following restrictions:

6.14.3.1. Prevailing surface winds, with RCR correction applied, must be within the "recommended" or "caution" areas of the crosswind charts at ETA and remain so for 2 hours thereafter.

6.14.3.2. Prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach (excluding ASR) for ETA plus 2 hours. If a precision approach is available, the ceiling or visibility may be temporarily or intermittently below non-precision approach minimum (excluding ASR) but not below precision approach minimums.

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

6.15.1. During flight, use any means available to avoid thunderstorms by at least:

6.15.1.1. 20nm at and above flight level (FL)230.

6.15.1.2. 10nm below FL 230.

6.15.1.3. Do not fly directly above thunderstorms (within 2000 feet). Avoid them using the above criteria.

CAUTION: Aircraft damage may occur 20 miles or more from any thunderstorm. Aircrews must familiarize themselves with information on thunderstorm development and hazards. Refer to AFH 11-203V1, *Weather for Aircrews*.

6.15.2. 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:

6.15.2.1. Changing routing.

6.15.2.2. Diverting to alternate.

6.15.2.3. Declaring an emergency and requesting priority assistance.

6.15.3. In order to minimize exposure to thunderstorm hazards when approaching or departing an airport in an area where thunderstorms are occurring or are forecast, comply with the following:

6.15.3.1. Attempt to maintain VMC. The aircraft must not be flown below thunderstorms, cumulonimbus clouds, or through the rain shaft associated with these clouds.

6.15.3.2. Maintain at least 5nm separation from heavy rain showers.

6.15.3.3. Avoid areas of high lightning potential, i.e., clouds within plus or minus 5,000 feet of the freezing level, light precipitation, or light turbulence.

6.15.3.4. Increase the distance from the thunderstorm or CBs as soon as possible after takeoff to meet the criteria in paragraph **6.15.1.**

6.15.3.5. A missed approach course from the missed approach point must be available which will provide separation similar to that for departures.

6.15.3.6. An emergency return route or a clear route to a departure alternate is available.

NOTE: Approaches or departures may be accomplished when thunderstorms are within 10nm. The thunderstorms must not be producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and must not be forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

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

6.15.5. Significant Meteorological Information (SIGMET) 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.

6.15.6. The following conditions are most favorable for lightning strikes, and prolonged flight in them should be avoided when feasible:

6.15.6.1. Within 5,000 feet of the freezing level.

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

Section 6C—Preflight/Ground Operations

6.16. Briefings:

6.16.1. Conduct mission briefings prior to all flights. 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. Briefings should be clear, concise, and designed to provide mission essential information. Units will develop mission briefing guides which should include, but are not limited to, the following:

description and purpose of the mission,

itinerary,

aircraft configuration/special equipment,

fuel load,

clothing required,

MAJCOM/NAF/OG Special Interest Items,

training/evaluation requirements (if applicable),

flying safety,

intelligence.

6.16.2. Operations Officers or DETCOs are responsible for ensuring all crews are briefed on Buffer Zone, SAFE PASSAGE, and theater-specific requirements, as appropriate.

6.16.3. Crewmembers will not fly unless they attend the crew briefings for their mission. **EXCEPTION:** ACs may excuse FEs or AMTs/Scanners from briefings to perform preflight duties, but will ensure those personnel are briefed on pertinent information prior to engine start.

6.17. Call Signs:

6.17.1. Local Training Missions. Aircraft will use unit assigned, static call sign prefix followed by a two-digit suffix.

6.17.2. Off-Station/Operational Missions. Use call signs assigned by OPORD, ATO, or diplomatic clearance. If no call sign has been assigned, use Voice Call Sign Listing (VCSL).

6.18. AFTO Form 781, Aerospace Vehicle Flight Data Document. Review AFTO Form 781 before applying power to the aircraft or operating aircraft systems. The 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 (except for a Red X). Ensure that a valid Air Force fuel identiplate is aboard the aircraft before departure.

6.19. Aircraft Servicing and Ground Operations:

6.19.1. Aircrew Dash-1 Preflight Inspection Requirements. The aircrew dash one preflight inspection, once completed, will remain valid until either:

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

6.19.1.2. Another maintenance Dash-6 preflight is performed.

6.19.2. Preflighted Spares. 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.

6.19.3. Aircraft Refueling. Aircrew members, qualified in refueling, may perform refueling duties at austere locations or at stations without maintenance support. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-72 and refueling job guide. Crewmembers may augment maintenance refueling teams at en route stops.

6.19.3.1. Aircrew members may perform concurrent ground operations (maintenance operations or other actions during refueling or defueling) IAW T.O. 00-25-172.

6.19.3.2. Hot refueling will only be conducted by crews authorized and certified IAW AFI 11-235, *Forward Area Refueling/Rearming Point (FARRP) Operations*.

6.19.4. Aircrew and Maintenance Engine Run-ups:

6.19.4.1. 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:

6.19.4.1.1. 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.

6.19.4.1.2. Use flight crew Dash-1 checklists. Begin with the "cockpit" checklist and complete all appropriate checklists through the "before leaving the airplane" checklist.

6.19.4.1.3. Deviate from the flight crew checklist only when maintenance requires less than four engines to be started. 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. ERO procedures apply (see para **17.5.**).

6.19.5. 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.

6.19.6. Fire Protection and Crash Rescue:

6.19.6.1. Aircraft will not be operated into or out of airfields unless crash rescue coverage is available (**EXCEPTION:** Combat/contingency operations as directed by authority with OPCON of aircraft). The aircraft engine fire extinguisher system fulfills the minimum requirements for fire protection during engine start.

6.19.6.2. A fireguard is required for all engine starts including the GTC. The AMT/Scanner or ground controller may act as fireguard.

6.20. Life Support Requirements:

6.20.1. Oxygen. Aircrew members will comply with the oxygen requirements specified in AFI 11-202V3. 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 each system with all walk-around bottles filled).

6.20.1.1. Since the EC-130 flight deck can accommodate more aircrew members than there are oxygen regulators, all EC-130 aircraft will have three emergency escape breathing devices (EEBD) or passenger oxygen kits (POK) permanently pre-positioned on the aircraft. However, EEBDs and POKs will not be used to satisfy inflight oxygen requirements outlined in AFI 11-202V3.

6.20.1.2. Do not remove the pilot, copilot, or AMT/Scanner emergency equipment (quick don/smoke mask) for use by other aircrew members or passengers.

6.20.2. Rafts . On over water flights, do not carry more passengers and aircrew members than wing well life rafts will accommodate.

6.20.3. LPUs. The AMT/Scanner will place an LPU within easy reach of each seated passenger prior to takeoff for over water flights. Life preservers will be worn whenever below 2,000 feet over water. (**EXCEPTION:** LPUs need not be worn for takeoffs, landings, or approaches if these are the only over water portions of the flight).

6.20.4. Parachutes:

6.20.4.1. Parachutes will be carried on aircraft at all times IAW AFI 11-301, *Aircrew Life Support (ALS) Program*.

6.20.4.2. Personnel performing duties near an open door in-flight will be restrained by harness, or be wearing a parachute. During training and confidence activities, all personnel not seated will use a restraining harness.

6.20.5. Life Support Equipment Documentation. The AC or designated representative will, prior to departing home station, review the AFTO Form 46, **Prepositioned Life Support Equipment**. Standard preflight requirements will suffice for inventories at en route stops when the crew does not change. Do not open sealed bags just to count equipment. Check attached tag on sealed bags for type and quantity of equipment and inspection currency.

6.21. Military Customs Pre-clearance Inspection Program. All aircrew members will ensure compliance with Military Customs Pre-clearance requirements. See paragraph **6.42.**

Section 6D—Departure

6.22. Reduced Power Operations. Takeoffs will normally be made using reduced power, conditions permitting.

6.23. C-130 Takeoff and Landing Data (TOLD) Cards:

6.23.1. The FE will complete TOLD cards, according to **Chapter 12** of this volume and TO 1C-130H-1-1. Pilots and copilots will use Mini TOLD Card. A pilot aircrew member, or additional FE, will crosscheck the TOLD card for accuracy by using the performance manual or approved tabulated data. As a minimum, the person checking the data will:

6.23.1.1. Verify gross weight independently from the FE's TOLD card.

6.23.1.2. Crosscheck air minimum control (one engine inoperative in ground effect), takeoff, and landing speeds.

6.23.1.3. Check data for the initial takeoff, landing, and for significant changes in operating conditions.

6.23.2. When performance is critical, review and compare the computed distances and ground roll with the actual conditions and runway available.

6.24. Passenger Eligibility. EC-130E/H aircraft are passenger-type aircraft, but are not configured to routinely carry passengers. Personnel not qualified as crewmembers or granted MEGP status (i.e., public affairs and media personnel) require approval IAW AFI 11-401, *Flight Management*, as supplemented. Security clearances must be appropriate for the sortie to be flown, and verified by the proper authority. Do not perform simulated emergencies or touch-and-go landings with passengers on board.

6.25. On-Time Takeoffs. In general, departures are considered "on time" if the aircraft is airborne within 30 minutes of the scheduled takeoff time. However, the aircraft commander, in coordination with the MCC/DABS, may adjust departure time outside this window if necessary to meet mission requirements.

Air traffic control restrictions, air refueling control time, on-station time, and weather are some, but not all, of the factors which may require early or late departure.

6.26. Departure Monitoring. The navigator and pilot not flying the aircraft will back up the pilot and report any deviations from the planned departure. When radar facilities are available, request a radar monitored departure at night or when the airport is operating under IFR.

Section 6E—En route

6.27. Flight Progress:

6.27.1. Prior to an oceanic flight, plot the oceanic portion of the flight on an appropriate chart. Annotate the chart with the mission number, preparer's name, and date. If practical, chart may be reused.

6.27.2. Anytime waypoint data is inserted into the SCNS/INS, it will be verified. Check both the coordinate information and the distances between waypoints against the flight plan.

6.27.3. In-flight, use all available navigational aids to monitor SCNS/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:

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

6.27.3.2. Approximately 10 minutes after passing each oceanic waypoint, record and plot the aircraft position and time on the chart, and ensure compliance with courses and ETA tolerances.

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

6.27.4. US military aircraft and DoD personnel entering another nation to conduct US government business therein 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). See FLIP, Foreign Clearance Guide (FCG), and AP for further guidance.

6.27.4.1. 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.

6.27.4.2. Consistent with international law, the US recognizes sea claims up to 12nm. 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 12nm; however, specific guidance from certain US authorities may establish limits, which differ from the standard.

6.27.4.3. A Flight Information Region (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.

6.27.4.4. 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).

6.27.4.5. 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.

6.27.4.6. 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.

6.27.4.7. In the event ATC agencies challenge the validity of a flight routing or attempt to negate existing clearances, pilots must evaluate the circumstances and take action appropriate to the situation. The normal response is 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 prior to mission departure, as being valid authorization.

6.27.4.8. Aircrews operating missions requiring unique or specially developed routing will normally be briefed at home station, en route station, and/or by the last C2 facility transited prior to performing the critical portion of the mission.

6.27.4.9. Aircrews normally are not tasked to and should not fly "due regard" routings unless specifically directed in the OPORD, DEPORD, or ATO. The "due regard" or "operational" option obligates the crew to be their own ATC agency, and to separate their aircraft from all other air traffic. If operational requirements dictate, ACs may exercise the "due regard" option to protect their aircraft. When the threat has terminated, the aircraft will return to normal air traffic services.

6.28. Navigational Aid Capability:

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

6.28.1. North Atlantic MNPS airspace and PACOTS, NOPAC, and Hawaiian Track procedures are as follows:

6.28.1.1. MNPS standards (FLIP AP/2) are mandatory in North Atlantic MNPS airspace.

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

6.28.2. Reduced Vertical Separation Minima (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-130 is not RVSM compliant at this time, pending future upgrades. However, RVSM only applies above FL 290. Refer to FLIP AP/2 for RVSM requirements.

6.28.3. Required Navigation Performance (RNP) Airspace. Airspace where RNP is applied is considered special qualification airspace. Both the operator and the aircraft must be approved for operations in these areas. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between routes. The EC-130 is approved for RNP operations only with a qualified navigator at the navigator's station, but limited to operational time restrictions based on the navigation equipment.

6.28.3.1. RNP-10. Compliance includes navigation accuracy within 10NM of actual position 95% of the time. Aircraft are limited in how long they may operate in RNP-10 airspace. The EC-130 may operate up to 6.2 hours (after entering the nav mode in SCNS, if applicable) in RNP-10 airspace without an update. If an automatic update (TACAN update) is made, the aircraft may continue for an additional 5.7 hours in RNP-10 airspace after the update is complete. If a manual update (radar update, etc) is made, the aircraft may continue for an additional 5.2 hours in RNP-10 airspace after the update is complete. GPS position may be used to update INS position only after the navigator verifies the accuracy of the GPS position. The following are RNP-10 requirements:

6.28.3.1.1. NOPAC Routes. NOPAC routes require TACAN updates to be RNP-10 compliant. Shemya TACAN must be operational. When abeam Shemya a position crosscheck will be made. If inertial position is more than 3 NM from TACAN fix position, a TACAN update must be accomplished on all inertial units exceeding this limit.

6.28.3.1.2. Flight Planning. Verify aircraft is approved for RNP operation, access mission impact and verify the letter "R" is annotated in block 10 of the DD Form 1801, International Flight Plan.

6.28.3.1.3. Preflight Procedures. Review maintenance logs to ascertain status of RNP-10 equipment and particular attention should be paid to navigation antennas and the condition of the fuselage skin in the vicinity of these antennas.

6.28.3.1.4. En route. The INS/SCNS must be operational at the oceanic entry point. Operational GPS is desired, but not required. Prior to entering Oceanic Airspace, the aircraft's position should be checked as accurately as possible by using external navigation aids (coast-out fix). Periodic crosschecks will be accomplished to identify navigation errors and prevent inadvertent deviation from ATC cleared routes. Advise ATC of the deterioration or failure of navigation equipment below navigation performance requirements and coordinate appropriate actions.

6.28.3.1.5. RNP Required Equipment Malfunction/Failure. Document (in the aircraft forms) malfunctions or failures of RNP required equipment, including the failure of this equipment to meet RNP tolerances.

6.28.4. Basic Area Navigation (BRNAV) Airspace. Airspace where BRNAV is applied is considered special qualification airspace. Both the operator and the aircraft must be approved for operations in these areas. BRNAV navigation accuracy is equal to RNP-5 (navigation accuracy within 5NM of actual position 95% of the time) criteria. The EC-130 is approved for BRNAV operations only with a qualified navigator at the navigator's station. The navigator must update the INS, manually or automatically, with a TACAN every 2 hours to maintain actual centerline within +/-5 NM of ATC cleared route. GPS updates may be used, provided the navigator can verify the GPS position.

6.28.4.1. Minimum equipment to operate in BRNAV airspace is one INS capable of updates. Flights entering BRNAV airspace after long over water flight must be especially aware of BRNAV tolerances and update accordingly.

6.28.4.2. Aircraft unable to maintain BRNAV tolerances must advise ATC immediately and take appropriate coordinated action.

6.28.4.3. Document (in the aircraft forms) malfunctions or failures of BRNAV required equipment, including the failure of this equipment to meet BRNAV tolerances.

6.29. CIRVIS and Other Reports. Report all vital intelligence sightings from aircraft as indicated in FLIP planning or FLIP En route Supplement.

6.29.1. 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; 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.

6.29.2. Other incidents will be reported as indicated in JCS Pub 6V5 and AFMAN10-206, *Operational Reporting*.

6.30. In-Flight Meals. The pilot and the copilot should not eat meals at the same time, and their meals should consist of different menu items.

6.31. Communications:

6.31.1. HF Radio Ground Check. Perform an HF radio ground check prior to takeoff if the use of HF radio may be required for ATC or C2 communications. Establish HF contact before going out of UHF and VHF range. If unable to establish HF contact with the controlling HF station, and an alternate means of relay of ATC information in oceanic areas is not available, return to the nearest suitable support base.

6.31.2. General. Provide ARTCC position and weather observations when required. If unable to contact an ATC agency, attempt relay through the GLOBAL HF stations.

6.31.3. AF Form 72, Air Report (AIREP). When directed by departing weather facility, take and record an AIREP at each position report over a Category I Route. Identify inaccurate CFP winds by special report if the average wind for a route segment exceeds either 30 degrees error in wind direction or 25 knots in wind speed. Turn in completed AF Form 72 to the destination USAF weather facility.

6.32. In-Flight Emergency Procedures. Report deviations from directives that may occur as a result of an emergency according to AFI 11-202V3.

6.32.1. Notification of Controlling Agencies. When practical after completing the aircraft emergency action checklists and associated actions, crews should furnish the controlling agency and appropriate C2 agencies with a description of the difficulty, assistance required, intentions, and any other pertinent information.

6.32.2. CONFERENCE SKYHOOK. A CONFERENCE SKYHOOK may be initiated when additional expertise is necessary to cope with emergencies or other conditions. Communications procedures are as follow:

6.32.2.1. When in the local area (UHF or VHF range), initiate the conference over appropriate frequencies.

6.32.2.2. En route, when out of UHF range, use HF radios to establish a phone patch with the nearest or controlling C2 center as appropriate.

6.32.2.3. Provide the following information when time permits.

6.32.2.3.1. Narrative description of the situation to include actions taken by the crew and the intentions of the AC.

6.32.2.3.2. What assistance is being requested

6.32.2.3.3. Fuel on board and hours of endurance.

6.32.2.3.4. Position.

6.32.2.3.5. Altitude and flight conditions.

6.32.2.3.6. Number of personnel and distinguished visitors (DV) on board.

6.32.2.3.7. Qualification of AC.

6.32.2.3.8. Planned landing base.

6.32.2.3.9. ETA at landing base.

6.33. Need for Medical Assistance. When a person aboard the aircraft requires medical care, inform the station of intended landing in sufficient time so medical personnel may meet the aircraft. Include the patient's sex, approximate age, and the major complaint in the request.

Section 6F—Arrival

6.34. Weather Forecasts:

6.34.1. It is the pilot's responsibility to obtain destination weather prior to descent.

6.34.2. 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.

6.34.3. 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).

6.34.4. The ATC system can provide weather information to en route 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.

6.34.4.1. 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.

6.35. Crew Coordination. Aircrew members will confine their activities to aircraft operation below 10,000 feet.

6.36. Instrument Approach Procedures:

6.36.1. Only DoD FLIP and NOAA published approaches are authorized for use. Submit requests to MAJCOM Standardization/Evaluation for use of other instrument procedures (e.g., Jeppesen/host nation procedures).

6.36.2. If the minimum altitude is not adequately depicted on an instrument approach procedure chart and terrain clearance is not confirmed by ATC radar, continue to the initial approach fix at or above the minimum altitude depicted on the en route chart and complete the descent to the initial approach altitude in a holding pattern.

6.37. Instrument Approach Minimums. The EC-130 is a category "C" aircraft. If approach speeds exceed 140 knots, the minimums for category "D" will be used. DH/MDA, instrument approach visibility and, if required, ceiling minimums will be as published, with the following Exceptions:

6.37.1. Precision Approaches. Minimum visibility is one-half mile or RVR 24. DH will be based on a HAT of no less than 200 feet.

6.37.1.1. If full flight instrumentation is not operational, visibility must be at least three-fourths of a mile (RVR 40), and/or ceiling must be at least 300 ft. Base DH on a minimum HAT of 300ft.

6.37.1.2. Full flight instrumentation for an ILS includes dual flight displays, (one flight director plus ADI repeat satisfies this requirement), complete differential pressure instruments, compass system/heading reference systems, and attitude indicators in the pilot and copilot positions.

6.37.1.3. Full flight instrumentation for a PAR includes complete differential pressure instruments, compass systems/heading reference systems, and attitude indicators in the pilot and copilot position.

6.37.2. Non-precision Approaches. Use published minimums.

6.37.3. Circling Approach. Minimum descent altitude (MDA) will be as published for category aircraft, but in no case lower than the value indicated below, plus the published airport elevation:

6.37.3.1. Category C. 500 feet, 1.5 miles.

6.37.3.2. Category D. 600 feet, 2 miles.

6.37.4. Aircrews performing approaches and landings at locations where temperatures are 0 degrees centigrade or below will refer to the Flight Information Handbook, section D, Temperature Correction Chart, to correct minimum descent altitude (MDA), decision height (DH), and other altitudes inside the final approach fix (FAF) if required.

6.38. Weather Below Minimums. If the ceiling is below the value depicted for the approach but the visibility value is at or above the authorized minimums, the pilot will comply with the fuel requirements of **Table 14.1.** prior to initiating en route descent or penetration and approach.

6.38.1. An AC may hold at a destination which is below landing minimums but forecast to improve to-or-above minimums, fuel permitting.

6.38.2. If advised that weather conditions are below landing minimums after starting an approach, comply with AFI 11-202V3. The AC may elect to continue the approach to the missed approach point.

6.39. Wake Turbulence Avoidance. Comply with wake turbulence avoidance criteria. Acceptance of a visual or contact approach clearance or instructions to follow an aircraft is acknowledgment that the pilot will maintain a safe interval for wake turbulence avoidance.

Section 6G—Post-Flight

6.40. Aircrew Debriefing. Debrief all missions IAW local **Chapter 10**.

6.41. Customs, Immigration, and Agriculture Inspections:

6.41.1. Obtain Customs, Agriculture, and Public Health clearance, as required, prior to opening any doors (other than the crew entrance door) or enplaning and deplaning personnel.

6.41.2. Proceed directly from the aircraft to Customs, Immigration, or Agricultural Inspection for processing at those stations where Federal or local inspections are required. The AMT/Scanner or the AC completes the necessary forms before reporting to inspectors.

6.41.3. After clearing with border clearance agencies, the AMT/Scanner returns to the aircraft for post-flight procedures.

6.41.4. All aircrew members will obey foreign or host country laws and customs as prescribed in the FCG.

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

6.41.5.1. ACs will not permit the inspection of their aircraft by officials of any foreign government. If requested to do so, the AC and crew will deny access and seek aid from the senior USAF representative or US Embassy or consulate within the host nation. Customs or other officials will be informed of the above policy and requested to confirm their request through their own government and with US Department of State representatives. If necessary, the crew will seal the aircraft enter crew rest, and cancel departure intentions until resolution of the matter by appropriate authority. Communications by the fastest means available will be used to inform command and control facilities should this situation occur.

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

6.41.5.2.1. In most cases, search attempts may be stopped by a statement of the AC to the foreign official(s) that the aircraft is a sovereign instrument not subject to search without consent of HQ USAF or the Chief of Mission in the country concerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities who may honestly, but mistakenly, believe they have authority to search USAF aircraft.

6.41.5.2.2. If foreign authorities insist on conducting a search, the AC must negotiate to delay the search until contact is made with HQ USAF/XOXXI or the appropriate US Embassy. The AC should unequivocally state that he has no authority to consent to the search and that he must relay the foreign request to these agencies for decision. The AC should then notify these agencies of the foreign request by the most expeditious means available. Thereafter, the AC should follow instructions provided by the appropriate US Embassy and HQ USAF.

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

6.41.5.2.4. 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 HQ USAF and the appropriate American Embassy of the foreign action. The AC should then allow the foreign agents on board the aircraft, without physical resistance, and thereafter report the incident to HQ USAF and appropriate Embassy as soon as possible.

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

6.41.5.2.6. 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 or aircrew members (AMT/Scanner excepted) unless necessary for safety or the preservation of life and property. Do not offload 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.

6.42. Exercises and Contingency Operations:

6.42.1. 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 ACC, establishes certain procedures and waivers. ADVON personnel, if available, should initiate these procedures prior to aircraft arrival.

6.42.2. 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 CONUS on-load or off-load base instead of the normal APOE, or at the foreign on-load or off-load base.

6.42.3. Customs Procedures:

6.42.3.1. Outbound. No requirement. Filing of Customs Form 7507, **General Declaration (Outward/Inward)** is waived.

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

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

6.42.3.2.2. Cargo manifest (if applicable).

6.42.3.2.3. One copy of the US Customs Baggage Declaration Form for each passenger and aircrew member.

6.42.3.3. Arrival. Upon arrival at a CONUS offload base, a Customs representative will meet the aircraft and collect all declarations.

6.42.4. Public Health Procedures:

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

6.42.4.2. Spray the aircraft if required.

6.42.4.3. When carrying agricultural products/equipment, comply with the following**:**

6.42.4.3.1. Outbound. No requirement.

6.42.4.3.2. Inbound:

6.42.4.3.2.1. The ACs will instruct aircrew members and passengers that no fresh fruit, vegetables, plants, plant pests, soil samples, animals, meat, and animal products can be brought into the United States. Personal gear and equipment must be examined for snails and other plant pests to prevent their accidental entry into the US.

6.42.4.3.2.2. Before loading, the command responsible for cargo being airlifted will clear vehicles and cargo of snails or other plant pests and of all mud and soil.

6.42.4.3.2.3. When required by agricultural quarantine instructions, FCG, or higher headquarters, aircraft will receive an aerosol treatment a minimum of 30 minutes prior to landing.

6.42.4.3.2.4. Inspectors examine baggage, equipment, and cargo as offloaded. Any items found to be contaminated will be held for such treatment as the inspector may direct (washing, steam cleaning, physical cleaning, or fumigation).

6.43. Insect and Pest Control (Aircraft Spraying):

6.43.1. ACs will ensure spraying is accomplished, when required. Spray IAW AFJI 48-104, *Quarantine Regulations of the Armed Forces*, DoD 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.

6.43.2. Spray the aircraft immediately before the last takeoff prior to entering:

6.43.2.1. The US or its possessions from a foreign airport between 35 degrees north and 35 degrees south latitude (Japan excluded and all of Africa included).

6.43.2.1.1. Aircraft that land in the US north of 35 degrees north latitude need not be sprayed between 1 October and 31 March, unless the aircraft will immediately proceed to a part of the US located south of 35 degrees north latitude.

6.43.2.1.2. The US Public Health Service may require spraying of aircraft for emergency purposes or special requirements (see USAF Foreign Clearance Guide for exceptions).

6.43.2.2. The state of Hawaii, to include flights from the CONUS.

6.43.2.3. A foreign area, according to the requirements of the country concerned or of the USAF. (See USAF Foreign Clearance Guide for individual country requirements.)

6.43.3. Use insecticide, Aerosol D-Phenotrin-2%, NSN 6840-1-067-6674 (or equivalent), to spray the aircraft.

6.43.3.1. Aerosol normally is dispersed at a flow rate of 10 seconds per 1,000 cubic feet. Direct the nozzle toward the ceiling of the compartment or space being sprayed. Do not spray any plastic surface or allow the spray to wet it.

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

6.43.3.3. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is on board and after closing all doors, windows, hatches, and ventilation openings.

6.43.4. Spray for 50 seconds unless longer periods are specified for the country being transited.

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

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

6.43.7. The US Public Health Service may require spraying of aircraft for emergency purposes or special requirements (see USAF FCG for exceptions).

Section 6H—Miscellaneous Procedures

6.44. Aircraft Pushback Operations. In situations where aircraft backing cannot be performed and time constraints and/or adverse weather prevent ground personnel from pre-positioning the aircraft, aircrew members may be required to participate in aircraft pushback operations. Comply with the requirements in paragraph **6.40.** above. Following pushback, chocks will be installed prior to disconnecting the tow bar and the FE will deplane to inspect the nosewheel scissor connection. Commence with BEFORE STARTING ENGINES checklist. **NOTE:** If a Dash-1 preflight was performed and no bleed down was performed, it should be accomplished at this time.

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

6.45.1. This release must be authorized by the OG/CC, the senior maintenance officer, or the chief of the ALC repair team and requires NAF/DO coordination.

6.45.2. After the maintenance release is obtained, coordinate mission requirements with the controlling agency.

6.45.3. The AC's concurrence is required before the aircraft can be flown.

6.46. Buddy and Windmill Taxi Starts. Buddy and windmill taxi starts may be performed when approved by the wing/group commander or equivalent. Wing or group commanders may delegate this authority to their squadron or DETCO when the unit is deployed. This authorization will not be construed to allow repeated buddy or windmill starts at various scheduled en route stops. Nonessential aircrew members and all passengers will be loaded after completion of a buddy or windmill taxi start.

6.47. Three-Engine Takeoffs. Actual engine-out takeoffs require authorization from NAF/CC on a case-by-case basis.

6.48. Volcanic Ash Precautions. Do not conduct operations in the general area of volcanic activity unless specifically directed. Volcanic dust may extend for several hundred miles, so flights should be planned well clear of the area and, if possible, the flight path should be on the upwind side of the volcanic dust. If volcanic dust is encountered, serious damage to aircraft surfaces, engines, windshields, and pitot/static systems may occur. Aircraft which have encountered volcanic dust will not be cleared to fly until suitable maintenance inspections have been accomplished. The following is additional aircraft manufacturer recommendations if encountering volcanic ash:

6.48.1. Recommended Flight Procedures. Immediately reduce throttles to idle, exit ash as quickly as possible (180 degree turn recommended), switch on engine and wing anti-ice, set all air conditioning packs on high, put on oxygen masks at 100% (if required), turn on ignition (if applicable), monitor TIT limits, airstart engine (if required), monitor airspeed and pitch attitude, and land at the nearest suitable airport.

6.49. Impoundment. If an aircraft is involved in a serious in-flight incident, the AC should impound the aircraft immediately after landing and contact the controlling C2 for further instructions.

6.50. AN/ALE 47 Ordnance Procedures. Conduct the following procedures after the live firing of chaff/flares on the EC-130E attached C-130 aircraft:

6.50.1. After landing, taxi to the de-arm area or another suitable safe location to check for hung ordnance. A protruding or partially ejected chaff/flare cartridge identifies AN/ALE-47 hung ordnance.

NOTE: ALE-47 or flare squibs that fail to fire are NOT considered hung ordnance.

6.50.2. The AMT/Scanner will de-plane through the paratroop doors wearing eye protection or a helmet with visor down to check all dispensers for hung ordnance. Interphone contact will be maintained at all times. The forward dispensers will be checked (as best as possible) from the rear of the aircraft

6.50.3. If hung ordnance is found, the aircraft will remain in a de-arm area until EOD/Weapons personnel meet the aircraft. The aircraft must remain in the designated safe area until munitions personnel can clear all hung ordnance.

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

6.50.5. Following mission completion, EOD/Weapons personnel will reconfigure the aircraft, to include offloading any remaining chaff/flares or reloading chaff/flares for the next sortie.

6.51. Confidence Activities:

6.51.1. Confidence activities (inflight opening of paratroop doors or ramp and cargo door) are required for AMT/Scanner and FE training to prepare for emergency procedures. Conduct confidence activities IAW the Pilot and AMT/Scanner Inflight Guide(s). Only AMT/Scanner and FEs 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.

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

6.51.3. A safety observer (FE or AMT/Scanner) will be present during all confidence activities and will have a second restraint harness on and fitted.

6.51.4. 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/Scanner/Engineer to fall outside the aircraft.

6.51.5. If the ABCCC capsule is installed, use the capsule floor tiedown ring closest to the paratroop door being opened.

6.51.6. If the ABCCC capsule is not installed and mission equipment is not in the way, connect the hook to tiedown ring 26D to secure the restraint harness.

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

NOTE: Do not use the flight deck restraint harness for confidence activities.

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter and AFI 31-301, *Air Force Installation Security Program*, provide guidance for aircraft security and unlawful seizure of aircraft. EC-130E/H aircraft are normally priority C assets, but become priority B assets when mission information or crypto is loaded in the aircraft systems.

7.2. Security. See AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking)*; AFI 10-1101, *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 above.

7.3.2. En route Security. ACs will receive a threat assessment and security capability evaluation briefing at home station and receive updates at en route 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. Coordinate with local base operations on procedures for servicing the aircraft while the crew is away. If forced entry is apparent, notify the local authorities and nearest C2. Inspect the aircraft thoroughly.

7.4. Arming of Aircrew Members. Due to the nature of the EC-130 mission, crews will not normally be armed en route to a forward operating location. However, weapons may be carried on the aircraft for use in theater. When the OG/CC determines the nature of the deployment warrants the aircrew carry weapons en route, follow the procedures in paragraph **7.4.1.** below.

7.4.1. Weapons Issue. When required by Rules of Engagement (ROE), Air Tasking Order (ATO), or Special Instructions (SPINS), obtain weapons and ammunition from the weapons storage area.

Present a current AF Form 523, **USAF Authorization to Bear Firearms**, for weapon issue. The same weapon will be reissued until the mission terminates. If an armed aircrew member must leave the crew en route, transfer the weapon to another authorized aircrew member using AF Form 1297, **Temporary Issue Receipt**.

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 the survival equipment, in accordance with theater directives. Procedures for weapons issue will be determined by squadron commander/DETCO in conjunction with life support personnel.

7.4.2.2. Do not wear weapons off the flight line except to and from the squadron area/briefing facility. Carefully consider the need to enter other facilities associated with aircrew activities (e.g., base operations, fleet service, cargo and passenger terminals, flight line cafeteria or snack bar), and avoid doing so, if possible. Consider storing weapons with life support while visiting these facilities. Weapons will remain under the positive control of the crewmember at all times.

7.5. Preventing and Resisting Hijacking. Refer to AFI 13-207 for detailed guidance. Security operations surrounding EC-130 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. In the case of an aircraft carrying passengers, the primary concern is the safety of the passengers.

7.5.10. Render assistance to hijacked civil or military contract aircraft as requested by the pilot in command of the aircraft and the authority exercising operational control of the anti-hijacking effort.

7.5.10.1. Responsibilities. When tasked for surveillance operations, the crew will:

7.5.10.1.1. Immediately after launch, establish radio contact with the C2 center via HF.

7.5.10.1.2. Rendezvous with the hijacked aircraft for surveillance as soon as possible after takeoff.

7.5.10.1.3. During rendezvous with the hijacked aircraft, assume a trail position out of cockpit and cabin view. Remain in an unobserved position unless otherwise directed. Safety is paramount; therefore, aircraft will maintain a 10NM trail in Canadian airspace and 5NM trail in all other airspace.

7.5.10.2. After direction to assume surveillance mission, continue until:

7.5.10.2.1. Fuel state dictates aborting to arrive at alternate with fuel reserves specified in this AFI.

7.5.10.2.2. Recalled by the C2 agency.

7.5.10.2.3. The hijacked aircraft's destination is determined to be a country requiring over flight clearance for the surveillance aircraft. Contact a C2 center or command post for further direction. Until directed to over-fly sovereign airspace, remain out of that countryís territorial airspace as specified in the FCG.

7.6. Armed Passengers. EC-130 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. If guards or couriers must clear their weapons, the AC will ensure the individual:

7.6.1. 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. 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-130 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.

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 facing a hijacking threat will notify ground agencies by any means available as soon as practical and follow-up with situation reports as circumstances permit.

7.10.1. If possible, transmit an in-the-clear notification of hijacking to ATC. Controllers will assign IFF code 7500 (does not preclude subsequent selection of code 7700).

7.10.2. If in-the-clear transmissions are not possible, report "am being hijacked" by setting transponder to code 7500. If unable to change transponder code, or when not under radar control, transmit a radio message to include the phrase "(call sign) transponder seven five zero zero."

7.10.3. Controllers will acknowledge receipt and understanding of transponder code 7500 by transmitting "(call sign) (facility name) verify squawking 7500." An affirmative reply or lack of reply from the pilot indicates confirmation and proper authorities are notified.

7.10.4. To report "situation appears desperate; want armed intervention," after code 7500 is used, change to code 7700. If unable to change transponder code to 7700, or when not under radar control, transmit "(aircraft call sign) transponder seven seven zero zero."

7.10.4.1. When changing from code 7500 to code 7700, remain on 7500 for at least 3 minutes or until a confirmation of code 7500 is received from ATC, whichever is sooner, before changing to code 7700. ATC acknowledges code 7700 by transmitting "(call sign) (facility name) now reading you on transponder seven seven zero zero."

7.10.4.2. Aircraft squawking 7700 after squawking 7500, which are not in radio contact with ATC, are considered by ATC to have an in-flight emergency (in addition to hijacking), and the appropriate emergency procedures are followed. Notification of authorities in this case includes information that the aircraft displayed the hijack code as well as the emergency code.

7.10.5. To report "situation still desperate, want armed intervention and aircraft immobilized", leave flaps full down after landing, or select landing flaps while on the ground. To facilitate message distribution, transmit "(aircraft call sign) flaps are full down."

7.10.6. To report "leave alone, do not intervene," retract the flaps after landing. Pilots who retract flaps after squawking 7700 should return to code 7500 and remain on code 7500 for the next leg of the hijacked flight unless the situation changes. Transmit "(call sign) back on seven five zero zero" to emphasize the fact intervention is no longer desired.

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. Transmit the international distress signal, MAYDAY, on any of the international distress frequencies (121.5 MHz, 243.0 MHz, or 2182 KHz) in an effort to establish communications.

7.11.2.5. Set mode 3, code 7700 on transponder.

7.11.2.6. If radio contact cannot be established, follow 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 the possibility of terrorist activities at all times. The following considerations may help crewmembers avoid becoming victims of terrorism when operating in overseas locations:

7.12.1. Personal Conduct. Crews must realize their conduct can make them a target for individuals dissatisfied with US foreign involvement in their national affairs. Local foreign nationals may or may not condone a military presence - crew conduct will be watched and judged. Therefore, utilize the following:

7.12.1.1. Maintain good military bearing both on and off duty.

7.12.1.2. Avoid dressing in clothes that highlight the fact you are an American, i.e., cowboy hats, wide belt buckles, shirts with pro-American slogans, etc.

7.12.1.3. Do not wear clothing displaying profanity.

7.12.1.4. Know where “off-limits” areas are and avoid them.

7.12.1.5. Beware of personnel offering to take you on a “personal” sightseeing tour.

7.12.1.6. Do not get involved with anyone trying to involve you in games of chance.

7.12.1.7. When possible, always travel in groups of two or more.

7.12.1.8. Avoid demonstrations for any cause.

7.12.1.9. Avoid discussion of politics.

7.12.2. Ground Transportation Security. When traveling to and from billeting, messing facilities, etc., consider the following to minimize drawing attention to yourself as a potential target:

7.12.2.1. Select a plain car; minimize the “rich American” look.

7.12.2.2. If possible, consider not using a car that announces Government ownership.

7.12.2.3. Keep the gas tank at least half full at all times.

7.12.2.4. Do a thorough check of the car to look for signs of tampering - look at undercarriage and wheel-wells.

7.12.2.5. Park in well-lighted areas, preferably under US control.

7.12.2.6. Always lock your car. If possible, do not leave it on the street overnight.

7.12.2.7. Only leave the ignition key with parking attendants.

7.12.2.8. Before entering vehicles, check for suspicious objects. Look underneath vehicle seats.

7.12.2.9. Guard against establishing a routine. Vary times, routes, and modes of travel. Avoid late night travel.

7.12.2.10. Travel with companions or in convoys when possible.

7.12.2.11. Avoid isolated roads and dark alleys.

7.12.2.12. Ride with seat belts buckled, doors locked, and windows closed.

7.12.2.13. Do not allow the vehicle to be boxed in. Maintain a large enough interval between you and the vehicle in front so that you can pass.

7.12.2.14. Circle the block for confirmation of surveillance.

7.12.2.15. Do not stop or take other actions, which could lead, to a confrontation.

7.12.2.16. Recognize events that could signal the start of an attack, such as:

7.12.2.16.1. Cyclist falling in front of your car

7.12.2.16.2. Flagman or workman stopping your car.

7.12.2.16.3. Fake police or government checkpoints.

7.12.2.16.4. Disabled vehicle/accident victims on the road.

7.12.2.16.5. Unusual detours

7.12.2.16.6. An accident in which your car is struck.

7.12.2.16.7. Cars or pedestrian traffic that box you in.

7.12.2.16.8. Sudden activity or gunfire.

7.12.2.17. Know what to do if you are under attack:

7.12.2.17.1. Consider sounding the horn.

7.12.2.17.2. Put another vehicle between you or your pursuer.

7.12.2.17.3. Execute an immediate turn and escape, jump curbs at a 30-45 degree angle, 35-mph minimum.

7.12.2.17.4. Ram a blocking vehicle only as a last resort.

7.12.2.17.5. Go to the closest safe haven.

7.12.2.17.6. Report the incident to security police.

7.12.3. Personal Identification. Consider the following actions to avoid advertising the fact you are an American:

7.12.3.1. Donít discuss our military affiliation with strangers.

7.12.3.2. Avoid military style luggage such as B-4 bags & duffel bags with military logos, etc.

7.12.3.3. Consider placing your official passport and related documents such as military ID, flight orders, club card, dog tags, billeting receipts in your hand-carried luggage and not in your wallet or purse.

7.12.3.4. Wear conservative styled civilian clothing when using commercial transportation.

7.12.3.5. Remember, the key is to maintain a low profile.

7.12.4. Hotel Security. When billeted in commercial hotels, crews need to be aware of the following:

7.12.4.1. If possible, obtain rooms between the second and sixth floors. These rooms are high enough to be less vulnerable to unauthorized entry from the outside and low enough to simplify evacuation if necessary.

7.12.4.2. Always lock interior locks when occupying rooms.

7.12.4.3. Always assume your room is monitored and avoid viewing or discussing classified material.

7.12.4.4. Avoid establishing a predictable routine (i.e., vary eating times and locations).

7.12.4.5. Avoid traveling on foot-use a vehicle (hotel shuttle, commercial taxi, etc.).

7.12.4.6. In high threat areas, stay off the streets (use hotel dining facilities if available).

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). See AFI 91-202, Attachment 3, Hazardous Air Traffic Report (HATR) Program (RSC HAF-SE (AR) 7602).

8.3.1. General. The Air Force HATR program provides a means for personnel to report all near mid-air collisions (NMAC) and alleged hazardous air traffic conditions. Use information in HATR reports only for mishap prevention. AFI 91-202 list reportable incidents.

8.3.2. Procedures:

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

8.3.2.1.1. Identification or call sign

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

8.3.2.1.3. Altitude or flight level

8.3.2.1.4. Description of the other aircraft or vehicle

8.3.2.1.5. Include a verbal statement as soon as possible after occurrence that a written HATR report will be filed upon landing

NOTE: ATC agencies (e.g., FAA) must know if an official report is being filed.

8.3.2.2. File the HATR as soon as possible (24 hours) using any available means of communication. Normally, it should be filed at the Air Force base operations office at the landing airport. If this is impractical and if communications permit, notify the safety office of the Air Force base where the condition occurred, the safety office at the home base, or as prescribed by the overseas MAJCOM. In any case, provide the base or wing safety office with all available information needed to prepare AF Form 651. Turn in a completed copy of AF Form 651 to the wing safety office.

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,Safety Investigations and Reports):

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, and OPREP-3.

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. Proven or suspected cases of hypoxia.

8.4.2.2.1.2. Carbon monoxide poisoning or other toxic exposure.

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

8.4.2.2.1.4. Hyperventilation.

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

8.4.2.2.1.6. Loss of consciousness from any cause.

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

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

8.4.2.2.1.9. Alcohol and hangover (crew only).

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

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

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 711GA, Life Sciences Report of an Individual Involved in an AF Accident/Incident, Section A, Aircraft Accident/Incident, 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. Malfunction of landing gear when difficulty is experienced using emergency system or procedures.

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

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

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

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

8.5. Petroleum, Oil, and Lubricants (POL)--Aviation Fuels Documentation. Several different forms are used to record aviation fuels transactions. The form used to record the transaction depends on who and where the actual refueling takes place. Basically, these transactions can be broken down into two categories: refueling at USAF locations and refueling at other than USAF bases:

8.5.1. 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.

8.5.2. Refueling at Locations Other Than USAF Bases:

8.5.2.1. DD Form 1898, AVFuels Into-Plane Sales Slip. This form is used to record the aviation fuels transaction (issue or defuel) at other DoD locations (USA, USN, and USMC) and at commercial airports where into-plane contracts are in force.

8.5.2.2. AF Form 315, United States Air Force AVFuels Invoice. This form is used to purchase aviation fuels and oils at commercial locations where into-plane contracts are not in force. The form is filled-in by the AC or his authorized representative and is described in AFJI 23-206, *Cash Sales of Ground Petroleum Products in Oversea Areas*. If the vendor wants to be paid without submitting an invoice, the AC retains the original AF Form 315 to return to home station for accounting and finance processing. Provide two legible copies of the form to the vendor. If the vendor wants to submit an invoice for payment, give the vendor the original AF Form 315 to attach to the invoice.

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 AF Form 315, United States AVFuels Invoice; and AF Form 15, United States Air

Force Invoice; at locations that accept the AIRcard. All Air Force aircraft will be issued an AIRcard. Additional information at SF WEB page: (**www.kelly.af.mil/sfweb/aircard.htm**).

8.6. AF Form 15, United States Air Force Invoice. Used to purchase ground fuels, oils, or services at non-DoD activities, see AFI 23-202. When completed, log and place inside AF Form 664, **Aircraft Fuels Documentation Log**.

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 identiplate.

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 Canadian into-plane locations will be documented using the local vendor's invoice. AF Form 15 or 315 will not be accomplished. Hand scribe the information from the aircraft identiplate to the vendor's invoice, and complete a separate sheet with the information listed on the Aviation Issues to DoD and Non-DoD, Aircraft Refueling Tender Sheet (See AFI 23-202). Log and place a copy inside the AF Form 664.

8.6.5. Purchases at SITCO Agreement locations require presenting the aircraft identiplate. The invoice must include the date of transaction, grade of the product, quantity issued or defueled, unit of measure, and signature of the Air Force representative. If the vendor also requires completion of 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.

8.6.6. Purchases at non-contract commercial airfields are accomplished using the AF Form 15 or 315. See AFI 23-202 for instructions on completing these forms.

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

Chapter 9

TRAINING POLICY

9.1. General. Aircrew training policy is contained in AFI 11-2EC-130E/HV1.

Chapter 10

LOCAL OPERATING PROCEDURES

10.1. General. Units will publish local and unique unit operating procedures as a supplement to this chapter, commencing with paragraph 10.2. The title of this paragraph will indicate the unit concerned, for example: "355 WG Local Operating Procedures."

10.1.1. Such procedures will not duplicate, alter, or amend the provisions of this volume.

10.1.2. The following items are required by other chapters in this volume:

10.1.2.1. Copilot left-seat training restrictions and approval procedures. (Para **3.1.**)

10.1.2.2. Procedures regarding the use of navigators on proficiency trainers. (Para **3.2.**)

10.1.2.3. Mission debriefing requirements and procedures. (Para **6.40.**)

10.1.2.4. Fuel planning and in-flight fuel management procedures. (**Chapter 11** and **Chapter 14**)

10.1.2.5. Approved VFR ARA approaches, including SCNS ARA input data. (Para **11.11.**)

10.1.2.6. Hostile Environment Repair Kit inventory and issue procedures (Para **12.11.**)

10.1.2.7. Search and Rescue Procedures. (**Chapter 21**)

10.1.2.8. Combat Checklists. (Para **17.6.**)

10.1.3. Additional items including, but not limited to, the following:

10.1.3.1. Local terrain and weather rules.

10.1.3.2. Local flying area procedures.

10.1.3.3. Taxi or parking plans.

10.1.3.4. Evacuation or dispersal plans.

10.1.3.5. Noise abatement procedures.

10.1.3.6. Scheduling procedures.

10.1.3.7. Additional required publications (Para **6.4.**)

10.1.3.8. Bird Condition restrictions

10.1.4. Forward copies of local operating procedures to NAF Standardization and Evaluation office.

Chapter 11

NAVIGATOR PROCEDURES

11.1. General: All EC-130 operations requiring a navigator will use navigation forms prescribed by this volume.

11.1.1. Forms. This volume contains instructions for completion of AF Forms 4116, **C-130 Flight Plan and Record**. Samples of several are included. Computer flight plan forms may be used in lieu of the AF Form 70, **Pilotís Flight Plan and Flight Log**; and the flight plan portion of the AF Form 4116.

11.1.2. Communications. The navigator will record ATC clearances and monitor the readback. This includes all ATC instructions during departure, en route, and approach. **EXCEPTION:** Not required when ATC instructions require immediate execution by the pilot, or when such action would interfere with the timely performance of aircrew duties.

11.1.2.1. Monitor the primary command radio unless directed by the aircraft commander to do otherwise.

11.1.3. Departure and Approach Monitoring. Immediately after takeoff, cross-check available flight instruments with the airborne radar to ensure the aircraft remains clear of obstructions. During departure and arrival in instrument meteorological conditions (IMC) with airborne radar inoperative, use all available navigational aids to accurately position the aircraft. On all departures and arrivals, have the appropriate approach plate open to monitor course, timing, and altitude. The navigator will monitor the aircraft position using an ONC, TPC, or JOG chart. In IMC or at night the navigator will use all available navigational aids (including aircraft radar) to keep the aircraft clear of all obstructions. Backup the pilots and assist as necessary. Report any deviations immediately. Assist in clearing for other aircraft when possible. Confine activities to these critical duties during all departures and arrivals.

11.1.4. Flight Following. The navigator will flight follow on all missions using a suitable plotting chart (JNC, JNCA, or GNC). On flights along airways or Category II routes, use applicable plotting charts suitable for radar flight following (JNC, JNCA, or GNC). Use a chummed terrain chart (ONC scale or larger) depicting all terrain in the departure/arrival terminal area (within 25NM of the airfield).

11.2. Flight Planning Procedures:

11.2.1. General. Regardless of whether a flight plan is prepared by the aircrew or is furnished by another agency, the aircraft commander and navigator will verify routes and altitudes to ensure proper terrain clearance. On overseas flights, verify the flight planned routing against the diplomatic clearance, if applicable. Ensure all required fuel computations are accurate and complete, and confirm the ramp fuel load is compatible with mission requirements.

11.2.2. Category I Routes. Accomplish flight and fuel planning using the AF Form 4116 or a computer flight plan (CFP).

11.2.3. Category II Routes. Use the AF Form 70, AF Form 4116, or a CFP. Compute required fuel using the CFP.

11.2.4. Updating Charts. The AC and navigator will jointly verify routing, altitude, and fuel load prior to departure. Use the chart updating manual to CHUM within 25 NM of the approach and departure base for airfields without a DOD or ACC approved Jeppesen approach plate. A copy of the navigator's flight plan will be provided to the copilot to verify routing and aid in position reporting.

11.3. Computer Flight Planning. As with any computer generated mission planning product, the aircrew is always responsible for accuracy of data used in flight. Verify computer generated flight plans for correctness prior to each flight. Untested or BETA versions of developing software will not be used for actual mission planning. ***NOTE:*** The primary flight/mission planning system is the Air Force Flight Management System (AFFMS). This includes the Portable Flight Planning Software (PFPS/CFPS). Upgraded or new versions of PFPS/CFPS will be released and authorized by the MAJCOM/DO for use after applicable testing has been completed.

11.3.1. Creating Flight Logs. In addition to manual flight logs, computer flight planning systems including Computer Flight Planning System (CFPS), Portable Flight Planning System (PFPS), Falcon View are authorized to create a navigator flight log.

11.3.2. Electronic Data Transfer. If the flight planning computer transfers a flight plan to the air-craft electronically, it must be an ACC approved system. MAJCOM/DOT will periodically publish a listing of approved systems. Aircrews will not use unapproved versions of any system to load an aircraft navigation computer without MAJCOM/DOT approval. EC-130E/H aircrews are authorized to use the Data Transfer Module (DTM) for loading flight plan data.

11.3.3. Computer Fuel Plans. Computer aided flight planning systems (that meet the criteria in paragraph **11.3.1.**) produce flight plans and fuel calculations for C-130 and other aircraft. Computer Flight Plans may be used in place of the AF Form 4116. However, add alternate, identified extra, and reserve fuel in addition to the calculation. The printed format is user configurable and may be tailored to local needs. Section 4 covers detailed planning using these systems.

11.4. Fuel Planning. Accomplish fuel planning IAW T.O. 1C-130H-1-1. CFP en route fuel may be used for fuel analysis in lieu of en route 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.

11.4.1. AF Form 4116, C-130 Navigation Log Fuel Analysis . With the exception of those items explained in this paragraph, all items of the fuel analysis portion of the AF Form 4116 are explained fully in **Figure 11.1.** ***NOTE:*** Terminal fuel flow (item 1, AF Form 4116) is extracted from the CFP by using the fuel flow rate for the last hour of flight.

11.4.1.1. HIGHEST ACC FL. The highest cruise altitude or ceiling achieved using the planned climb profile based on planned takeoff gross weight, and without regard to ATC requirements for direction of flight. For planning purposes, use "maximum continuous power" for cruise altitude ceiling. When passengers are carried and oxygen is not available to them, the HIGHEST ACC FL will not exceed FL 250. Enter the flight level to the nearest 100 feet.

11.4.1.2. ENDURANCE. Flying time based on fuel available at takeoff (Item 11 minus Item 9). It is extracted from the appropriate fuel planning publication, performance manual, or CFP for the planned constant altitude, forecast temperature deviation, and the aircraft gross weight at takeoff.

11.4.1.3. BURN OFF. The amount of fuel burned from engine start to shut down. It includes en route, approach, taxi and run-up, and identified extra fuel for that mission segment (items

1+7+9+1000 pounds). It does not include fuel identified for subsequent mission segments or the 6000 pounds for minimum landing fuel. Entry in this block is optional.

Figure 11.1. AF Form 4116 Fuel Load Components.

1. EN ROUTE		Fuel for flight time from departure/EAR to EAR/overhead destination or initial penetration fix at cruise altitude (including time for planned search, recovery, approach, climb, when applicable).			
2. EN ROUTE RESERVE		10% of flight time over a Category I route or segment, not to exceed 1 + 00 fuel at normal cruise. For search missions, 10% of flight time for that portion with inadequate NAVAIDS from search point to a Category II route or segment. **Compute at terminal fuel flow.**			
4. ALTERNATE AND MISSED APPROACH		Alternate: Fuel for flight time from overhead destination of EAR to alternate/abort airfield, or most distant alternate when two are required. **Compute at terminal fuel flow.** Add 10% reserve when time to an alternate exceeds 1+30. Required whenever alternate must be filed. Missed Approach: 2200 pounds. Required if destination is below ceiling minimums, but above visibility minimums .	REQUIRED FUEL OVERAND DES	FLIGHT PLANNED LOAD	REQUIRED RAMP FUEL LOAD
5. HOLDING		Used when alternate not available, or located in Alaska, or at latitudes greater than 59 degrees N/S. **All aircraft except EC-130E Commando Solo use 3500 pounds** (EC-130E may use 2000 pounds). May compute using terminal fuel flow for 45 minutes.			
6. APPROACH AND LANDING		Approach: **1000 pounds. Entry always required.** Minimum landing fuel: **6000 pounds. Entry always required.** This fuel will not be included in BURNOFF.			
7. IDENTIFIED EXTRA	PRESSURIZATION LOSS	Additional fuel for pressure loss at ETP, used when pressurized, carrying passengers, & aircraft oxygen not available to the passengers. **Compute at 1000 pounds/hour for "T" time.** If computed fuel is less than item 2, no entry required here. If computed fuel exceeds item 2, add the difference here.			
	STORED FUEL	Ramp fuel for succeeding legs without refueling.			
	OFF-COURSE MANEUVERS	Fuel for anticipated off-course maneuvering for terrain, thunderstorm avoidance, ATC requirements. **Compute at 100 pounds per minute for departure, 50 pounds per minute for en route fuel.**			
	ICING	**500 pounds for each hour** of anticipated icing.			
	KNOWN HOLDING DELAYS	Fuel for anticipated or planned holding time. **Compute at terminal fuel flow.**			
	INSUFFICIENT OR UNRELIABLE NAVAIDS	**1000 pounds maximum.** Add for insufficient or unreliable NAVAIDS at destination and/or on the IFR track.			
	HELICOPTER OFFLOAD	Fuel planned for air refueling offload.			
9. TAXI AND RUNUP		**Normally 1300 pounds.** For known taxi delays or additional engine-running ground time in excess of 20 minutes, add 50 pounds per minute.			
12. UNIDENTIFIED EXTRA		Difference between required ramp and actual ramp fuel. **Should not exceed 2200 pounds** (for fuel conservation purposes)			
13. REQUIRED OVER DESTINATION		Total of items 4, 5, and 6. **Will never be less than 7000 pounds**.			
BURNOFF		Total en route fuel (#1) plus 1000 pounds (approach fuel) plus taxi and runup (#9) plus identified extra fuel (#7) (except stored fuel). **Entry optional.**			

11.5. Equal Time Point (ETP) Computations:

11.5.1. ETP Computations. Wind Factor and ETP Data 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. Suitable airfields are those within 100 NM of flight planned course centerline meeting weather, fuel, and EC-130E/H runway requirements from **Chapter 6** of this volume or the aircraft flight manual. For air refueling missions, make a separate computation for each fuel analysis required. The ETP should drive the location of your planned AR track. Plan to have sufficient fuel at each EAR point to proceed to an abort base if the tanker does not show. Use a point abeam the AR abort base as the LSAF or FSAF for wind factor computations, and enter ETP data on page 4 of AF Form 4116.

11.5.1.1. In-flight ETP. Recompute the ETP when the actual arrival over any reporting point prior to the ETP exceeds 15 minutes ahead or behind time when the change was caused by erroneous wind information. If the change was caused by factors other than a change in the wind (i.e., slow TAS or deviation for weather), simply compute a new ETA to the ETP, as the ETP itself will not have changed.

11.5.1.2. Wind Factor Data:

NOTE: In the following paragraphs for wind factor computation convenience, LSAF means level-off, abeam or over LSAF, or closest planned checkpoint or radio aid within 100 NM of LSAF. FSAF means abeam or over FSAF, closest planned checkpoint or radio aid within 100 NM of FSAF, descent point, or destination. Use any of the options in the ETP options graph, **Figure 11.1.** Specify the option used in the ETP computations section of the AF Form 4116. Record computations in the ETP computations section.

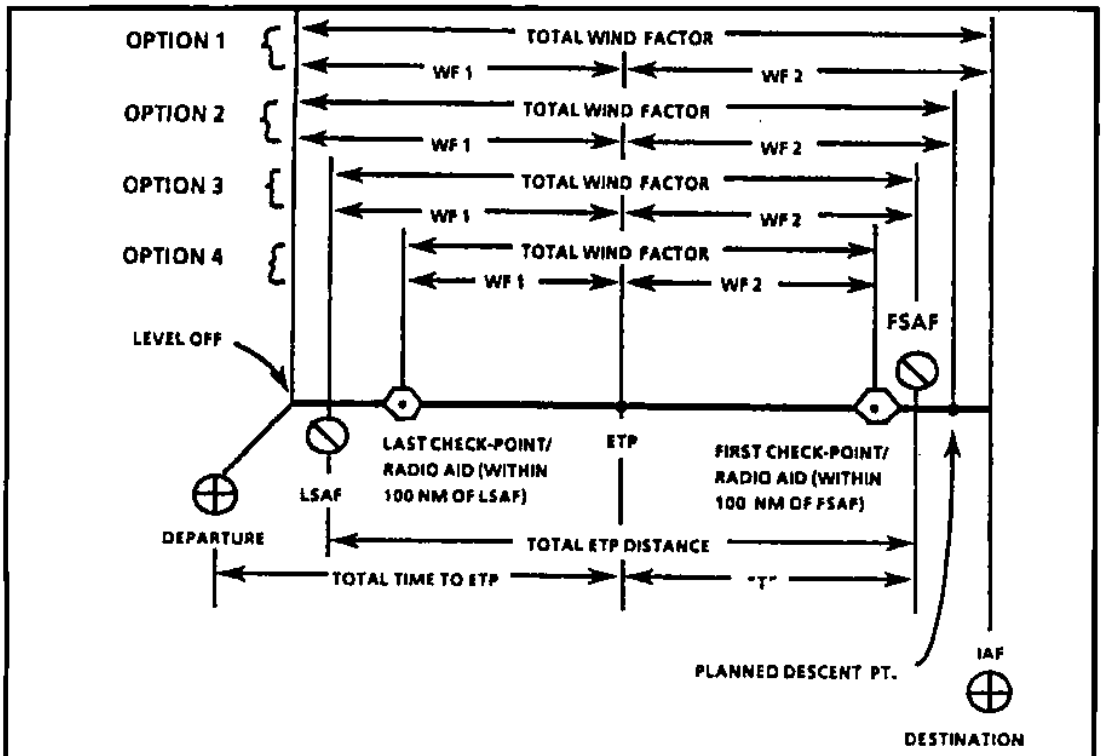
11.5.1.2.1. Total. Compute the average ground speed (GS) between LSAF and FSAF. Divide the total distance between the two end points by the total time between the two points:

Average GS = Total Distance/Total Time

Then, subtract average flight planned true airspeed (TAS) from average GS to obtain the total wind factor.

Total Wind Factor = Average GS - Average TAS

Figure 11.2. 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"

11.5.1.2.2. 1st Half. Compute the average GS between LSAF and approximate midpoint between LSAF and the FSAF. Subtract flight planned average TAS from the computed aver-

age GS to obtain the 1st half wind factor.

11.5.1.2.3. 2nd Half. Compute the average GS between the approximate midpoint and the FSAF. Subtract flight planned TAS from the computed average GS to obtain the 2nd half wind factor.

11.5.1.3. ETP Data:

11.5.1.3.1. DISTANCE (LSAF TO FSAF). Enter the total distance (regardless of level off) from or abeam the LSAF along course from departure to or abeam the FSAF along course toward destination.

11.5.1.3.2. T( )MIN. The flight time from the ETP to the FSAF or return to the LSAF.

11.5.1.3.3. TOTAL TIME TO FSAF - T = TIME TO ETP. Subtract the time, T( )MIN, from the total flight plan time to the FSAF. TIME TO ETP is the total time from departure to the ETP (departure and takeoff may not necessarily be the same). Compute and record ETA to ETP by adding TIME TO ETP to departure time.

11.5.1.4. Signature Block. Sign the page 1 of AF Form 4116 after completing the flight plan portion (or verifying the CFP) and completing the time and fuel analysis, wind factor, and ETP data.

11.6. Flight Charts. Maintain a plotting chart showing flight progress on all Category I routes. The following information will be shown on the chart:

11.6.1. Navigatorís name and coordinated universal date in the vicinity of departure or coast out point. Chart number, and chart edition will be annotated on the back of all stripped charts.

11.6.2. The flight plan centerlines and portions of ADIZ and FIR boundaries pertinent to the route. Label reporting points with proper names or geographical coordinates. Prominently mark warning and restricted areas within 25 NM of planned course and 3000 feet of planned altitude on the chart (not required if a FLIP en route chart with this information is immediately available and used). Annotate airfields along the planned route (within 50 NM) which could serve as possible emergency landing areas. Consider the following factors when selecting emergency airfields: type aircraft, weather conditions, runway length, runway weight-bearing capacity, runway lighting, radio navigational aids, and proximity to planned flight path.

11.6.3. Fixes or position plots and clearly designated time of each fix or position. Fixes or positions may be numbered and the corresponding numbers entered in the position column of the log instead of the geographical coordinates or descriptive position. Use standard symbols from AFPAM 11-216.

11.7. Flight Records Completion (AF Form 4116). This form will include in-flight progress and proposed data. Complete it in sufficient detail to fully evaluate or reconstruct the flight. The section is divided into two parts on the front side of the form (actual and proposed), with substantiation areas on the backside of the form. These procedures are designed to accommodate a wide range of different C-130 navigation equipment configurations.

11.7.1. AF Form 4116, C-130 Flight Plan and Record. All items in the flight plan portion are self-explanatory except as noted.

11.7.1.1. ZONE OR WPT. Used to list waypoints and fuel zones.

11.7.1.2. TO. List proper names of intersections, waypoints, or coordinates if no name is assigned. Include a separate flight plan line for all of the following (use an additional AF Form 4116 if required).

11.7.1.2.1. Initial Level Off. A separate line is not required when using ACCI-series fuel planning publications to determine en route fuel, but is recommended for ETP computations. Compute zone time for climb lines by using average climb TAS. If a line contains both climb and cruise, compute zone time at en route TAS plus 1 minute for each 4000 feet of climb.

11.7.1.2.2. Level off after air refueling. Compute as in paragraph 11.6.1.3.

11.7.1.2.3. Rendezvous or Air Refueling (receiver only). From the ARIP to the EAR.

11.7.1.3. RETA. Revised ETA. Use this column when route diversions or unexpected speed changes cause significant ETA changes (greater than 3 minutes).

11.7.1.4. A OR B. Ahead or behind. Entry optional.. List minutes ahead of (A) or behind (B) flight plan time. Based on original ETA.

11.7.1.5. ALTERNATE. Use AFI 11-202V3, *General Flight Rule*s, and **Chapter 6** of this volume, to determine the requirement for a destination alternate airfield. Enter the proper name or the ICAO identifier of the alternate airfield, if required. Enter the AR abort airfield for legs ending with air refueling.

11.7.1.5.1. DISTANCE. The straight line distance or total flight planned zone distance from destination to alternate airfield. For air refueling, use the straight line distance or total flight planned zone distance from EAR to abort airfield.

11.7.1.5.2. TIME. Compute using cruise true airspeed and best known wind.

11.7.2. Actual Side:

11.7.2.1. The actual side of the flight log will contain actual observations and data obtained in-flight to substantiate the progress and position of the aircraft. When an entry is the same as the entry above it, a check mark may be used to indicate "same as previous entry."

11.7.2.2. POSITION. Enter one of the following:

11.7.2.2.1. Position coordinates (latitude and longitude).

11.7.2.2.2. Number or letter corresponding to the specific fix or position on the navigation chart.

11.7.2.2.3. Proper name or ICAO identifier of the navigation facility (e.g., LEV VORTAC) or geographical point. ***NOTE:*** A position entry may be a fix, Dead Reckoning (DR) position, air position, or Most Probable Position (MPP).

11.7.2.3. TC. Enter the measured true course (for position to position computations) from the previous position to the current logged position.

11.7.2.4. W/V. Wind and drift block. Enter either the computed average wind (fix to fix) based on the data entered on the actual side, or an average wind at the position from reliable Doppler, Inertial Navigation System (INS), Self-Contained Navigation System (SCNS), Global Positioning System (GPS), and Computer-Aided Navigation System (CANS). Use either computed or computer derived average drift correction.

11.7.2.5. TH. Enter the average true heading (computed from average compass heading or TH) from last fix or air position to current air position.

11.7.2.6. TAS. Enter the average true airspeed since the previously logged position.

11.7.2.7. ALT. Enter the altitude flown since the previously logged position.

11.7.2.8. GD/AD. Ground distance/air distance. The ground distance flown since the last fix or position if the data will be used to compute the ground speed (position to position computations). If the line is a ground plot DR line, enter the computed ground distance (from ground speed and time) for the DR position. If the line is used for air plot, enter the air distance computed from true airspeed and time since last fix or position.

11.7.2.9. TIME. Enter the time corresponding to the distance used in paragraph **11.6.2.8.**

11.7.2.10. GS. Ground Speed. Enter computed ground speed for position to position data. Enter an average ground speed from Doppler, INS, SCNS, GPS, or CANS if the system information is reliable.

NOTES:

1. When flying designated Category II portions of the route, no entries are required in the actual or proposed sides. ETA/ATA blocks on the flight plan portion satisfy log requirements.
2. On Category I routes, when Doppler, INS, SCNS, GPS, or CANS are providing reliable information, only time, position, average true heading, average true airspeed, altitude, and spot wind entries are required on the actual side for a full-line entry.

11.7.3. Proposed Side:

11.7.3.1. The PROPOSED side of the log will contain "the best known information" required to proceed to a point or abeam a point down track indicated in the CHECKPOINT block. When an entry is the same as the entry above it, a check mark may be used to indicate "same as previous entry."

11.7.3.2. TAS. Enter the proposed true airspeed between present logged position and the next position.

11.7.3.3. TC. Enter the measured true course to the next position.

11.7.3.4. W/V. Wind and drift block. Enter the best known wind information in the W/V block. A spot wind from Doppler, INS, SCNS, GPS, or CANS may be used. Enter a computed drift correction or spot drift correction in the DC block. Drift correction and ground speed will correspond with the wind used.

11.7.3.5. All blocks on the proposed side of the log require entries except in the following circumstances:

11.7.3.5.1. On portions of flights designated Category II.

11.7.3.5.2. On departure, approach, and other segments of the flight under positive radar control.

11.7.3.5.3. When numerous alters for weather, traffic, etc., make the accomplishment of the entries impractical.

11.7.3.6. REMARKS. Use the REMARKS sections to record pertinent information and events along with times of the events. Remarks will include, but not be limited to, clearances, equipment malfunctions, computer updates, navigator changeovers, and alter headings. Alter headings may be individually plotted or averaged to obtain DR positions.

11.7.4. Clearance/Remarks. Enter ATC clearances as discussed in paragraph **11.1.3.**When practical, record assigned ATC frequencies on departure and approach in this section. Use this section to record other pertinent flight information as required.

11.7.5. Nav Aid Data. Use this section to record actual and corrected readings (if applicable). Compare Doppler, INS, SCNS, GPS, and/or CANS positions (latitude and longitude, or distance-to-go and cross track) for each position fix. At minimum, record the integrated navigation solution. If a navigation solution is updated, record its incorrect position and show that it was updated (in remarks section). Fix data substantiated by ICAO identifier or coordinates in the position block on the actual side of the AF Form 4116 need not be duplicated in this section.

11.7.6. Calibration. Use this section for true airspeed and heading deviation checks.

11.7.6.1. Heading Checks. See AFPAM 11-216, *Air Navigatio*n, for additional information. For Celestial Heading Checks, use exact longitude (degrees and minutes), LHA, declination (DEC), and latitude to interpolate for exact ZN (use the "15/45" rule for this interpolation). Zn, headings, and deviations should be recorded or computed to the nearest tenth. All blocks are self-explanatory except the following:

11.7.6.1.1. DEV/CORR. Use this block to record INS, SCNS, GPS, or CANS deviation from actual heading and corrections to be applied to computer heading.

11.7.6.1.2. COMPUTER. Record INS, SCNS, GPS, or CANS, displayed heading in this block. ***NOTE:*** Regardless of the method used, ensure the sextant vertical reticule is properly aligned or apply an appropriate correction.

11.7.6.2. True Airspeed Checks. All blocks are self-explanatory except the following:

11.7.6.2.1. IOAT. Indicated outside air temperature. Not applicable for aircraft with operable TOAT displays.

11.7.6.2.2. TOAT. True outside air temperature. Apply correction to IOAT for heat of compression error (obtained from the aircraft performance manual). For aircraft with operable TOAT displays, enter the displayed value.

11.7.6.2.3. IAS, CAS, EAS, TAS. Use the ICE-T method in AFPAM 11-216 to convert indicated airspeed (IAS) to true airspeed (TAS). Use the appropriate flight performance manual for airspeed corrections. On aircraft with TAS displays from operable air data computers/ transducers (ADCs/ADTs), enter only the displayed TAS value. Where two values are displayed from different ADCs/ADTs, enter the average of the two values. ***NOTE:*** For 245 and 270, true airspeeds, navigators on all EC-130 models may use +1 knots for IAS to CAS correction, and minus 2 knots for CAS to EAS correction.

11.7.6.2.4. ITAS. Indicated true airspeed. Read directly from the true airspeed gauge.

11.7.6.2.5. CORR. Correction to ITAS. Subtract ITAS from TAS.

11.7.6.2.6. ITAS. Indicated true airspeed. Subtract indicated true airspeed (read directly from the true airspeed gauge) from computed TAS. Result will be CORR (correction to the ITAS). Navigators should also check the SCNS/CANS TAS for accuracy.

11.8. Enroute Procedures. Heading deviation checks are not required on Category routes.

11.8.1. Deviation Checks. On Category I routes or route segments, compute a heading deviation for each system being used as soon as practical after initial level off or coast out. Record deviation for all compass systems. On aircraft with reliable single INS or SCNS with a reliable INS, accomplish an initial heading deviation check to validate the INS heading. If INS heading differs from both compass-derived headings by more than 2 degrees, perform a celestial heading check. On dual INS equipped aircraft, if the INS true headings agree within 2 degrees of each other, they may be used in lieu of celestial heading checks as the primary heading reference. **EXCEPTION:** A deviation check is not required on flights transiting Category I routes of 2 hours or less if: the aircraft is equipped with two or more operable heading systems (the standby compass is not considered a system for this requirement).

11.8.2. True Airspeed Checks. Compute a true airspeed check within 1 hour after reaching the initial cruise altitude.

11.8.3. Fix Interval. Time between recorded positions (full-line entries on AF Form 4116, actual and proposed sides) will not exceed 1+20. Under normal conditions, 1 hour or less is the recommended time between recorded positions.

11.8.3.1. Immediately report malfunctions or loss of navigational capability which will degrade course centerline accuracy to the air traffic control center (ATCC).

11.8.3.2. Provide en route data for AF Form 72, **Air Report (AIREP**), for flights outside the contiguous US when required by computer flight plan.

11.9. Celestial Procedures:

11.9.1. Precomps. Numerous specialized techniques are discussed in AFPAM 11-216.

11.9.2. Celestial Heading Checks. See AFPAM 11-216 for a comprehensive discussion of celestial concepts.

11.10. In-flight Fuel Management. Required for each flight over a Category I route when the flight time between LSAF and FSAF airfields is 5 hours or more. Use the in-flight fuel management section on the AF Form 4116. Refer to procedures in local **Chapter 10**.

11.11. Airborne Radar Approach (ARA) Procedures:

11.11.1. VFR Operations. Units will submit VFR ARA approach plates for approval to NAF Stan/Eval (MAJCOM Stan/Eval if no NAF exists). During VFR, the minimum ceiling and visibility will be 1,500 feet and 3 miles. Use **Figure 11.3.** for ARA Construction Procedures. Publish approved VFR ARA approaches in **Chapter 10**. **Chapter 10** should include SCNS ARA input data. If available, pilots will back up the navigator using a published instrument approach.

11.11.2. IFR Operations. Refer to AFI 11-202 V3, and **Chapter 5** and **Chapter 8** for Self-Contained Approaches (SCA). Weather minimums will be established non-precision airfield minimums, or 500 feet and 1 mile, whichever is higher.

11.11.2.1. Except for contingencies, ARAs conducted in actual IMC must use approach plates published by the Defense Mapping Agency Aeronautical Center (DMAAC) or approved by MAJCOM. During contingencies, the MAJCOM DO or JFACC may approve IMC ARA approach plates. Units must comply with any restrictions in FLIP or the host nation agreement, and receive written approval from ATC and airspace management authority.

11.11.3. Radar Monitoring. Use ground-based radar monitor, where available (IFR and VFR).

11.11.4. Planning and Coordination. Prior to entering the terminal area, the navigator will coordinate the following items with the pilot (see ARA briefing guide, AFI 11-2C-130V3 CL-5, *Navigator Checklist*):

11.11.4.1. Desired pattern altitude and headings.

11.11.4.2. Distance on final where descent will commence.

11.11.4.3. Glide slope angle and initial rate of descent (normally not greater than 400 feet per NM).

11.11.4.4. Minimum descent altitude and missed approach. Missed approach will conform to published procedures for a usable approach, if available.

11.11.5. Terminology and Procedures:

11.11.5.1. The navigator will advise the pilot when positive radar identification of the airfield complex is made.

11.11.5.2. The navigator will direct the aircraft by headings to the final approach course.

11.11.5.3. During the approach, the navigator will advise the pilot of the drift and groundspeed. If pilots can view this information on the selected SCNS/INS display, this advisory is not required.

11.11.5.4. The turn onto base leg (if required) should be made to allow for a 10 NM final (or as required).

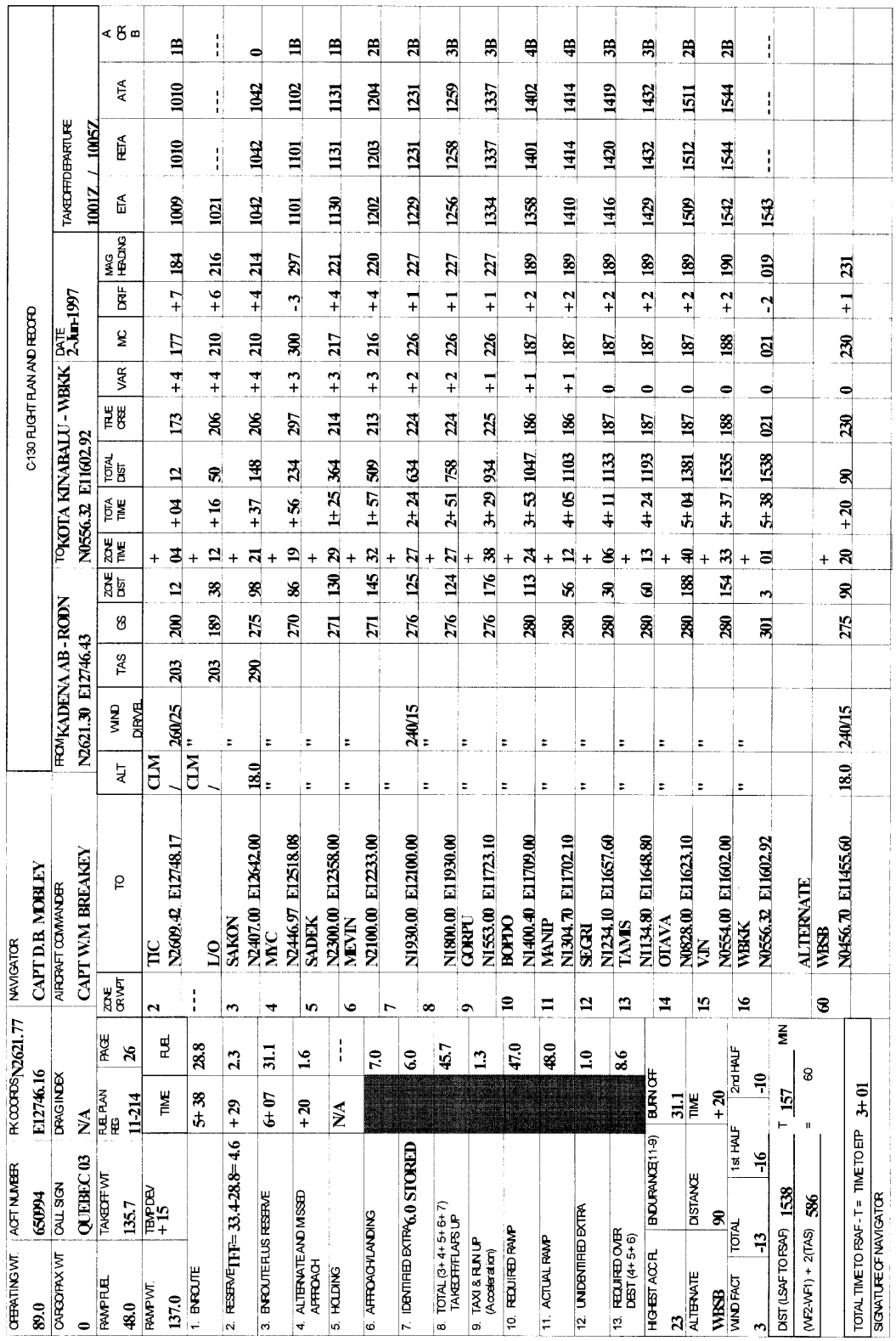
11.11.5.5. The navigator will state the distance from touchdown each mile from the end of the runway beginning 10 miles out. A glide path warning should be given 10 seconds prior to the "begin descent point."

11.11.5.6. The navigator will give heading information at least every nautical mile during the final approach.

11.11.5.7. Use **Chapter 5** procedures for required non-precision approach calls upon reaching the MDA.

11.12. Sample Entries. The following pages show representative entries for approved navigational forms.

Figure 11.3. AF Form 4116, C-130 Flight Plan and Record (1 of 4)



C-130 FLIGHT PLAN AND RECORD

OPERATING WT.	ACFT NUMBER	PK COORDS N2621.77	NAVIGATOR
89.0	650994	E12746.16	CAPT D.B. MOBLEY
CARGO/PAX WT	CALL SIGN	DRAG INDEX	AIRCRAFT COMMANDER
0	QUEBEC 03	N/A	CAPT W.M. BREAKEY

FROM KADENA AB - RODN N2621.30 E12746.43 — TO KOTA KINABALU - WBKK N0556.32 E11602.92 — DATE 2-Jun-1997 — TAKEOFF/DEPARTURE 1001Z / 10057

RAMP FUEL	TAKEOFF WT	FUEL PLAN REG	PAGE
48.0	135.7	11-214	26

RAMP WT.	TEMP DEV
137.0	+15

ETE= 33.4-28.8= 4.6

	ZONE OR WPT	TO	ALT	WIND DIR/VEL	TAS	GS	ZONE DIST	ZONE TIME	TOTA TIME	TOTAL DIST	TRUE CRSE	VAR	MC	DRIF	MAG HEADING	ETA	RETA	ATA	A OR B
	2	TIC	CLM					+											
		N2609.42 E12748.17	/	260/25	203	200	12	04	+04	12	173	+4	177	+7	184	1009	1010	1010	1B
1. ENROUTE	---	L/O	CLM	"				+											
5+38 28.8			/	"	203	189	38	12	+16	50	206	+4	210	+6	216	1021	---	---	---
2. RESERVE	3	SAKON		"				+											
6+29 2.3		N2407.00 E12642.00	18.0	"	290	275	98	21	+37	148	206	+4	210	+4	214	1042	1042	1042	0
3. ENROUTE PLUS RESERVE	4	MVC	"	"				+											
6+07 31.1		N2446.97 E12518.08				270	86	19	+56	234	297	+3	300	-3	297	1101	1101	1102	1B
4. ALTERNATE AND MISSED APPROACH	5	SADEK	"	"				+											
+20 1.6		N2300.00 E12358.00	"	"		271	130	29	1+25	364	214	+3	217	+4	221	1130	1131	1131	1B
5. HOLDING	6	MEVIN	"	"				+											
N/A ---		N2100.00 E12233.00				271	145	32	1+57	509	213	+3	216	+4	220	1202	1203	1204	2B
6. APPROACH/LANDING	7		"					+											
7.0		N1930.00 E12100.00		240/15		276	125	27	2+24	634	224	+2	226	+1	227	1229	1231	1231	2B
7. IDENTIFIED EXTRA 6.0 STORED	8		"	"				+											
6.0		N1800.00 E11930.00				276	124	27	2+51	758	224	+2	226	+1	227	1256	1258	1259	3B
8. TOTAL (3+ 4+ 5+ 6+ 7) TAKEOFF FLAPS UP	9	GORPU	"	"				+											
45.7		N1553.00 E11723.10				276	176	38	3+29	934	225	+1	226	+1	227	1334	1337	1337	3B
9. TAXI & RUN UP (Acceleration)	10	BOPDO	"	"				+											
1.3		N1400.40 E11709.00				280	113	24	3+53	1047	186	+1	187	+2	189	1358	1401	1402	4B
10. REQUIRED RAMP	11	MANIP	"	"				+											
47.0		N1304.70 E11702.10				280	56	12	4+05	1103	186	+1	187	+2	189	1410	1414	1414	4B
11. ACTUAL RAMP	12	SEGRI	"	"				+											
48.0		N1234.10 E11657.60				280	30	06	4+11	1133	187	0	187	+2	189	1416	1420	1419	3B
12. UNIDENTIFIED EXTRA	13	TAMIS	"	"				+											
1.0		N1134.80 E11648.80				280	60	13	4+24	1193	187	0	187	+2	189	1429	1432	1432	3B
13. REQUIRED OVER DEST (4+ 5+ 6)	14	OTAVA	"	"				+											
8.6		N0828.00 E11623.10				280	188	40	5+04	1381	187	0	187	+2	189	1509	1512	1511	2B
HIGHEST ACC FL 23	15	VJN	"	"				+											
BNDURANCE(11-9) 31.1		N0554.00 E11602.00				280	154	33	5+37	1535	188	0	188	+2	190	1542	1544	1544	2B
BURN OFF	16	WBKK	"	"				+											
ALTERNATE WBSB	DISTANCE 90	TIME +20				301	3	01	5+38	1538	021	0	021	-2	019	1543	---	---	---
WIND FACT 3	TOTAL -13	1st HALF -16	2nd HALF -10	T 157 MIN															
DIST (LSAF TO FSAF) 1538																			
(WF2-WF1) + 2(TAS) 586		= 60																	

ALTERNATE

60	WBSB							+											
	N0456.70 E11455.60	18.0	240/15		275	90	20	+20	90	230	0	230	+1	231					

TOTAL TIME TO FSAF - T = TIME TO ETP 3+01

SIGNATURE OF NAVIGATOR

Figure 11.4. AF Form 4116, C-130 Flight Plan and Record (2 of 4)

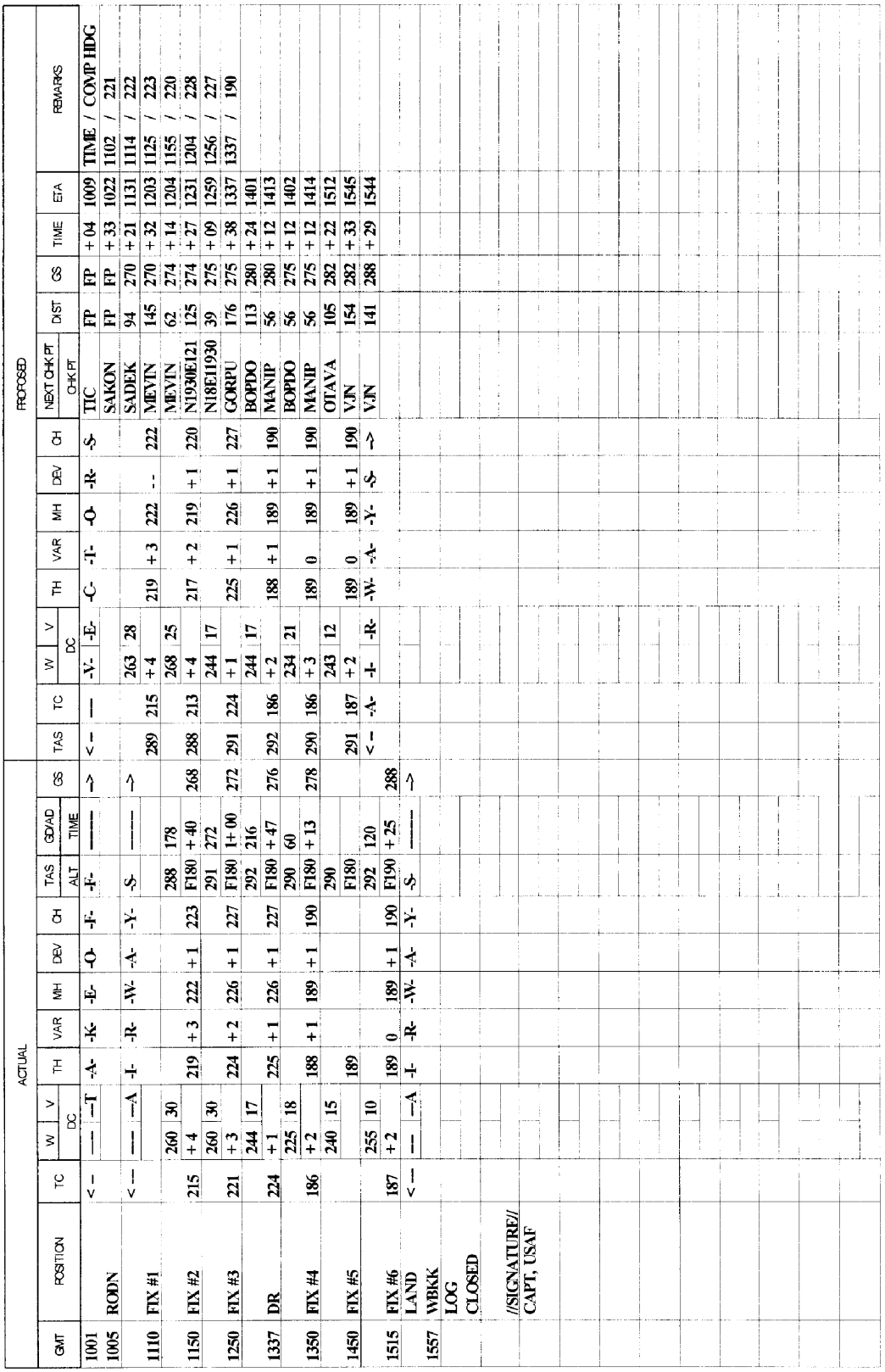
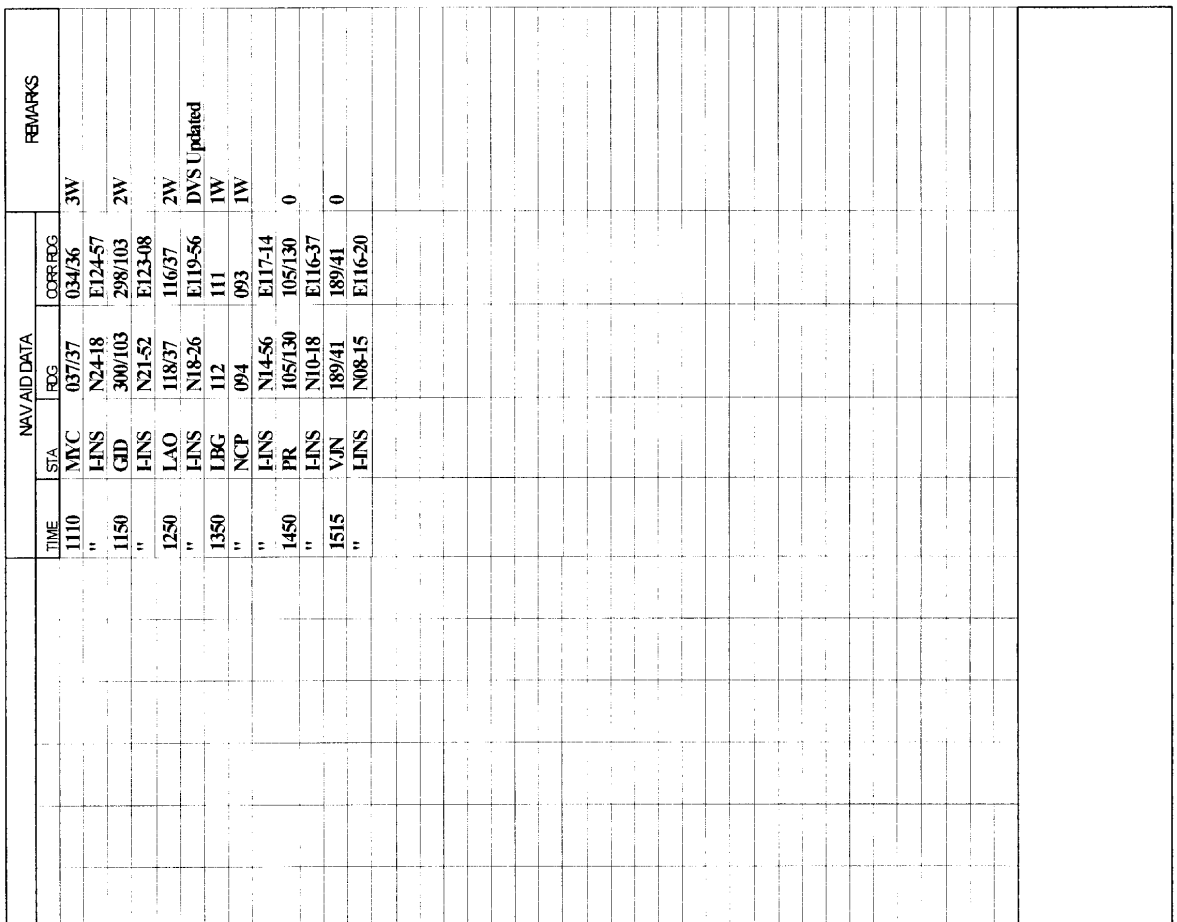


Figure 11.5. AF Form 4116, C-130 Flight Plan and Record (3 of 4)



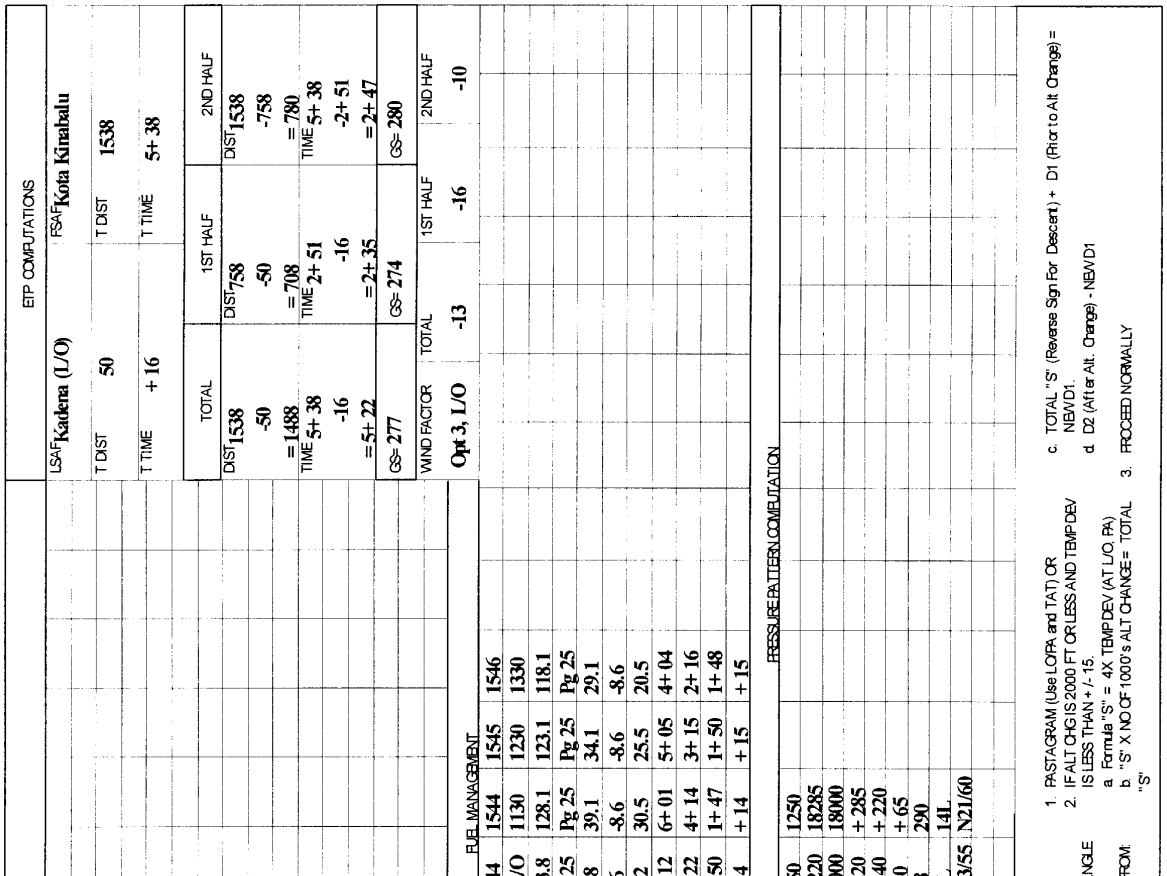
CELESTIAL COMPUTATION DATA

TIME			1150		1250		1350		
BODY	Capell	Sirius	Ham	Polari	Rigel	Ham	Jup	Moon	
DR LAT		N	21-53		N	18-30	N	14-51	
DR LONG		E	123-06		E	119-56	E	117-15	
GHA			308-58			324-00	239-40	215-27	
CORR			---			---	+ 2-00	---	
SHA			---			---	---	---	
GHA			308-58			324-00	241-40	215-27	
PLUS 360			---			---	---	---	
ASSUM -W			123-02			120-00	117-20	117-33	
LONG + E									
LHA	070	071	072	082	083	084	359	333	
ASSUM LAT			N22			N19	N15	N15	
DEC			---			---	N08	N12	
HS TIME	1142	1146	1150	1242	1246	1250	1346	1350	
HS	65-23	41-22	52-49	57-44	62-47	41-10	83-27	62-58	
CORR SEXT									
CORR REFR	0	-1	0	0	0	-1	0	0	
CORR PA SD								+ 28	
CORR TOTAL	0	-1	0	0	0	-1	0	+ 28	
HO	65-23	41-21	52-49	57-44	62-47		83-27	63-26	
TOTAL ADJ						41-09			
ADJ HO									
TAB HC							82-56	63-36	
CORR (d)							+ 59	+ 09	
CORR DEC							38	33	
TOTAL CORR							+ 37	+ 05	
CORR HC	64-54	41-16	52-56	57-26	62-27	41-19	83-33	63-41	
INTCP (T/A)	29T	5T	7A	18T	20T	10A	6A	15A	
ZN	015	140	280	067	190	285	172	093	
TRACK			215			223		186	
ZN-TR									
MOT OBS									
MOT BODY									
COMB ADJ									
GS			268			272		275	
ACFT ALT			FL180			FL180		FL180	
CORIOLIS			2R			2R		2R	
RN			---			---		---	
FOL CORR									
FOL LAT									

NAV AID DATA				REMARKS
TIME	STA	ROG	CORR ROG	
1110	MYC	037/37	034/36	3W
"	I-INS	N24-18	E124-57	
1150	GID	300/103	298/103	2W
"	I-INS	N21-52	E123-08	
1250	LAO	118/37	116/37	2W
"	I-INS	N18-26	E119-56	DVS Updated
1350	LBG	112	111	1W
"	NCP	094	093	1W
"	I-INS	N14-56	E117-14	
1450	PR	105/130	105/130	0
"	I-INS	N10-18	E116-37	
1515	VJN	189/41	189/41	0
"	I-INS	N08-15	E116-20	

REMARKS

Figure 11.6. AF Form 4116, C-130 Flight Plan and Record (4 of 4)



CELESTIAL COMPUTATION DATA

BODY	Capella	Sirius	Hamal	Pollux	Rigel	Hamal	Jupiter	Moon
TIME	1142	1146	1150	1242	1246	1250	1346	1350
LAT			N22			N19	N15	N15
DEC			---			---	N08-38	N12-33
GHA			308-58			324-00	241-40	215-27
+ - 360			---			---	---	---
GHA			308-58			324-00	241-40	215-27
LONG -W/+ E			123-02			120-00	117-20	117-33
LHA	070	071	072	082	083	084	359	333
HC	64-54	41-16	52-56	57-26	62-27	41-19	82-56	63-36
CORR	0	+1	0	0	0	+1	+37/0	+5/-28
CORR HC	64-54	41-17	52-56	57-26	62-27	41-20	83-33	63-13
HO	65-23	41-22	52-49	57-44	62-47	41-10	83-27	62-58
INTOP (T/A)	29T	5T	7A	18T	20T	10A	6A	15A
ZN	015	140	280	067	190	285	172	093
LONG CONV	C= 2R	TC215	GS268	C= 2R	TC223	GS272	C= 2R	TC186

GS275

CALIBRATION

TIME	1120	1427	TIME	1027		RETA DEST	---	1544
BODY	Polaris	Jupiter	ALT (PA)	F180		TIME	T/O	L/O
GHA	301-26	198-41	IOAT	+2		GROSS WT.	135.6	133.8
CORR	---	+1-45	TOAT	-7		PAGEBURN RT	---	Pg 25
GHA	301-26	200-26	IAS	217		FUEL REM	46.6	44.8
EXACT LONG -W/+ E	124-28	116-52	CAS	217		CH FUEL		-8.6
LHA	065-54	317-18	EAS	214		DIFF		36.2
DEC		N08-58	TAS	291		FUEL ETE		7+ 12
EXACT LAT	N23-41	N12-58	-ITAS	288		ETE DEST		5+ 22
APPROX HC	23-41	48-08	CORR	+3		EXT TIME		1+ 50
ZN/GZN	359.5	091.75				TEMP DEV/ALT		+14
IRB	219.5	---	TIME					
TH/GH	219.0	188.5	ALT (PA)					
VAR	+3W	+.5W	IOAT					
MH	222.0	189.0	TOAT					
DEV	+.7	+.9	IAS					
NO. 1 CH	222.7	189.9	CAS					
DEV	-3	-2	EAS					
NO. 2 CH	221.7	188.8	TAS					
DEV	+2.0	+1.0	-ITAS					
STBY. CH	224	190	CORR					
DEV	-1	+1						
COMPUTER	221.9	189.1						

FUEL MANAGEMENT

1544	1545	1546			
L/O	1230	1330			
128.1	123.1	118.1			
Pg 25	Pg 25	Pg 25			
39.1	34.1	29.1			
-8.6	-8.6	-8.6			
30.5	25.5	20.5			
5+ 01	5+ 05	4+ 04			
4+ 14	3+ 15	2+ 16			
1+ 47	1+ 50	1+ 48			
+14	+15	+15			

PRESSURE PATTERN COMPUTATION

1150	1250				
18220	18285				
18000	18000				
+220	+285				
+140	+220				
+80	+65				
288	290				
D2-D1 = ZN	151				
E/AS K	N23/55	N21/60			
ZN DRANG					
GDST= 57.3					

ETP COMPUTATIONS

LSAF **Kadena (L/O)** FSAF **Kota Kinabalu**

T DIST	50	T DIST	1538
T TIME	+16	T TIME	5+ 38

	TOTAL	1ST HALF	2ND HALF
DIST	1538	758	1538
	-50	-50	-758
	=1488	=708	=780
TIME	5+ 38	2+ 51	5+ 38
	-16	-16	-2+ 51
	=5+ 22	=2+ 35	=2+ 47
GS=	277	274	280

WIND FACTOR	TOTAL	1ST HALF	2ND HALF
Opt 3, L/O	-13	-16	-10

HEADING CHECKS

GD	ZN DRANG
DRAFT (L/R)	GDST= 57.3

HEAT OF COMPRESSION (TEMP'C)

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

1. TRUE BEARING: READ TH UNDER VERT. RETICLE
2. RELATIVE BEARING: TH = ZN - RB
3. INVERSE RELATIVE BEARING: TH = ZN + IRB

NORTH HEM: ZN PLUS, PLOT LEFT
SOUTH HEM: ZN PLUS, PLOT RIGHT
BELLAMY DRIFT: ZN RIGHT, DRIFT ANGLE RIGHT

1. PASTAGRAM (Use LOPA and TAT) OR
2. IF ALT CHG IS 2000 FT OR LESS AND TEMP DEV IS LESS THAN +/- 15:
   a. Formula "S" = 4X TEMP DEV (AT L/O, PA)
   b. "S" X NO OF 1000's ALT CHANGE = TOTAL "S"
   c. TOTAL "S" (Reverse Sign For Descent) + D1 (Prior to Alt Change) = NEW D1.
   d. D2 (After Alt. Change) - NEW D1
3. PROCEED NORMALLY

Figure 11.7. ARA Pattern Construction Procedures.

ARA CONSTRUCTION PROCEDURES

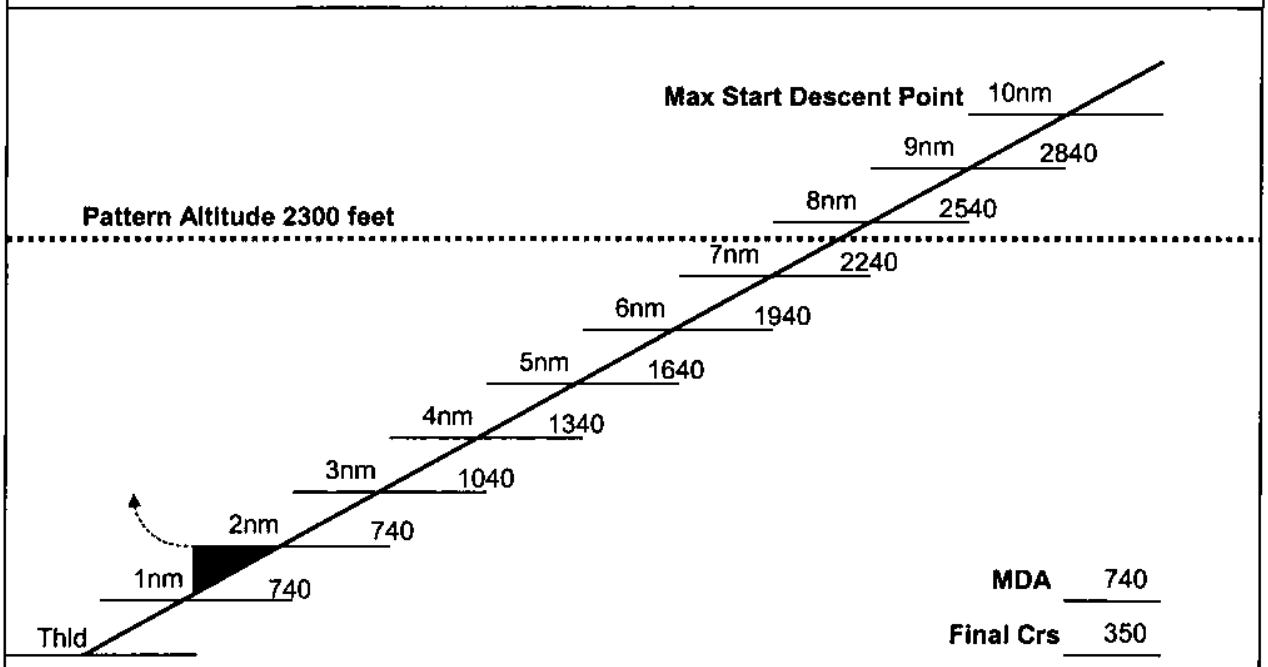
BRIEFING ITEMS
- Approach
- Minimums
- Missed Approach
- Landing Runway
- Timing
- Terrain

Fld Elevation 240
+ 500 ft + 500
MDA = 740

ABSOLUTE ALTITUDE AT DISTANCE OUT

DESC<	THLD	1nm	2nm	3nm	4nm	5nm	6nm	7nm	8nm	9nm	10nm
2.0	A	212	424	636	848	1060	1272	1484	1696	1908	2120
2.5	A	265	530	795	1060	1325	1590	1855	2120	2385	2650
2.83	A	300	600	900	1200	1500	1800	2100	2400	2700	3000
3.0	A	318	636	954	1272	1590	1908	2226	2544	2862	3180
3.5	A	371	742	1113	1484	1855	2226	2597	2968	3339	3710

Add "A" to alt above to build glideslope. Brief and fly ARA



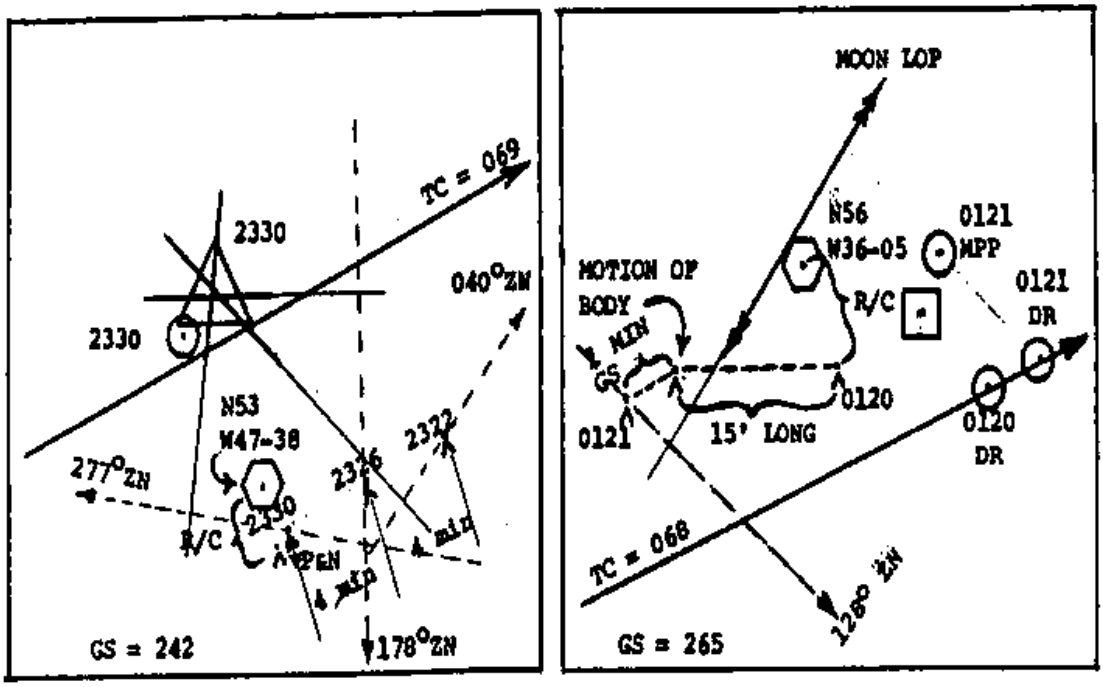
RATE OF DESCENT IN FT/MIN

DESC<	FT/MIN	105K	110K	115K	120K	125K	130K	135K	140K	145K	150K
2.0	212	371	388	406	424	441	459	477	494	512	530
2.5	265	464	486	508	530	552	574	596	618	640	662
2.83	300	525	550	575	600	625	650	675	700	725	750
3.0	318	557	583	610	636	663	689	716	742	769	795
3.5	372	651	682	713	744	775	806	837	868	899	930

Figure 11.8. Celestial Plotting Example.

CELESTIAL COMPUTATION DATA									
BODY	MIRFAK	ALTAIR	ARCT.				MOON		
TIME	2322	2326	2330				0120	Shot at 0121	
LAT			N53				N56	Moved assumed	
DEC			-				N5-04	position	
GHA			344-38				352-05		
± 360			-				-		
GHA			344-38				352-05		
LONG -W +E			W47-38				W36-05		
LHA	295	296	297				316		
HC	26-10	45-49	19-17				28-14		
CORR	+1	0	+1				-46		
CORR HC	26-11	45-49	19-18				27-28		
HO	25-59	45-21	19-36				27-33		
INTCP (T/A)	12A	28A	18T				5T		
ZN	040	178	277				128		
LONG/CONV	Coriolis/Rhumb. Corr=6.4R						Cor/Rhumb Corr =7.5N		
GRID ZN	TC=069/GS=242						TC=068/GS=265		

EXAMPLE 1(3-LHA) EXAMPLE 2(LATE SHOT)



PLOTTING EXAMPLE 1 PLOTTING EXAMPLE 2

Chapter 12

FLIGHT ENGINEER (FE) PROCEDURES AND FORMS

Section 12A—Normal Procedures

12.1. General. In addition to duties in the flight manual and other applicable technical orders, FEs 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 FE as necessary.

12.2. Responsibilities. The FE is responsible to the AC for all inspections and procedures required by the applicable technical orders and DoD and Air Force instructions (AFI).

12.3. Authority to Clear Red X Symbols. FEs 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 FE may obtain authorization to clear the Red X from the logistics group commander, operations group commander (or designated representative), or chief of maintenance, in accordance with TO 00-20-1. At en route stations, FEs 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.

12.4. Aircraft Servicing. FEs are normally not required to refuel or de-fuel aircraft; however, the FE 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 FE 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.

12.4.1. In order to comply with the intent of primary fuel management and provide the greatest flexibility for maintenance and operations, standard ramp fuel loads in excess of 28,000 pounds should be loaded as follows:

12.4.1.1. For outboard main tanks, 7,500 pounds each is the minimum to be considered full.

12.4.1.2. For inboard main tanks, 6,900 pounds in each tank is the minimum to be considered full.

12.4.1.3. Any additional fuel required will be put in the auxiliary tanks and then the external tanks.

12.4.2. This loading will satisfy the minimum requirements for primary fuel management, prevent unnecessary fuel transfers, and prevent fuel venting problems, in most cases.

12.4.3. 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.

12.5. Aircraft Structural Integrity Program (ASIP). Complete an AFTO Form 151A, **Individual C-130 Aircraft Usage Log**, IAW TO 1C- 130-101 on all flights.

12.6. Aircraft Systems/Forms Management:

12.6.1. The FE will monitor aircraft systems during all flight and ground operations. Notify the pilot of all abnormal indications and take action as required.

12.6.2. In addition to the procedures in TO 00-20-5 and AFI 11-401, the FE will assist the pilot in maintaining the AFTO Form 781.

12.7. TOLD Cards:

12.7.1. All performance calculations will be based on 95 percent engines and without nosewheel steering (unless otherwise specified in this volume). TOLD card computations will be accomplished using flight manual performance data or approved tabulated data. Initial TOLD cards will be computed using flight manual performance data. All tabulated TOLD data will be forwarded to the respective NAF/OV for approval prior to use. NAF/OV will maintain a copy of all approved tabulated data.

12.7.2. 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.

12.7.3. When stop-and-go operations are planned, the FE will compute two refusal distances, one based on 970 degrees TIT and one based on maximum power.

12.7.4. 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.

12.7.5. The minimum TOLD computations (airspeeds) required for a termination landing are: air minimum control speeds, obstacle clearance speed, three engine climb speed, and 50 percent and 100 percent landing speeds.

12.8. Flight Engineer (FE) Abbreviations and Formulas:

12.8.1. General Abbreviations. Contained in **Attachment 1** of this AFI.

12.8.2. Standard Formulas:

12.8.2.1. Time, Speed and Distance formulas.

12.8.2.1.1. DISTANCE = (SPEED X TIME in min) ³ 60.

12.8.2.1.2. SPEED = (DISTANCE X 60) ³ TIME in min.

12.8.2.1.3. TIME in min = (DISTANCE X 60) ³ SPEED.

12.8.2.1.4. SM = NM X 1.152.

12.8.2.1.5. NM = SM ³ 1.152.

12.8.2.1.6. TASK = EASK X SMOE

12.8.2.1.7. EASK = TASK ³ SMOE.

12.8.2.2. General Fuel Formulas.

12.8.2.2.1. Pounds = Gallons X Fuel density.

12.8.2.2.2. Gallons = Pounds ³ Fuel density.

12.8.2.2.3. F/Pd =(FF X TIME in min) ³ 60.

12.8.2.2.4. FF = (F/Pd X 60) ³ TIME in min.

12.8.2.2.5. DISTANCE = NMPP X F/Pd.

12.8.2.2.6. NMPP = DISTANCE ³ F/Pd.

12.8.2.2.7. F/Pd = DISTANCE ³ NMPP.

12.8.2.2.8. FF = TASK ³ NMPP.

12.8.2.2.9. TASK = NMPP X FF.

12.8.2.2.10. F/Pd = (FF X DISTANCE) ³ TASK.

12.8.2.2.11. Charted TASK = Logged TASK ³ SMOE for cruise altitude.

12.8.2.2.12. Charted FF = FF ³ SMOE for cruise altitude.

12.8.2.2.13. ×F = 1.8 C + 32, ×C = (×F -32) ³ 1.8.

12.8.2.3. Weight and Balance Formulas.

12.8.2.3.1. Arm = Moments ³ Weight.

12.8.2.3.2. Moments = Arm X Weight.

12.8.2.3.3. Weight = Moments ³ Arm.

12.8.2.3.4. Average Arm = Total Moment ³ Total Weight.

12.8.2.3.5. CG (% of MAC) = (Average Arm - LEMAC) ³ MAC.

12.9. Tactical Checklists. When the pilot or navigator, as required, initiates a tactical checklist, the FE will read and ensure timely completion of all checklist items.

Section 12B—Hostile Environment Repair Procedures

12.10. 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.

12.11. Hostile Environment Repair Kit (HERK). Safe and efficient accomplishment of the hostile environment repair procedures requires a complete repair kit as prescribed in **Table 12.1.** Units will identify repair kit inventory and issue procedures, in **Chapter 10**.

CAUTION: When installing or removing recommended jumper wires electrical arcing is possible.

12.12. 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.

NOTES:

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 **12.13.**)

12.12.1. Jumping Battery--Aircraft to Aircraft:

12.12.1.1. Position aircraft nose to nose to allow the DC power cable (or cables) to reach.

12.12.1.2. Join both aircraft DC power cables by use of extender plug or brass bars listed in **Table 12.1.**

12.12.1.3. Place cable from operating aircraft DC winch receptacle to external DC power receptacle of disabled aircraft.

12.12.1.4. 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.

12.12.1.5. Start GTC on disabled aircraft.

12.12.1.6. ATM and Generator Switch - ON.

12.12.1.7. Jump battery relay using failed battery relay procedure. (See paragraph **12.15.**)

12.12.1.8. When battery relay is closed, remove jumper cables and continue with checklist.

12.12.2. 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.)

12.12.2.1. 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 12.1.**).

12.12.2.2. Insert stock into battery connector for option one.

12.12.2.3. Connect jumper cables to aircraft and batteries.

12.12.2.4. 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.

12.12.2.5. Start GTC.

12.12.2.5.1. Control Switch - Start, Run.

12.12.2.5.2. Bus Tie Switch - Tied.

12.12.2.6. ATM and generator - ON, checked.

12.12.2.7. If option two was utilized, jump battery relay using failed battery relay procedure. (See paragraph **12.15.**)

12.12.2.8. Start an engine and place the generator switch to ON.

12.12.2.9. Disconnect jumper cables.

12.13. 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.

12.13.1. If the aircraft battery is damaged, disconnect and remove it from the aircraft. Use caution to avoid acid burns if the battery is leaking.

12.13.2. Open the Pilot's upper circuit breaker panel.

12.13.3. 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 12.8.**).

12.13.4. Check the DC voltmeter in the ESS DC BUS position to verify the bus is powered.

12.13.4.1. If the ESS DC BUS is not powered, bypass the relay as follows:

12.13.4.1.1. Remove all power from the aircraft.

12.13.4.1.2. Disconnect the INS battery.

12.13.4.1.3. 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 12.8.**).

12.13.4.1.4. Connect the INS battery.

12.13.5. Start GTC.

WARNING: Fire protection is not available for the GTC, until the Battery Relay is jumped.

12.13.5.1. Place Bleed Air Valve switch to OPEN.

12.13.6. Place ATM and generator switch to ON. Check Voltage and Frequency.

12.13.7. Remove #10 jumper wire from the INS Reverse Current Relay (RCR).

12.13.8. Jump the battery relay using Failed Battery Relay procedure. (See paragraph **12.14.**)

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.

12.14. Failed Battery Relay:

12.14.1. DC power switch--BATTERY.

12.14.2. Jump battery relay by momentarily touching terminals "A-1" to "A-2" using the #10 jumper wire (see **Figure 12.2.**).

12.14.3. Check the battery voltage on voltmeter to verify closing of relay. (The voltmeter should read bus voltage.)

12.14.4. If battery relay fails to close, bypass the relay as follows:

12.14.4.1. Remove all power from the aircraft.

12.14.4.2. Disconnect the aircraft battery and INS battery.

12.14.4.3. Install a #4 jumper wire between terminals "A-1" and "A-2."

12.14.4.4. 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

12.15. Failed RCR between Isolated and Essential DC Bus:

12.15.1. Open pilot's side circuit breaker panel.

12.15.2. Install a #10 jumper wire between the SW post and the APP post (see **Figure 12.2.**).

12.15.3. If the RCR fails to energize, bypass the relay as follows:

12.15.3.1. Remove all power from the aircraft.

12.15.3.2. Disconnect the aircraft battery.

12.15.3.3. Install a #4 jumper wire between the BATT and GEN terminals (see **Figure 12.2.**).

12.15.3.4. 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.

12.16. *GTC Stalls and Fails to Accelerate to "On Speed:"

12.16.1. Hold fingers over the acceleration limiter holes (see **Figure 12.3.**) 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.

12.17. GTC Fails to Rotate (No Start Light):

12.17.1. 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.

12.17.2. 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 dip stick, etc.). Disconnect door actuator cannon plug and install jumper wire from pin "D" to pin "E" and attempt restart.

12.17.2.1. 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.

12.17.3. 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.

12.17.3.1. When finished with GTC, close and secure the doors using two of the four bypass switch mounting bracket screws.

12.17.4. 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.

12.17.4.1. Start GTC.

12.18. GTC Fails to Rotate (Start Light On):

12.18.1. Remove all electrical power.

12.18.2. Open pilot's side circuit breaker panel.

12.18.3. Check GTC starter current limiter; (see **Figure 12.2.**) if bad or suspect; replace as follows:

12.18.3.1. Disconnect battery.

12.18.3.2. Remove and replace current limiter with spare.

12.18.3.3. If no spares are available, open copilot's upper circuit breaker panel cover, remove cargo winch current limiter and use as a replacement.

12.18.4. If current limiter is good, check GTC starter for broken wires and repair as necessary (see **Figure 12.3.**).

12.18.5. Connect battery and attempt to start. If no rotation, rap starter relay and attempt another start.

12.18.6. 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 12.2.**) until the start light goes out, then remove the jumper wire.

12.19. *GTC Fuel Vapor Lock:

12.19.1. Use petcock drain on bottom of aircraft below GTC to drain fuel while motoring GTC, then attempt start (see **Figure 12.4.**).

12.19.2. If no fuel is present at petcock drain, check GTC fuel shutoff valve opening by momentarily positioning GTC control switch to "START" then "OFF".

12.19.3. If fuel shutoff valve fails to operate, remove cannon plug and open the valve manually.

12.19.4. 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.

12.19.5. Reconnect the line and attempt another start.

12.20. *GTC Rotates - Negative Ignition:

12.20.1. Check oil quantity.

12.20.2. Attempt a start while depressing and holding the oil primer button. Release the button when the GTC lights off.

12.21. Starting GTC with Failed Oil Pressure Switch:

12.21.1. 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 12.3.**)

12.21.2. Remove oil line to the oil pressure switch and momentarily rotate GTC. (Oil should spurt from the line opening.)

12.21.3. 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.

12.21.4. Attempt to start the GTC. If the oil pressure switch was faulty the start should be successful.

12.22. Leaking Brakes:

12.22.1. Disconnect brake lines from both sides of the brake shuttle valve.

12.22.2. Use plugs and caps from the HERK kit to seal the brake lines and shuttle valve.

12.22.3. 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.

12.23. 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.

12.23.1. Install main gear towing/jacking fitting on the strut with the flat tire.

12.23.2. Install a 10,000-pound chain around the top of the strut above the upper track shoes.

12.23.3. Connect a tiedown device to the towing fitting. Connect the chain to the device and tighten.

12.23.4. 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.

12.23.5. 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.

12.23.6. When the strut has been compressed to the maximum extent possible, tighten the tiedown device.

12.23.7. Remove the flat tire if time and situation permits.

12.23.8. 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.

12.24. Failed Engine Driven Hydraulic Pump:

12.24.1. Disconnect the failed engine driven hydraulic pump from the gearbox and secure to any available structure with safety wire. Do not disconnect hydraulic lines.

12.24.2. Install a starter pad in place of the failed hydraulic pump.

12.24.3. If time and resources permit, the pump may be removed from the nacelle as follows:

12.24.3.1. With the ESS DC bus powered, place the corresponding hydraulic pump switch to the OFF position. This will close the hydraulic shutoff valve.

12.24.3.2. Disconnect and plug all hydraulic lines to the pump.

12.24.3.3. 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.

12.25. Failed Fuel Valve(s):

12.25.1. Locate the failed valve(s) and remove the cannon plug(s).

12.25.2. 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.

12.26. Failed Speed Sensitive Switch:

12.26.1. Pull Ignition Control Circuit Breaker on Copilots Lower Circuit Breaker Panel.

12.26.2. Open lower left side engine cowling on the affected engine.

12.26.3. Remove the speed sensitive control cannon plug (see **Figure 12.5.**).

12.26.4. Install the pre-wired cannon plug from the Hostile Environment Repair Kit and secure it in place (see **Figure 12.5.** and **Figure 12.7.**).

CAUTION: Pre-wired cannon plugs used as jumpers must be wired as shown in **Figure 12.7.**

12.26.5. Secure all engine cowling.

12.26.6. Begin the start sequence (in normal ground idle) while watching tachometer.

12.26.7. At 16% engine RPM, reset the Ignition Control Circuit Breaker.

12.26.8. 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.

12.26.9. After landing, use normal ground idle only and shutdown the affected engine as follows:

12.26.10. Ignition Control Circuit Breaker - RESET.

12.26.11. 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.

12.26.12. When the fuel flow indicator drops to zero and RPM is decreasing, pull the Ignition Control Circuit Breaker.

12.27. Failed Ignition Control Relay:

12.27.1. Pull the Ignition Control circuit breaker.

12.27.2. Open the lower left engine cowling and locate the ignition control relay (see **Figure 12.5.**).

12.27.3. 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 12.7.**

12.27.4. Close and secure cowling.

12.27.5. During engine start proceed as follows:

12.27.5.1. At 16 percent RPM, reset the Ignition Control circuit breaker.

12.27.5.2. At 65 percent RPM, pull the Ignition Control circuit breaker.

12.27.6. For engine shutdown following landing, proceed as follows:

12.27.6.1. Reset the Ignition Control circuit breaker.

12.27.6.2. Place the condition lever to GROUND STOP.

12.27.6.3. When fuel flow drops to zero and RPM decreases, pull the Ignition Control circuit breaker.

12.28. Failed Speed Sensitive Valve:

CAUTION: This procedure will render the torquemeter shroud anti-icing system inoperative. Icing conditions should be avoided.

12.28.1. Open the lower left side engine cowling on the affected engine.

12.28.2. Disconnect the air supply line to the speed sensitive valve (see **Figure 12.5.**) at the bottom of the filter element installed in the line and install a #6 plug in the open line.

12.28.3. Disconnect the torquemeter shroud anti-icing line at the left side of the balance line fitting and secure it.

12.28.4. 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.

12.28.5. 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.

12.28.6. Place the Engine Inlet Duct Anti-icing switch for the affected engine to ON.

12.28.7. Start the affected engine while watching RPM and standing by to activate the Prop and Engine Anti-icing Master switch.

12.28.8. 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.

12.28.9. 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.

12.29. Failed Fuel Shutoff Valve on Fuel Control:

12.29.1. Open lower left side cowling on affected engine.

12.29.2. Remove the defective fuel control shutoff actuator (Geneva lock) from the fuel control (see **Figure 12.5.**).

12.29.3. 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.

12.29.4. 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.

12.29.5. For engine shutdown, place the condition lever to FEATHER rather than GROUND STOP for the affected engine.

12.30. Failed Engine Fuel Drip Valve:

12.30.1. Use enrichment on next engine start. The sudden surge of pressure should close the drip valve.

12.30.2. If enrichment fails to close the drip valve, shutdown the engine and plug or crimp the drip valve drain valve closed.

12.31. Prop Fails To Rotate (No Light In Button):

CAUTION: Insure the oil shutoff valve circuit breaker is set (in).

12.31.1. If it is determined or suspected that no power is available to the starter button, proceed as follows:

12.31.1.1. Select another engine which is not operating and close its bleed air valve. (This bleed valve must remain closed throughout the start cycle.)

12.31.1.2. 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.

12.32. Alternate Fuel Management with Inboard Main Tanks Empty (External Tanks Containing Fuel):

12.32.1. The external tanks may be filled to maximum capacity provided the outboard main tanks and both auxiliary tanks are full.

12.32.2. 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.

12.32.3. As soon as practical after takeoff, close the cross-feed separation valve and place all engines on cross-feed from the auxiliary tanks.

12.32.4. 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.

12.32.5. 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.

12.32.6. When the auxiliary tank fuel is 1,000 pounds per side, open the outboard cross-feed valves to place all engines on cross-feed.

12.32.7. When the auxiliary tanks are empty, close the auxiliary tank cross-feed valves and place the auxiliary tank fuel boost pump switches to OFF.

12.32.8. Observe flight manual touch down rate of sink and outboard tank fuel quantity landing limitations.

12.32.9. 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.

12.33. Failed Bleed Air Valve (Engine Fails To Rotate):

12.33.1. Place the bleed air valve switch to "OPEN." Open horse collar and "tap" the motor mechanism on the bleed air valve.

12.33.2. 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.

12.33.3. Close the horse collar and attempt engine start.

12.34. Severe Fuel Leaks:

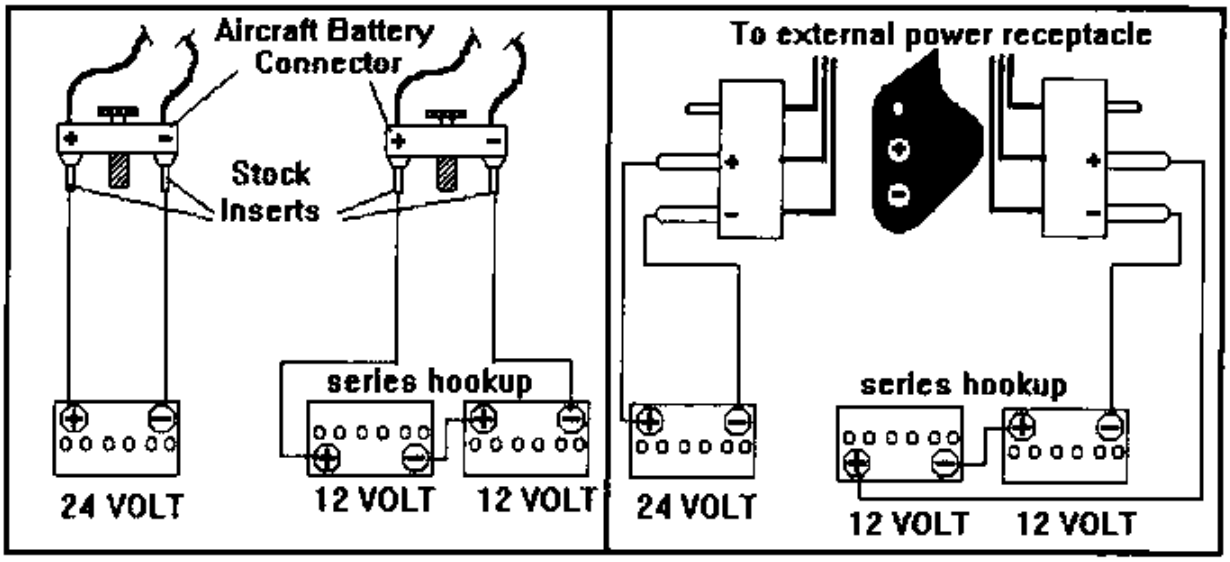
12.34.1. Fuel leaks caused from punctures or small arms fire can be plugged by using the wooden plugs and Pig Putty from the kit. If a high number of plugs are used, it may be necessary (as time permits) to break or cut them off near the wing surface to reduce drag.

Table 12.1. Hostile Environment Repair Kit Parts List.

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

ITEM	STOCK NUMBER
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 12-5.	

Figure 12.1. Alternate DC Power Connections.



OPTION ONE **OPTION TWO**

Figure 12.2. Reverse Current Relay.

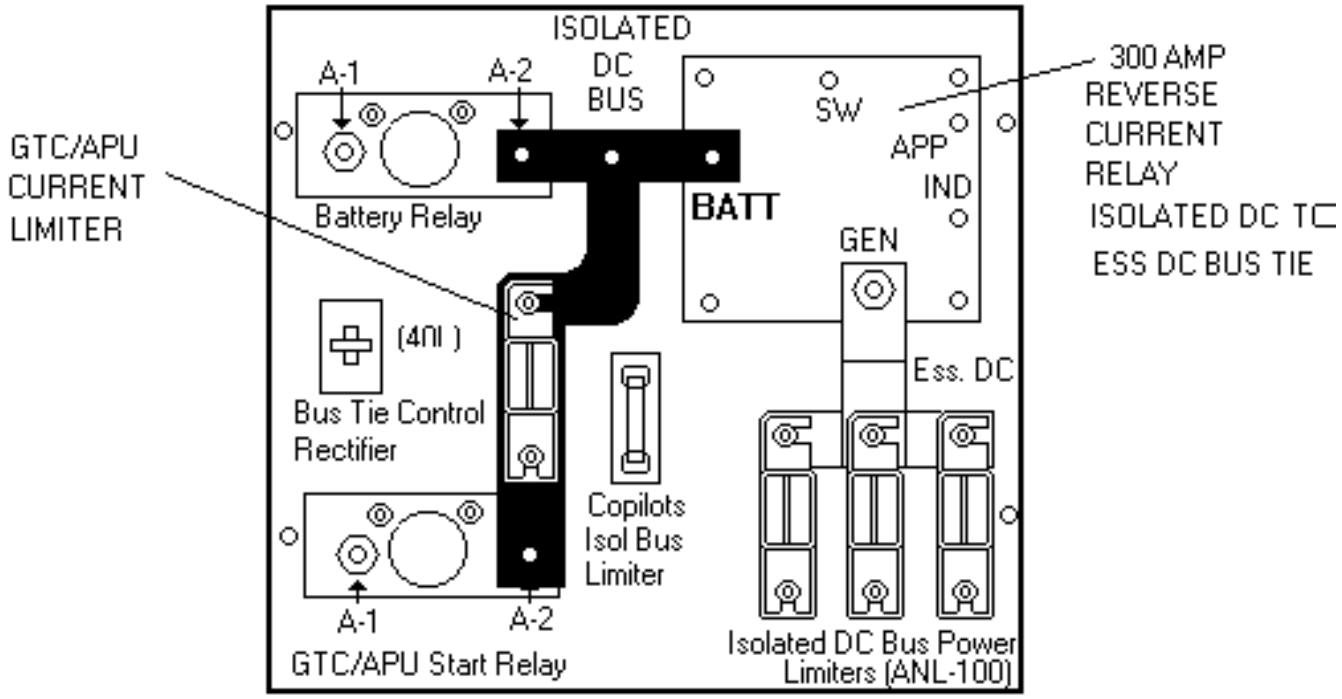


Figure 12.3. Gas Turbine Compressor.

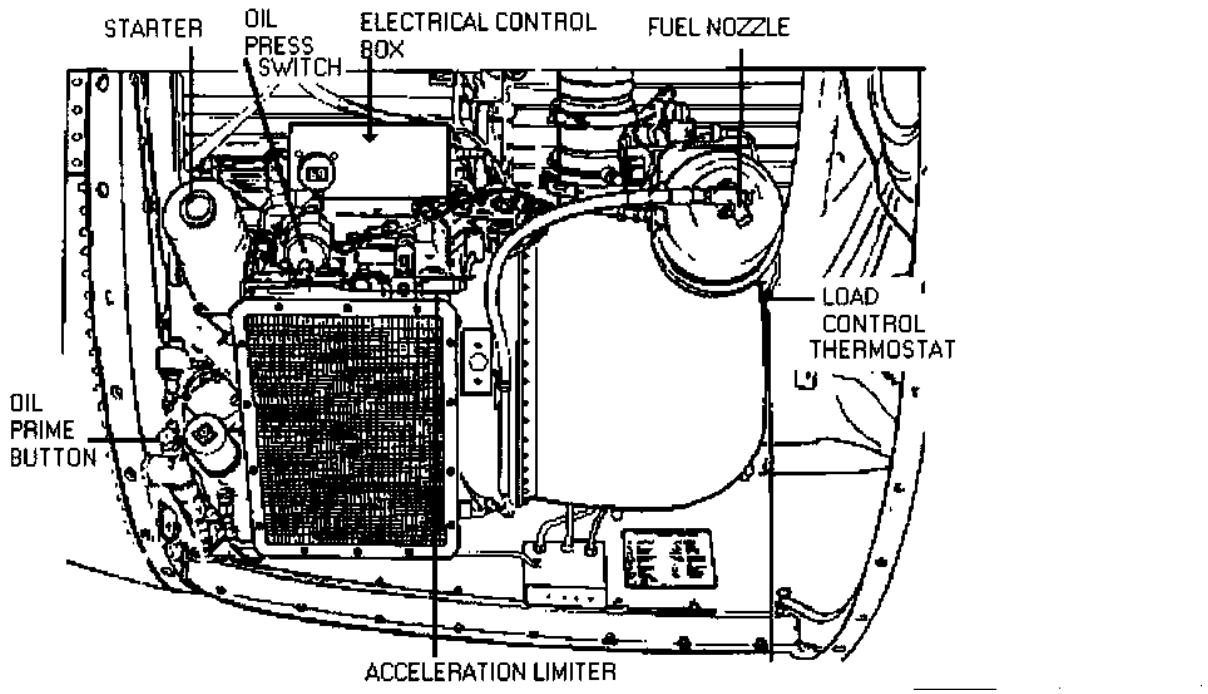


Figure 12.4. GTC Fuel Supply.

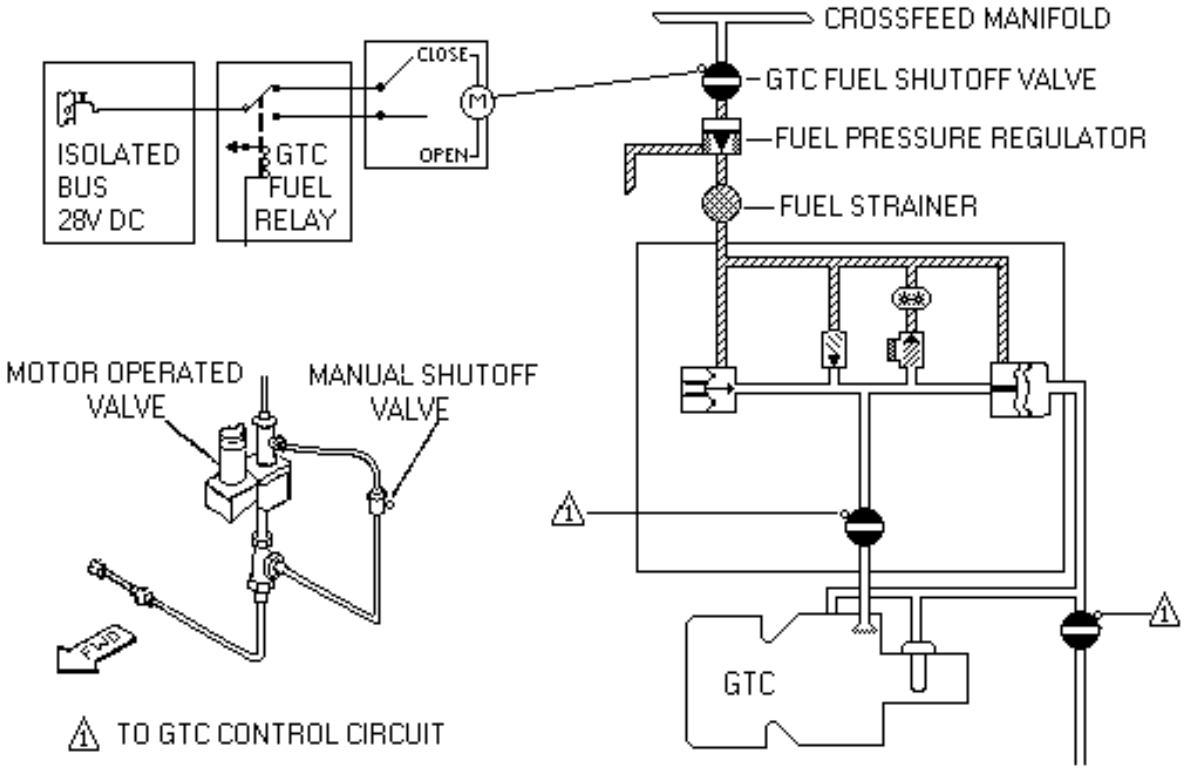


Figure 12.5. Engine Accessory Locations.

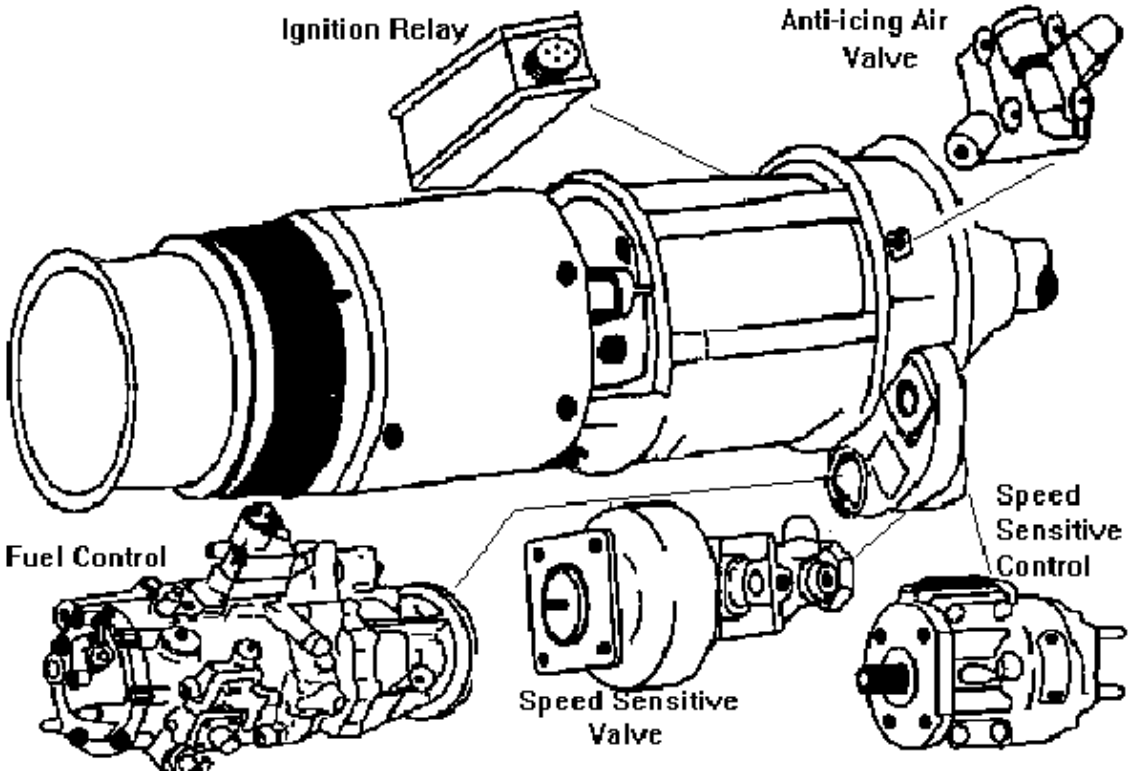


Figure 12.6. Gear Box Accessory Locations.

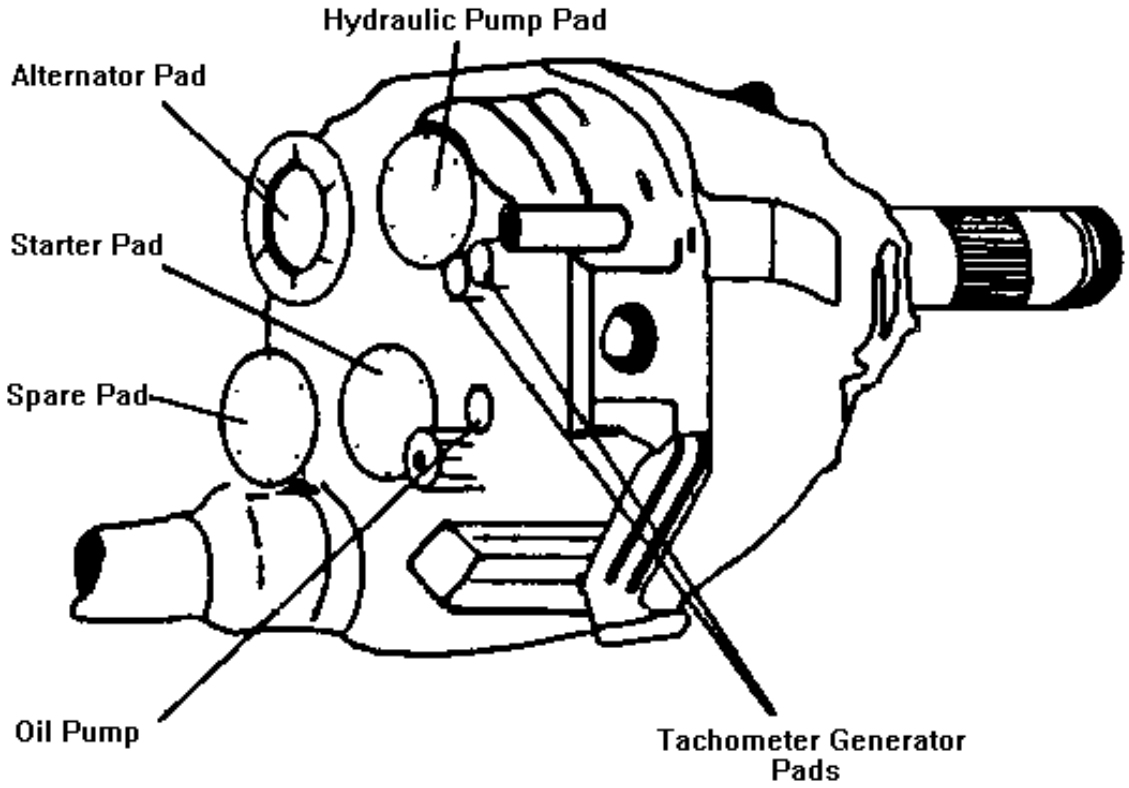
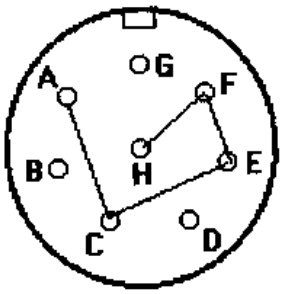


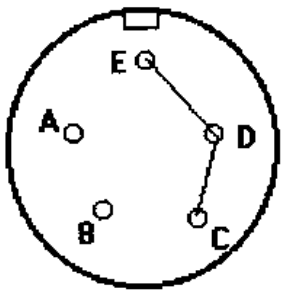
Figure 12.7. Prewired Cannon Plugs (Speed Sensitive Control and Ignition Relay).

Speed Sense Control
Pin A to C to E to F to H
16 Ga. Wire



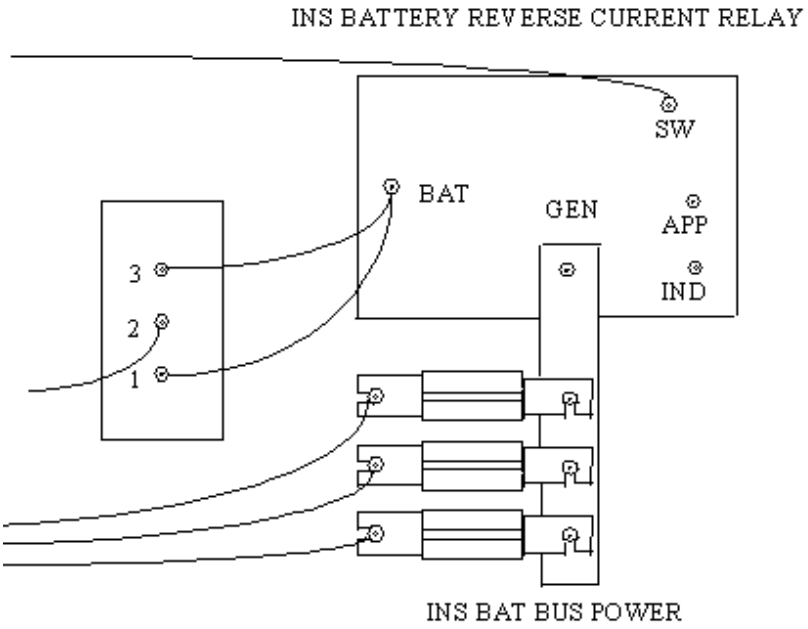
MS 3101A18-8p
A- Power
C- Fuel Shutoff (Open)
E- Ignition Relay
F- TD Sys (Start Limit)
H- Enrichment

Ignition Relay
Pin C to D to E
16 Ga. Wire



C - Power
D- Ignition Exciter and Drip Valve
E- Misc

Figure 12.8. Bypassing the INS Reverse Current Relay.



Chapter 13

AIRBORNE MAINTENANCE TECHNICIAN (AMT)/SCANNER PROCEDURES

13.1. General. The AMT/Scanner is responsible to the AC for management of the cargo compartment and ABCCC Capsule/Compass Call mission equipment. The AMT/Scanner is responsible for aircrew members stationed in the cargo compartment/Capsule, and any passengers. The AMT/Scanner will:

13.1.1. Remain in the cargo compartment/capsule for takeoffs and landings when passengers are on board.

13.1.2. Perform and supervise scanner duties.

13.1.3. Coordinate mission equipment requirements and any special procedures necessary to ensure optimum mission accomplishment.

13.1.4. Initialize, maintain, and troubleshoot mission systems during flight as required.

13.1.5. Document all write-ups in aircraft forms and thoroughly debrief appropriate ground personnel.

13.1.6. Ensure MEGPs and passengers have appropriate life support equipment and are briefed on emergency procedures, seated prior to stations time.

13.1.7. Complete anti-hijacking procedures for all passengers.

13.1.8. Ensure the GTC is shutdown prior to en-planning or de-planning passengers unless proper hearing protection is used.

13.2. Weight and Balance. The FE will calculate all weight and balance data, unless a certified loadmaster has been added to the crew.

13.3. Emergency Exits and Safety Aisles:

13.3.1. When passengers are seated in side facing seats, the AMT/Scanner will ensure there is sufficient space between the cargo and the seats to permit passenger legroom.

NOTE: All passenger handcarried items must be of a size to fit under the seat and must not obstruct the safety aisle. Any items that do not fit under a seat or obstruct an aisleway will be stowed with checked baggage and secured for flight.

13.3.2. At least one unobstructed emergency exit is available for each 20 passengers. (This does not restrict over water flights if the three overhead escape hatches are available for egress.) Seats erected across an emergency exit are not considered as an obstruction.

13.4. Passenger Handling:

13.4.1. The AMT/Scanner is the key figure for good passenger relations. There are certain rules that should be observed:

13.4.1.1. Address passengers by proper titles.

13.4.1.2. Avoid arguments and controversial subjects, national or international politics, criticism of other personnel or organizations.

13.4.1.3. Offer services or perform duties in a manner indicating a personal interest and willingness to help.

13.4.2. Comments by the AMT/Scanner and the manner in which they are made often determine passenger attitudes about the flight. Always remember that passengers are individuals; address them collectively only when making announcements.

13.4.3. In-flight Procedures:

13.4.3.1. Passengers may move about the cabin/capsule 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.

13.4.3.2. Make frequent checks on the following:

13.4.3.2.1. Cabin/capsule temperature.

13.4.3.2.2. Passengers with small children.

13.4.3.2.3. Cleanliness of the cabin and lavatories.

13.4.3.3. Do not allow passengers to tamper with emergency equipment. Passengers will not be permitted access to checked baggage.

13.4.3.4. On long flights, particularly during hours of darkness, use all possible means to make passengers comfortable. Dim and extinguish unnecessary compartment/capsule lights.

13.4.3.5. Passengers may visit the flight deck only when approved by the AC. Use good judgment when requesting this authority.

13.4.3.6. Sponsors must accompany children under 15 at all times during the flight.

13.4.3.7. When passengers are carried, an AMT/Scanner will be in the cargo compartment/Capsule for all takeoffs and landings. No more than 40 passengers will be scheduled to be carried (except during unit moves or contingencies).

13.4.3.8. The AMT/Scanner will insure sufficient fresh water is available for the crew and passengers IAW **Table 13.1.**

Table 13.1. Drinking Water Requirements.

NUMBER OF PERSONNEL	6 HOURS OR LESS	6 TO 9 HOURS	9 OR MORE HOURS
4 - 8	2 gal	4 gal	4 gal
9 - 21	6 gal	6 gal	8 gal
21 - 40	8 gal	10 gal	12 gal

Chapter 14

FUEL PLANNING

14.1. General. This chapter provides general fuel planning considerations and procedures. Publish local procedures in **Chapter 10**.

14.2. Fuel Conservation:

14.2.1. 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.

14.2.2. Extra fuel (identified extra) may be added to RRFL:

14.2.2.1. When fuel availability is limited or not available at en route stops.

14.2.2.2. For known holding delays in excess of standard.

14.2.2.3. For anticipated off course weather avoidance.

14.2.3. To maximize fuel, consider the following:

14.2.3.1. Use optimized CFPs when possible.

14.2.3.2. Long-range cruise (LRC) and/or optimum altitude should be flown (when possible).

14.2.3.3. Limit the use of the APU/GTC when possible.

14.2.3.4. Delay engine start.

14.2.3.5. Cruise CG should be aft if practical.

14.2.3.6. Fly en route descents when possible.

14.2.4. Fuel Loads:

14.2.4.1. Use appropriate flight planning software or TO 1C-130H-1-1 for fuel planning. Use 100 percent engine and constant altitude performance. With the exception of those items explained in paragraphs **14.2.5.** and 14.2.5.1., all items of the fuel analysis portion of AF Form 4116, **C-130 Flight Plan and Record**, are explained in **Table 14.1.**

14.2.5. If fuel is computed using TO 1C-130H-1-1, use the appropriate drag index.

14.3. Fuel Planning:

14.3.1. Entering Arguments:

14.3.1.1. Weight. Add OPERATING WT, CARGO/ PAX WT, and RAMP FUEL to obtain RAMP WT. Subtract TAXI fuel to obtain TAKEOFF WT.

14.3.1.2. TEMP DEV - Temperature Deviation. Compare the forecast temperature at cruise altitude to the standard temperature for that altitude. The algebraic difference is TEMP DEV.

14.3.2. Fuel Computations. Refer to Fuel Planning guidance in **Table 14.1.** and local **Chapter 10** for fuel computations.

Table 14.1. Fuel Load Components.

SITUATION	FUEL REQUIREMENTS
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	10% of flight time over a Category I route/segment, not to exceed 45 minutes. For orbit/search missions, 10% of flight time for that portion with inadequate NAVAIDS from the orbit/search point to destination. Compute at terminal fuel flow.
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.
HOLDING	Entry required. Minimum 2,000 lbs. If flight time over a Category II route is greater than 3+20, when an alternate is located in Alaska, alternate not available or located at latitudes greater than 59 degrees N/S, use 3,500 lbs. These holding fuel calculations meet or exceed the fuel requirements of AFI 11-202V3 2.2.3. Fuel Reserves.
APPROACH LANDING	Approach: 1,000 lbs (2,000 lbs for high altitude approach). Entry always required. **Minimum Landing Fuel:** 4,000 lbs. Entry always required.
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 en route.
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 2200 lbs. (fuel conservation)
MINIMUM DIVERSION	Total of ALTERNATE AND MISSED APPROACH, HOLDING, and APPROACH/LANDING. Will never be less than 7,000 lbs.

Chapter 15

AIR REFUELING

15.1. General. Aerial refueling (AR) operations will be performed according to TO 1-1C-1, 1-1C-1-33, 1-1C-1-3, and 1-1C-1-29. 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.

15.2. Crew Policy:

15.2.1. Co-pilots will only perform contacts with an IP in the left seat (or right seat if approved for left seat training IAW paragraph **3.1.1.3.**). When allowing a copilot to perform contacts or when an AR-qualified pilot is regaining currency, the instructor pilot must occupy either the left or right seat prior to departure from pre-contact to contact position. During initial training, the IP will occupy a pilot seat before initiation of the AR checklists.

15.2.2. Instructor pilots and pilots in instructor upgrade (under direct IP supervision) may perform boom limit demonstrations.

15.3. 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.

15.3.1. Airspace. AR may be conducted on established tracks published in FLIP, tracks published in an ATO, or random tracks coordinated between tanker and receiver.

15.3.1.1. Using an established AR 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 flight plan is completed properly.

15.3.1.2. 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.

15.3.1.3. Not using a previously identified track will usually require coordination of an Altitude Reservation (ALTRV). Plan and coordinate the ALTRV IAW FAA 7610.4J Chapter 3 and FLIP requirements. Tanker planners and TACC can provide assistance with ALTRV coordination.

15.3.1.4. In all cases, the route to and from the AR track/anchor should allow divert to a suitable abort airfield that meets the requirements of **Chapter 6** of this volume and AFI 11-202V3.

15.3.1.5. Fuel planning may be completed using either an approved computer planning program or manually using procedures in **Chapter 11**. A standard fuel flow of 6,000 PPH may be used from the ARIP to EAR.

15.3.2. Military Assumes Responsibility for Separation of Aircraft (MARSA):

15.3.2.1. Acceptance of MARSA normally is the tanker's responsibility. Normally MARSA begins prior to the receiver reaching the AR/RZIP. 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.

15.3.2.2. MARSA ends when normal separation standards are established and ATC accepts control at the end of refueling.

15.4. Procedures/Restrictions:

15.4.1. Performing AR Maneuvers. AR-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 **15.2.** 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.

15.4.2. Inflight Fuel Management. Track inflight fuel management from departure to AR abort base until EAR. When the EAR point is reached, track inflight fuel management to either DEST or the next AR abort base. Compute wind factors and ETPs IAW **Chapter 11** procedures.

15.4.3. 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 FE and nav will closely monitor fuel burn rates. Immediately bring any discrepancies between actual and expected fuel burn to the AC's attention.

15.4.3.1. 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.

15.4.3.2. 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.

15.4.4. Gross Weight Limitations. When mission requirements dictate aerial 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.

15.4.5. 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).

15.5. Communication:

15.5.1. 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 AR frequency, interphone, and flight crew hot mic. However, at least one flight deck crewmember will monitor UHF guard throughout the refueling.

15.5.2. During all ARs, 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 AR clearance issued by the tanker. If there is a discrepancy, query the ATC controller prior to accepting post-AR clearance.

15.6. Breakaway. Follow procedures in TO 1C-1-29.

Chapter 16

COMBAT MISSION PLANNING

16.1. General. Refer to the following AFTTP 3-1Volumes for details pertaining to combat mission planning:

16.1.1. Volume 1, *General Planning and Employment Considerations* (U) (Secret)

16.1.2. Volume 2, *Threat Reference Guide and Countertactics* (U) (Secret)

16.1.3. Volume 16, *Tactical Employment--EC-130H* (U) (Secret)

16.1.4. Volume 25, *Tactical EmploymentóC/HC-130* (U) (Secret)

NOTE: Though none of the above volumes specifically address EC-130E ABCCC planning, they are excellent planning references. ABCCC crews should use these references to the maximum extent practical.

16.2. Responsibility. The AC and DABS/MCC jointly share responsibility for mission planning.

Chapter 17

TACTICAL/THREAT AVOIDANCE PROCEDURES

17.1. 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.

17.1.1. This chapter deals primarily with the takeoff/departure and approach/landing phase of flight. AFTTP 3-1V16 contains a more detailed discussion of threat avoidance en route and in the orbit area.

17.1.2. 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.

17.1.3. Threats and emission control requirements permitting, use all available aids (e.g., map reading, SCNS computer, and tactical air navigation) to remain position oriented. Aircrew members share responsibility for en route 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.

17.2. Tactical Arrivals:

17.2.1. Low Altitude Arrivals (Figure 17.1.). These approaches are used primarily when a low altitude ingress is necessary, e.g., avoidance of early warning radar coverage or radar-guided surface to air missiles (SAM) near the airfield. All maneuvering is done at low altitude. These approaches can be entered from any direction at en route altitude and airspeed.

17.2.1.1. Straight In. This approach appears the simplest, but may be the most difficult to execute consistently. The lack of turns means the energy dissipation problem is one dimensional, making the timing of slowdown critical. The key to a successful approach is timing slowdown to obtain the proper configuration. Approximately 3 NMs are required to slow from 200 KIAS to threshold speed. From 250 KIAS, plan on 4.5 to 5 NMs. Tail winds or increased gross weights require an even earlier slowdown. This approach may be varied by using an angling final, a dog leg, or an entry to base using the same basic techniques.

17.2.1.1.1. Advantages:

17.2.1.1.1.1. Requires very little low-level maneuvering.

17.2.1.1.1.2. Minimum exposure to the threat environment.

17.2.1.1.2. Disadvantages:

17.2.1.1.2.1. Aircraft slows further from airfield than other types of approaches.

17.2.1.1.2.2. Precise navigation is critical to finding the runway.

17.2.1.2. Curvilinear Approach (Random Shallow). The random shallow approach is a low altitude (250 to 500 feet), high speed, VMC maneuver. It is designed as an alternate method to approach an airfield when the primary threat is from radar-guided weapons or large caliber AAA.

17.2.1.2.1. Performing the Maneuver:

17.2.1.2.1.1. Straight-in Approaches. For a straight-in (**Figure 17.1.**), a level slowdown from 250 KIAS to 120 KIAS takes approximately 4.5 NM; from 200 KIAS to 120 KIAS, it takes approximately 3.0 NM. These distances assume the aircrew configures "on airspeed to landing configuration" and allows approximately 0.5 miles at threshold airspeed. This approach appears at first glance to be the easiest but may in practice be the most difficult to execute consistently. The keys to a successful approach are initiating it at the correct time and getting configured on speed. Entry airspeed is critical. Since energy is proportional to the square of velocity, a small increase in entry airspeed can make the difference between a landing and a go around. It will take at least 3 NM to slow from 220 KIAS. From 250 KIAS, plan on 4.5 to 5 NM.

17.2.1.2.1.1.1. Advantages:

17.2.1.2.1.1.1.1. No low-level maneuvering required.

17.2.1.2.1.1.1.2. Minimum exposure to threat environment.

17.2.1.2.1.1.2. Disadvantages:

17.2.1.2.1.1.2.1. Slow airspeed throughout approach. Slowdown is initiated further from airfield than other types of approaches.

17.2.1.2.1.1.2.2. Aircraft is easily recognizable, if seen.

17.2.1.2.1.1.2.3. Possibility of high sink rates close to the ground, with low power settings.

17.2.1.2.1.1.2.4. Slowdown timing and entry parameters are critical.

17.2.1.2.1.1.2.5. Navigation is critical since acquisition of the landing zone is more difficult.

17.2.1.2.1.2. The Teardrop Approach Variation. The teardrop (**Figure 17.1.**) is very similar to a circling approach to the opposing runway; the primary difference is that the random shallow is entered at en route airspeed rather than fully configured with energy dissipating throughout the approach. In addition, a 300-feet pattern altitude is somewhat lower than most circling approaches. Start slowing down about 1 NM from the approach end, with 30 degrees displacement from the runway axis. Turn base when the aircraft is even with the landing threshold.

17.2.1.2.1.2.1. Advantages:

17.2.1.2.1.2.1.1. Pattern is flexible enough to allow adjustments to manage energy and still stay within close proximity to the airfield.

17.2.1.2.1.2.1.2. Allows conversion from a straight-in to the opposite runway while maintaining ingress airspeed until close proximity to the airfield.

17.2.1.2.1.2.1.3. Runway acquisition is about the same as a straight-in, but less precision is needed due to a more flexible pattern.

17.2.1.2.1.2.2. Disadvantages:

17.2.1.2.1.2.2.1. Maneuvering at low altitude and airspeed.

17.2.1.2.1.2.2.2. The usual "picture" is likely to result in too tight of a pattern and an overshoot.

17.2.1.2.1.3. The Abeam Approach Variation. The abeam approach (**Figure 17.1.**) offers flexibility and keeps the aircraft as close to the field as any of the others. Approach from abeam the runway sets the aircrew up for landing in either direction and allows reconnaissance of the field as it is flown over. The key parameters are field crossing at 220 KIAS, initiate base turn at not more than 150 KIAS, flaps set to 50 percent, and landing gear in transit. If the pattern is entered with more than 220 KIAS, a downwind extension is likely.

17.2.1.2.1.3.1. Advantages. Ingress airspeed maintained until over the airfield; easily adapted to landing either direction; constant turning degrades the aircraft as a target; the runway is wider when approached from the beam, reducing the precision required for navigation.

17.2.1.2.1.3.2. Disadvantages. Considerable maneuvering in close proximity to the ground with decaying airspeed. Possible loss of position awareness during turn to downwind; visual contact may be lost passing the runway.

17.2.1.2.1.4. The Spiral Approach Variation. A variation to the abeam approach is the spiral approach. The spiral approach allows pattern entry at maximum airspeed but requires planning to ensure entry is within the required parameters. The pattern is a continuous energy decay maneuver, and each of the previous patterns is included in the spiral. The pattern allows a depletion of energy and the ability to land in the absolute minimum time. The key parameters for this approach are offsetting the aircraft 1 NM abeam the touchdown zone at 250 KIAS, crossing the runway at 90 degrees and 220 KIAS, and 150 KIAS with flaps 50 percent and gear in transit before starting the base turn.

17.2.1.2.1.4.1. Advantages. Maintains higher airspeed until very close to the airport; constant turning while changing airspeed and configuration degrades the aircraft as a target and provides flexibility for energy management.

17.2.1.2.1.4.2. Disadvantages. Maneuvering close to the ground; possible loss of position awareness as the runway passes to the 6 o'clock position; pattern entry point is difficult to determine.

17.2.2. High Altitude Approaches (Figure 17.2.). These approaches are used primarily when a high or medium altitude ingress is necessary (e.g., small arms environment and a permissive high or medium altitude threat environment exists), thus allowing some reconnaissance of the field as you fly over. Initial altitude, airspeed, and heading are based on the threat.

17.2.2.1. Overhead. 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.

17.2.2.1.1. Advantages. Expedites arrival; keeps airspeed high until overhead the airfield.

17.2.2.1.2. Disadvantage. Aircraft is easily observed.

17.2.2.2. Random Steep. The random steep approach (**Figure 17.2.**) is a high altitude maneuver, conducted in VMC. It is designed as an alternate method to approach an airfield when small arms are the primary threat and the field perimeter security is limited (usually 1 to 3 miles radius) or when terrain does not permit a normal traffic pattern.

17.2.2.2.1. Advantages of the random steep approach include rapid descent to reduce exposure time, continuous turns and descent to compound tracking, and minimized over-flight of the threat area.

17.2.2.2.2. The disadvantage of the random steep approach is that it requires careful pre-planning to perform properly.

17.2.2.2.3. Plan slowdown for configuration approximately 4 miles from the break. Remember to use actual ground speed and drift at altitude.

17.2.2.2.4. Prior to the break, select prominent ground features to aid in staying within the "protected" airspace when the runway is not in sight. Additionally, get the picture of altitude versus runway length. Remember, a 6,000 foot strip at 10,000 ft AGL could look the same as a 3,000 foot strip at 5,000 ft AGL.

17.2.2.2.5. Review the low key or final base turn MSL altitude. As a technique, add field elevation plus 2,000 feet.

17.2.2.2.6. Review flight characteristics and Dash 1 limitations.

17.2.2.2.7. Wings level descent at 140 KIAS is about 2,500 fpm.

17.2.2.2.8. Configured, at 140 KIAS, 45 degrees of bank, the turn radius is charted at 1,900 feet, which means that the aircraft should be no farther from the runway centerline than 3,800 feet (.625 NM). In addition, the aircraft is turning at a rate of 7.5 degrees per second, which means that a 180-degree turn will be completed in 22 seconds. During that interval, the aircraft will descend at least 1,650 feet. See **Figure 17.2.**

17.2.2.2.9. Turn radius for 30 degrees of bank is about 3,200 feet with a rate of turn of approximately 4.5 degrees per second. A 360-degree turn will lose approximately 3,700 feet (90 seconds at 2,500 fpm).

17.2.2.2.10. Plan roll-out on final between 0.5 and 1 mile at approximately 300 to 600 feet AGL. This will provide a comfortable glide path.

17.2.2.3. 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. The most common types of approaches include the following.

17.2.2.3.1. A modified 360-degree turn initiated at 4,500 feet AGL and 140 KIAS.

17.2.2.3.2. A 270-degree turn to base and 140 KIAS.

17.2.2.3.3. An opposite direction approach initiated at 3,500 feet AGL and 140 KIAS.

17.3. Departures:

17.3.1. Low Altitude Departure. This departure is used when a low altitude escape is necessary, e.g. avoidance of early warning radar coverage or radar-guided SAMs. Accelerate to en route airspeed while climbing to en route altitude and turn to departure heading.

17.3.2. High Altitude Departure. This departure is used when a high or medium altitude escape is necessary, e.g., a small arms threat and a permissive high or medium altitude threat environment exist. Fly a climbing spiral at 140 KIAS or 50-percent flap approach speed whichever is higher. Upon reaching a safe altitude, retract the flaps, accelerate, and continue climb at charted climb speeds. Actual time to climb will increase proportionally with bank angle. Therefore, use the minimum bank angle required to remain within the confines of the field boundary speed with flaps 50-percent.

Figure 17.1. Low Altitude Approaches.

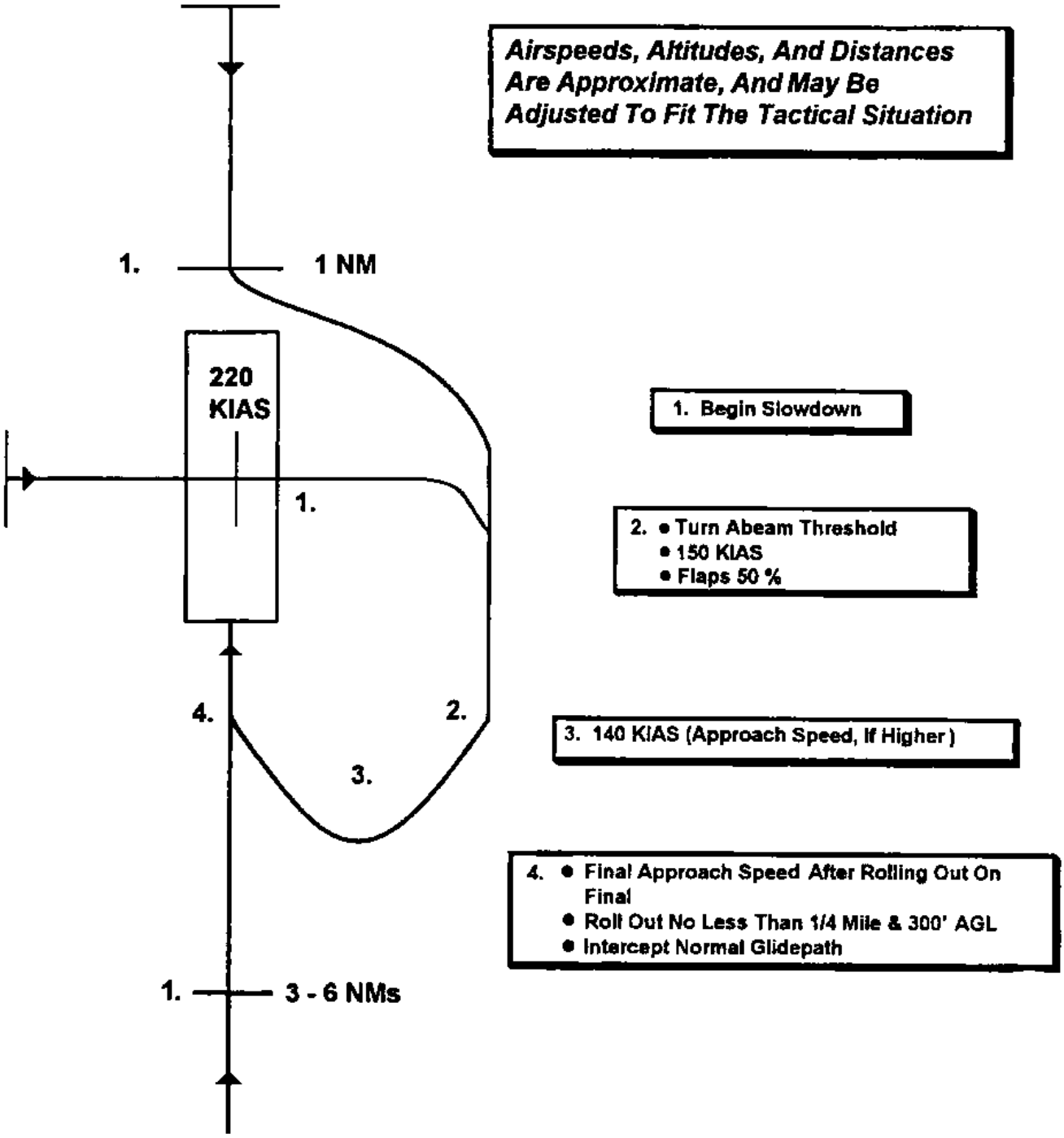
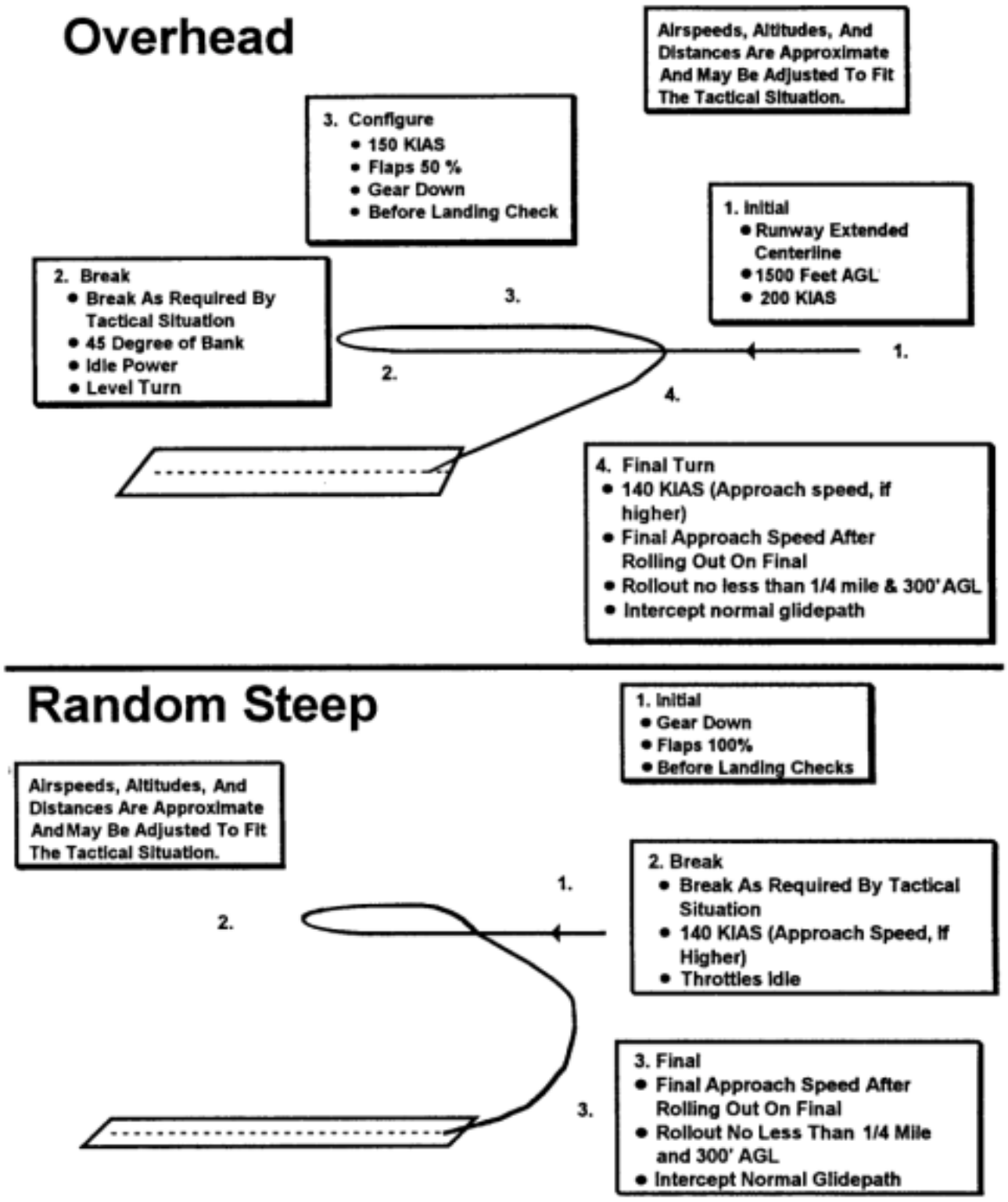


Figure 17.2. High Altitude Approaches.



17.4. 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.

17.5. Engine Running Onload and Offload (ERO) Procedures. Use ERO procedures when necessary to expedite aircraft movement, meet time requirements of unit moves and contingencies, or enhance crew duty day. ERO procedures will also be used when dropping off the mission crew/battle staff prior to pilot proficiency training. The aircraft commander is responsible for prior coordination with the controlling agency for early takeoffs. Aircraft commanders must assess prevailing weather, lighting and parking location to ensure safe operations. EC-130E aircraft will use the crew entrance door only, when the capsule is installed.

WARNING: Do not onload or offload through the crew entrance door and cargo ramp and door at the same time. Paratroop doors will not normally be used.

NOTE: At their discretion, ACs may ERO any category of passenger. The number of passengers and amount of baggage to be onloaded or offloaded should be taken into consideration. The well being of the passengers and crew is the primary concern at all times.

17.5.1. General Procedures:

17.5.1.1. ACs will brief aircrew members on the intended ERO operation.

17.5.1.2. The parking brake will be set and at least one pilot in the seat will monitor brakes, interphone, and radio.

17.5.1.3. As a technique, operate engines in low speed ground idle, lower flaps (or position as required), to reduce prop blast aft of the aircraft.

17.5.1.4. Use wing leading edge and taxi lights to enhance safety at night as the situation dictates.

17.5.2. Personnel On/offload Through the Aft Cargo Door and Ramp.

17.5.2.1. Aerial delivery support (ADS) arms may be disconnected during descent checklist. Prior to landing, the AMT/Scanner will brief all personnel in the cargo compartment regarding their locations, duties, and responsibilities during the ERO.

17.5.2.2. After the aircraft is off the runway and slowed to taxi speed, the AMT/Scanner may open the aft cargo door and lower the ramp to approximately 12 inches above horizontal.

17.5.2.3. After clearance from the pilot, the AMT/Scanner lowers the ramp, and remains on headset to direct onload or offload operations.

17.5.2.3.1. The AMT/Scanner will direct all onload and offload operations using pre-briefed signals. Other qualified aircrew members may perform these duties; however, the AMT/Scanner retains overall responsibility for the operation.

17.5.2.3.2. An aircrew member will escort passengers when enplaning or deplaning through the aft door and ramp.

17.5.2.3.3. Auxiliary ground loading ramps may be used.

17.5.2.3.4. Unless cargo size and location dictate otherwise, deplane passengers before cargo, and enplane after cargo.

17.5.3. Personnel Onload and Offload Through the Crew Entrance Door.

17.5.3.1. Station an aircrew member (normally the AMT/Scanner) on interphone with cord held taut at approximately 20 feet at an angle of 45 degrees from the aircraft axis.

17.5.3.2. Brief deplaning personnel to secure loose articles and remain forward of the interphone cord.

17.5.3.3. No enplaning personnel should approach the airplane until the AMT/Scanner is in place.

17.5.4. Taxi. Resume taxi after coordination with the AMT/Scanner.

CAUTION: Ramp should be raised to approximately 12 inches above the horizontal position prior to taxi.

17.6. Combat Checklists. The following checklists and their amplified procedures will be contained in **Chapter 10** of this volume. They will be issued to aircrews in checklist format as part of the Aircrew Inflight Guide. Alteration of these procedures is permissible to comply with ROE, ATO, SPINS, or local requirements.

17.6.1. Combat Entry Checklist. Complete this checklist before entering the threat environment. The checklist includes items to aid in survivability based on specific mission requirements.

17.6.2. On Orbit Checklist. Complete this checklist prior to entering the orbit area or area of increased threat, as appropriate.

17.6.3. Off Orbit Checklist. This checklist is intended to return the aircraft to a configuration appropriate to departure from the orbit area or area of increased threat (i.e., to conduct aerial refueling operations). It is not intended to return the aircraft to a normal configuration, and therefore must be followed up by the Combat Exit Checklist, once clear of the threat environment, if a return to base is planned.

17.6.4. Combat Exit Checklist. Use this checklist to return the aircraft to normal cruise configuration upon departing the threat environment.

Chapter 18

AIRCRAFT FORMATION

18.1. General. Not applicable to this aircraft MDS.

Chapter 19

AIRDROP

19.1. General. Not applicable to this aircraft MDS.

Chapter 20

AEROMEDICAL EVALUATION

20.1. General. Not applicable to this aircraft MDS.

Chapter 21

SEARCH AND RESCUE

21.1. General. The level of participation in Search and Rescue (SAR) operations varies by squadron. In most cases, EC-130 aircraft will continue to perform their mission, either in support of the general operation or in support of the rescue operation. 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. Specific procedures will be outlined in **Chapter 10**, Local Procedures.

Chapter 22

EMERGENCY NUCLEAR AIRLIFT

22.1. General. Not applicable to this aircraft MDS.

Chapter 23

AIRCREW CHEMICAL OPERATIONS AND PROCEDURES

23.1. Wear of the Aircrew Chemical Defense Ensemble (ACDE). Wearing ACDE (includes the aircrew eye respirator protection [AERP] above-the-shoulder system and CWU-66P integrated aircrew chemical coverall [IACC]) will constrain normal aircraft operations. Procedures and equipment have been tested under restricted conditions, and "business as usual" will not be possible. Individual situations will dictate what can and cannot be done. To properly adapt, aircrews must understand hazards involved and the limitations of their chemical defense equipment.

23.1.1. This chapter is intended to enhance other aircrew chemical defense training and provide the aircrew member a basic understanding of utilizing ACDE in a chemical-biological threat area (CBTA). It combines information from technical orders and unit inputs to form a single source document.

23.1.2. This chapter briefly describes the nature of the chemical threat and agents that may be faced. Secondly, it discusses some of the situations and problems the aircrew may encounter in a chemical threat environment. Preparatory actions and countermeasures are examined so the aircrew member can make optimal use of the ACDE and fly the mission safely. While the information presented may need to be modified, the specific objectives of this chapter will help prepare the aircrew member for the unique challenges imposed by chemical weapons.

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

23.2.1. 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.

23.2.2. 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.

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

23.2.4. 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.

23.2.5. 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.

23.3. 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.

23.4. Nerve Agents:

23.4.1. 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.

23.4.2. 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.

23.4.3. 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.

23.4.4. 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.

23.4.5. 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.

23.5. Blister Agents:

23.5.1. 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.

23.5.2. 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.

23.5.3. 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.

23.5.4. 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.

23.6. Choking Agents:

23.6.1. 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.

23.6.2. 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.

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

23.6.4. 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.

23.7. Blood Agents:

23.7.1. 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).

23.7.2. 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.

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

23.7.4. 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 life support personnel (AFSC 1T1X1).

23.8. Aircrew Operations. Performance of duties while wearing the ACDE can be extremely physically and mentally demanding. Special preparation and crew coordination are required to operate under chemical conditions. The information presented here will enable the aircrew to successfully operate in a chemical environment by recognizing limits and exploiting the capabilities of the chemical defensive equipment. Consider the following factors:

23.8.1. Non-flying Ground Operations. Ground operations can represent the highest threat to aircrew safety. Protection from enemy attacks and exposure to liquid chemical agents is paramount. Aircrews should be advised to limit activities to essential duties only, and to separate ground duties from air duties. The ground ensemble is designed for quick donning and heavier levels of concentrations that can be more evident during ground operations. The aircrew ensemble is designed for light concentration levels that could be found during flying operations and transiting to and from the aircraft. Also, ACDE requires care during donning using "buddy dressing" procedures and life support expertise during aircrew contamination control area (ACCA) processing.

23.8.2. Equipment Limitations. Due to thermal stress and the degraded performance associated with wearing of the ACDE, it is highly desirable to minimize the time and number of personnel exposed to chemical agents. Aircrew members must be familiar with the limitations of the ACDE and

properly plan their duties. ACDE is designed to protect against vapor agents only and the mask and hood assembly can not be donned quickly in time of attack.

23.8.3. 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.

23.8.4. 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 val-salva 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.

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

23.8.6. 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.

23.8.7. Peripheral Visions Limits. The aircrew chemical defense mask may reduce peripheral vision as much as 15 percent.

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

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

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

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

23.9. 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.

23.9.1. Fuel Requirements. Extra fuel may have to be carried to compensate for altitude restrictions as the result of chemical agent exposure. If the aircraft has contamination, follow procedures outlined in paragraph **23.16.** If purging procedures are used, the aircraft will be unpressurized, and, although

the aircrew can use the aircraft oxygen systems, passengers wearing the ground chemical defense ensemble (GCDE) cannot. This restricts the aircraft cruise altitude and increases fuel requirements.

23.9.2. Oxygen Requirements. Operating into a CBTA will increase oxygen requirements. The aircrew may be required to rely on the ACDE mask and aircraft oxygen system to counter actual and suspected chemical 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.

23.10. ACDE Issue and Medical Pretreatment. Aircrews will be issued sized ACDE and GCDE at home station. Aircrews will ensure their ACDE and GCDE are available at all times while in a CBTA. During deployments, the unit commander or applicable C2 agency will issue at least one ACDE and one GCDE to each aircrew member as directed. Life support technicians will prepare and issue mobility ACDE "D" bags for aircrew members (AFI 11-301, Chapters 5 and 7). 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.

23.11. In a Chemical-Biological Threat Area (CBTA):

23.11.1. Establishing Threat Level. Aircrews should monitor C2 channels to ensure they receive the latest information concerning the destination's alarm condition. Diversion of aircraft to alternate "clean" locations may be required, unless operational necessity dictates otherwise.

23.11.2. Protective Equipment Postures. The following uses U.S. forces alert signals to outline ACDE/GCDE procedures for flying personnel:

23.11.2.1. "ALL CLEAR." Attack is not probable. **Notification**--verbal; removal of warning signs and flags. **ACDE Requirements**--equipment is issued, prepared for flying, and kept readily available. **GCDE Requirements**--equipment is issued and readily available.

23.11.2.2. "ALARM YELLOW." Attack is probable. **Notification**--verbal; posting of yellow warning signs and flags. **ACDE Requirements**--if en route to fly or during flying operations, all components will be worn except mask and hood, gloves, over-cape, and over-boots. Mask and hood will be immediately available. **GCDE Requirements**--appropriate components should be worn with the mask and hood and immediately available commensurate with ground duties.

23.11.2.3. "ALARM RED." Attack is imminent or in progress. **Notification**--verbal; posting of red warning signs and flags; 1- minute warbling tone from sirens; succession of long blasts (3 seconds on--1 second off) from warning devices. **ACDE Requirements**--full ACDE will be worn for flying duties. **GCDE Requirements**--full GCDE should be worn commensurate with ground duties.

23.11.2.4. "ALARM BLACK." Contamination is suspected or present. **Notification**--verbal; posting of black warning signs and flags; broken warbling tone from sirens; succession of short blasts (1 second on--1 second off) from warning devices. **ACDE Requirements**--full ACDE will be worn. **GCDE Requirements**--full GCDE will be worn commensurate with ground duties.

23.12. Donning Equipment. Aircrew will don ACDE based on the alarm condition. Use the "buddy dressing" procedures and refer to the appropriate Aircrew Chemical Defense Ensemble Size Card, or

AFMAN 10-100, *Airman's Manual*, to ensure proper wear. When wearing the ACDE, Atropine and 2 PAM Chloride auto injectors will be kept in the upper left flight suit pocket. This standardized location will allow personnel to locate the medication should nerve agent poisoning overcome an individual. 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 whenever entering a CBTA with a declared alarm condition of "yellow" or higher. When inbound to CBTA, prior to descent, the AC will ensure crew and passengers don appropriate protective equipment according to arrival destination's mission oriented protective posture (MOPP) level and brief aircrew operations in the CBTA. As a minimum, this briefing will include:

23.12.1. Flight deck/Mission section isolation

23.12.2. Oxygen requirements

23.12.3. Air conditioning system requirements

23.12.4. CW clothing requirements

23.12.5. Ground operations and MOPP levels

23.13. Ground Operations:

23.13.1. Off and On Considerations. Extreme care must be exercised to prevent contamination of aircraft interiors during ground operations, particularly to the flight deck and mission areas. 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. Unloaded cargo will be protected prior to and while being transported to the aircraft. Protective covers will be removed just prior to placing the cargo on the aircraft. It is the user's responsibility to determine and decontaminate equipment in his or her charge. Aircrew members entering the aircraft will remove plastic over-boots and over-cape portions of the aircrew ACDE and ensure flight and mobility bags are free of contaminates and placed in clean plastic bags. Aircrew exiting aircraft into a chemical contaminated environment will don plastic over-boots and over-cape prior to leaving the aircraft.

23.13.2. Physiological Factors. ACs must be very sensitive to the problems resulting from physical exertion while wearing ACDE. The AC should consider factors such as ground time, temperature, and remaining mission requirements when determining on-load and off-load requirements. Individuals involved should be closely monitored for adverse physiological effects.

23.13.3. Communications. Conducting pre-mission operations while wearing the complete ACDE complicates communications capability. Use the mini-amplifier or speaker, aircraft public address systems, or aircraft interphone system. Augment with flashlight and hand signals as required.

23.13.4. Passengers. A path should be decontaminated between the aircraft and the ground transportation vehicle to reduce interior decontamination when loading and unloading passengers.

23.14. Chemical Attack During Ground Operations. If an attack (ALARM RED) occurs during pre-mission operations or transport to and from aircraft, take immediate cover away from the aircraft or vehicle. Follow "buddy dressing" procedures to ensure proper donning of ACDE prior to flight.

NOTE: Aircrews should don the ground crew protective chemical mask and protective helmet, consistent with circumstances and duties. Aircrews could be expected to forward information concerning medical aid, damage estimates, unexploded ordinance. Appropriate information may be sent via aircraft radios to the controlling agencies.

23.15. Crew Rest Procedures. Operational necessity may require the aircrew to rest or fly in a contaminated CBTA. If another aircrew is not staging the mission or preflight crews are not available, the aircrew will normally preflight, load, and secure the aircraft prior to entering crew rest. The departing aircrew will perform necessary crew preparations, and preflight briefings then report to the ACCA for processing with assistance from life support personnel who will assist aircrews donning ACDE prior to reassuming flying duties. If possible, aircrew transport should be provided in covered vehicle. Aircrews should avoid preflighting aircraft prior to departure to prevent contamination to themselves and 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.

23.16. Outbound with Actual or Suspected Chemical Contamination--Venting Aircraft and Removing ACDE Components. With actual or suspected vapor contamination, the aircraft must be purged for two hours using Smoke and Fume Elimination procedures to eliminate the vapor hazard. To ensure no liquid contamination exists, a close inspection of aircrew, passengers, flight deck, passenger compartment, and cargo compartment/Capsule will be conducted using M-8 and M-9 detection paper. Currently, vapors may be detected using the M-256 kit. Aircrews and passengers may remove their respective ensemble components if vapors have been purged and liquid agents are not detected on the flight deck or in the passenger compartment. If liquid contamination is present, the aircrew must take every precaution to prevent spreading them throughout the aircraft, especially on the flight deck. The best course is to identify actual or suspected contamination and physically avoid those areas for the remainder of the flight. Aircrews should attempt to maintain a total separation between the cargo compartment and the flight deck if the cargo area has liquid contamination. The environmental curtain should be fully installed and the cargo compartment kept as cool as possible (liquid agents are less volatile at lower temperatures). Personnel who have been contaminated with liquid agents will remain in their respective ensemble until processed through the applicable CCA.

23.17. Communicating Down-Line Support. Pass chemical contamination information through C2 channels when inbound. This information will be used to determine if a diversion flight is required. Report the physical condition of any crew or passengers who are showing chemical agent symptoms and whether they are wearing chemical defense ensembles.

23.18. After Landing Decontamination Procedures. Aircraft returning from CBTA bases will be decontaminated at an island base or CONUS off-load station. Advise recovery base command post of suspected or actual chemical contamination. Decontamination will be done by the most expedient method. Aircrews will proceed to the ACCA for processing. Ground personnel will report to GCCA for processing. All personnel will remove protective clothing according to established procedures located in respective CCA.

NOTE: Because of the technical characteristics of life support and flying equipment and mission essential aircrew resources, an ACCA is required to ensure minimum exposure to contaminants. GCCAs are generally used to process ground crew personnel and typically are subject to potentially higher concentration levels. The ACCA is equipped and manned by trained life support personnel to process aircrews and decontaminate their equipment.

23.19. 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 inflight and ground duties. **Table 23.1.** lists degradation factors for wearing a full ground chemical ensemble, and may also be

used to represent the task time multipliers for the ACDE. To estimate how much time it takes to perform a task or operation; (1) take the task time multiplier for the appropriate work rate and ambient air temperature, and (2) multiply it by the time it normally takes to perform the task. For example, given a heavy work rate and an air temperature of 70F, the aircrew member should expect a normal 1 hour task to take 2.1 hours while wearing ACDE.

Table 23.1. 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

Chapter 24

CONFIGURATIONS

Section 24A—Policy

24.1. General. This chapter establishes standard equipment and location of such equipment aboard the EC-130E/H and BAI assigned C-130 aircraft. Tables in this chapter provide itemized information to compute weight and balance. Refer to TO 1EC-130H(CC)-9 for additional information regarding Compass Call (Block 30) aircraft.

NOTE: This chapter serves as Addenda A for EC-130E/H aircraft.

24.2. Weight and Balance. Configuration equipment and necessary supply changes to conduct missions affect the weight and balance of the aircraft. To standardize equipment and the location of the equipment, items shown in **Table 24.1.** and **Table 24.2.** will be included in the basic weight of the aircraft and remain on the aircraft except for maintenance and inspection. Equipment listed in **Table 24.3.** and **Table 24.4.** will be added as necessary and entered in references 5, 6, or 7 of DD Form 365-4. For simplicity, the person completing the DD Form 365-4 will enter the weight contained in the required equipment table for the applicable configuration. Adjustments will be made when the actual on board weight of these items vary from the data shown. DD Form 365-4 will be completed IAW instructions in **Section 24E**.

24.3. Contingency/Deployment Configuration. During aircraft contingency and/or deployment generations, it is imperative aircraft deploy with the full minimum complement of life support equipment listed in **Table 24.1.** and **Table 24.2.** This equipment must be at forward operating locations to allow maximum mission flexibility when aircraft are away from home station.

24.3.1. Quick Reaction Capabilities (QRC). Due to emerging technology and the needs of specific missions, Compass Call aircraft may have additional mission equipment known as “clip-ins” or “QRCs” installed on the aircraft. When clip-in equipment is installed, the weight of each component and its location on the aircraft will be annotated in the AFTO Form 781A. The flight engineer is responsible for verifying locations and completing the Form F based on the equipment installed.

Table 24.1. Compass Call Deployment/Contingency Equipment.

Item	Qty
Oxygen Mask, Scott 358/Goggles	4
Firefighter's Smoke Mask	2
Emergency Escape Breathing Device (EEBD)	3
Restraint Harness, PCU-17P with safety Strap HBU-6/P	2
Parachute, Back Automatic Style, BA - 22/BA-18	15
Survival Kit, ML-4	15
Life raft, 20 -person	2
Life Preserver, LPU-10/P or LPU-2/P	15
Exposure Suit, CWU-16/P	15

Table 24.2. ABCCC Deployment/Contingency Equipment.

Item	Qty
Oxygen Mask, Scott 358/Goggles	4
Firefighter's Smoke Mask	5
Emergency Escape Breathing Device (EEBD)	3
Restraint Harness, PCU-17P with safety Strap HBU-6/P	2
Parachute, Back Automatic Style, BA-22/BA-18	22
Survival Kit, ML-4	22
Life raft, 20 -person	2
Life Preserver, LPU-10/P or LPU-2/P	22
Exposure Suit, CWU-16/P	22

Section 24B—Consolidated Equipment Tables

24.4. General. Configure assigned aircraft with the equipment in **Table 24.3.** and **Table 24.4.**, as specified. Include this equipment in the aircraft basic weight. Items listed in **Table 24.5.** and **Table 24.6.** are added, as necessary, to attain a specific configuration and/or comply with mission directives.

Table 24.3. Compass Call Standard Equipment.

	Equipment	Quantity	Location
1	AC generator pad	1	Stowed in bin in cargo door.
2	Air conditioning plugs	2	Stowed in bin in cargo door.
3	ATM air intake plug	1	Stowed in bin in cargo door.
4	Avfuels identiplate	1	Stowed in single point refueling compartment.
5	Axe, hand emergency	4	As prescribed by applicable flight manual.
6	Belt, seat safety	1 set	Installed/stowed with each seat aboard the aircraft.
7	Black out curtains	4	One in each pocket in sound proofing near the windows.
8	Containers, liquid (2 gal)	2	Stowed in galley. (Note 2)
9	Cords, Inter-phone (15 ft)	A/R	1 Cord at each interphone panel.
10	Cords, Scanner (75 ft)	2	75 ft at inter-phone panel FS 245, 50 ft in canvas bag aft of left paratroop door.
11	Crew rest facilities, bunks with mattresses	4	As prescribed by the applicable flight manual.
12	Curtains, Antiglare	3	As prescribed by applicable flight manual.
13	Chains, tiedown 10,000 lb	14	Stowed in bins aft of left or right paratroop doors. (Notes 1 and 3)

	Equipment	Quantity	Location
14	Cup, food warmer	2	Located in galley.
15	Device, tiedown 10,000 lb	7	Stowed in bracket FS 790 left side. (Note 1)
16	Engine intake & exhaust plugs	4/4	Stowed in bin in cargo door.
17	*Emergency Escape Breathing Device (EEBD)	3	Stowed on lower flight deck crew bunk.
18	Extinguisher, fire	5	As prescribed by applicable flight manual.
19	*Firefighter's smoke mask	2	Attached to portable oxygen harness.
20	Fluid, hydraulic	21 quarts	Stowed in cargo net box on left side of cargo ramp. Stowed in cargo door on A/C 0989.
21	Fuel tank dipstick	1	Stowed in bin in ramp.
22	Fuel tank drain tube	1	Stowed in bin in cargo door.
23	Ground wires	2	1 below G-file, 1 Stowed in bin right side FS 743.
24	Gun box	1	Aft of right paratroop door.
25	Hand crank, landing gear	2	FS 495 left and right side.
26	Jack and tow fitting	2	Stowed in container immediately aft of right paratroop door.
27	Jack pads	1 set	Stowed on bulkhead at FS 245 right side.
28	Kit, First aid aeronautical	12	As prescribed by applicable flight manual.
29	Ladder, Maintenance	1	Stowed on Fwd side of right side equipment rack. (stowed on ramp of block 30 A/C)
30	Lamp, ALDIS w/lens kit	1	Stowed in box on navigator's table.
31	Latrine curtains	2	Stowed in cargo door left side stowage bins.
32	*Life rafts	2	In inboard wing well compartments.
33	Life support storage bins	1\2	Stowed on ramp. (some block 30 A/C require two bins)
34	Light, emergency exit	6	Adjacent to each emergency exit as prescribed by applicable flight manual.
35	Lock assy, main landing gear	2	Misc. stowage box, R/H side aft of troop door.
36	Locking kit, ground security	1	Stowed aft of right troop door.
37	Main landing gear tiedown device	2	Stowed in bin in cargo door.
38	Microphone, handheld	3	One left side pilot seat, one right side copilots seat. One left bulkhead, FS 245.
39	Nav publications	A/R	Below navigators table.
40	Nose gear pin	1	Aft of pilots seat (inflight).
41	Oil, engine	21 quarts	Stowed in cargo net box on right side of cargo ramp. Stowed in cargo door on A/C 0989.

	Equipment	Quantity	Location
42	Oven	1	Located in galley.
43	Oxygen bottle, walkaround (A-6)	6	As prescribed by applicable flight manual.
44	Pitot covers	2	Stowed in bin in cargo door.
45	*Quick Don (oxygen mask) w/goggles (Scott 358 series)	4	P, CP, N, FE
46	Rack, parachutes	1	Stowed right side FS 580. (block 20 only)
47	Restraint harness, PCU-17/P, with safety strap, HBU-6/P	2	One attached to the inboard seat belt mount of the flight deck lower bunk and one stowed in the aft mission compartment.
48	Rope, emergency escape	2	One installed aft of each overhead exit in accordance with the applicable flight manual.
49	Sextant	1	Stowed in rack on forward side bulkhead FS 245.
50	Starter pad	1	Stowed in bin in cargo door.
51	Straps, tiedown 5,000 lb	20	Stowed in lower bins in cargo door.
52	Sun visors	2	Stowed above pilots/copilots side windows.
53	Trash container	2	1 forward of navigators table, 1 as required in mission compartment.
54	Technical publications (G-files)	1 set	Stowed in cabinet at crew entrance door.
55	Wheel chocks	4	Secured as required when not in use.
56	Wrench, main landing gear, emergency extension	1	FS 470, left side. Stowed at FS 470 right side block 30 A/C.

Notes:

1. Individual units may determine the number of straps, chains, and devices to be carried on local training missions; however, there will always be enough tie-down equipment for the restraint of loose equipment and emergency landing gear tie-down (for aircraft not configured with Main Landing Gear Tie-down Devices).

2. Water required for all flights. See **Table 13.1.**

3. String or wire will be connected diagonally across the top of each chain box (below lid). Hang tie-down chain hooks from the string/wire to allow chains to be inventoried without removing them from the boxes.

*****These items indicate configuration IAW AFI 11-301. Store life support items separately from grease, oil, hydraulic fluid, etc.

Table 24.4. ABCCC Standard Equipment.

Item	Equipment	Quantity	Location
1	Air conditioning plugs	2	Stowed in bin in cargo door
2	ATM air intake plug	1	Stowed in bin in cargo door
3	Avfuels identification plate	1	Stowed in single point refueling compartment
4	Axe, hand emergency	2/(3)	As prescribed by applicable flight manual
5	Belt, seat safety	1 set	Installed/stowed with each seat aboard the aircraft
6	Black out curtains	4	One in each pocket in sound proofing near the windows
7	Containers, liquid (2gal)	2/(4)	Stowed in galley (Note 2)
8	Cords, Inter-phone (10ft)	A/R	1 Cord at each interphone panel
9	Cords, scanner (75ft)&(50ft)	2	75 ft at inter-phone panel FS 245, 50 ft in canvas bag aft of left paratroop door
10	Crew rest facilities, bunks with mattresses	2	As prescribed by applicable flight manual
11	Curtains, antiglare	3	As prescribed by applicable flight manual
12	Chains, tiedown 10,000 lb	14	Stowed in bins aft of left or right paratroop doors (Notes 1 and 3)
13	Cup, food warmer	2/(2)	Located in galleys
14	Device, tiedown 10,000 lb	6	Stowed aft of FS 245 (Note 1)
15	Engine intake & exhaust plugs	4&4	Stowed in bin in cargo door
16	*Emergency escape breathing device (EEBD)	3	Under flight deck lower bunk
17	Extinguisher, fire	4/(4)	As prescribed by applicable flight manual
18	*Firefighter's smoke mask	2/(3)	Attached to portable oxygen harness
19	Fluid, hydraulic	21 quarts	Stowed in bin in cargo door
20	Fuel tank dip stick	1	Stowed in cargo compartment
21	Fuel tank drain tube	1	Stowed in bin in cargo door
22	Ground wires	2	Below pubs cabinet (G-files)
23	Hand crank, landing gear	2	FS 495 left and right side
24	Jack and tow fitting	2	Stowed in container immediately aft of right paratroop door
25	Jack pads	1 set	Stowed on bulkhead at FS 245 right side
26	Kit, first aid aeronautical	8/(4)	As prescribed by applicable flight manual
27	Ladder, maintenance	1	Stowed at FS 650 (Stowed at FS 680 with the AN/USC-48 installed)

Item	Equipment	Quantity	Location
28	Lamp, ALDIS w/lens kit	1	Stowed in box on navigator's table
29	Latrine curtains	1	Stowed in cargo door left side stowage bins
30	*Life rafts	2	In inboard wing well compartments
31	Light, emergency exit	7/(5)	Adjacent to each emergency exit as prescribed by applicable flight manual
32	Lock assy, main landing gear	2	Misc. stowage box, R/H side aft of troop door
33	Locking kit, ground security	1	Stowed fwd of left and right paratroop door
34	Main landing gear tiedown device	4	Stowed in FS 650. (slick aircraft only)
35	Microphone, handheld	3	One left side pilot seat, one right side copilots seat, one left bulkhead, FS 245
36	Nav publications	A/R	Below navigators table
37	Nose gear pin	1	Aft of pilots seat (inflight)
38	Oil, engine	21 quarts	Stowed in bin in cargo door
39	Oven	1/(1)	Located in galleys
40	Oxygen bottle, walkaround (A-6)	4/(8)	As prescribed by applicable flight manual
41	Pitot covers	2	Stowed in bin in cargo door
42	*Quick don (oxygen mask) w/goggles (Scott 358 series)	4	P, CP, N, FE
43	Restraint harness, PCU-17/P, with safety strap, HBU-6/P	2	One attached to the inboard seat belt mount of the flight deck lower bunk and one stowed in the aft mission compartment
44	Rope, emergency escape	3	One installed aft of each overhead exit in accordance with the applicable flight manual
45	Sextant	1	Stowed in rack on forward side bulkhead FS 245
46	Straps, tiedown 5,000 lb	10	Stowed in lower bins in cargo door
47	Sun visors	2	Stowed above pilots/copilots side windows
48	Trash container	1	Forward of navigators table
49	Technical publications (G-files)	1 set	Stowed in cabinet at crew entrance door
50	Wheel chocks	4	Secured as required when not in use

Item	Equipment	Quantity	Location
51	Wrench, main landing gear, emergency extension	1	FS 470, left side

Notes:

1. Individual units may determine the number of straps, chains, and devices to be carried on local training missions; however, there will always be enough tie-down equipment for the restraint of loose equipment and emergency landing gear tie-down (for aircraft not configured with Main Landing Gear Tie-down Devices).

2. Water is required for all flights. See **Table 13.1.**

3. String or wire will be connected diagonally across the top of each chain box (below lid). Hang tie-down chain hooks from the string/wire to allow chains to be inventoried without removing them from the boxes.

*Parenthesis items ( ) indicate additional items carried when the AN/USC-48 capsule is installed.

*These items indicate configuration IAW AFI 11-301. Store life support items separately from grease, oil, hydraulic fluid, etc.

Table 24.5. Compass Call Mission Equipment.

Item	Equipment	Quantity	Location
1	*Anti-exposure suit	15	Stowed in life support box on the ramp.
2	*Emergency Escape Breathing Device (EEBD)	3	Stowed on the right side of the forward lower crew bunk.
3	*Life preserver unit LPU - 10/P-2/P	20	Stowed in life support box on the ramp.
4	Rations (MRE/LRPS, case)	2	As required
5	*Parachutes	Note 3	Stowed in life support box on the ramp.
6	*Seat Kits ML-4	15	Stowed in life support box on the ramp.
7	*Survival Vests	15	Stowed in life support box on ramp.
8	Tool Box, Maintenance	1	As required.
9	Tool Kit, FEís	1	As required.
10	Water container (Igloo)	A/R	Stowed as loose equipment.

Notes:

1. The aircraft will not fly over water unless an approved flotation device is aboard the aircraft for each person and the device is within reach of seated occupant.

2. Equipment not listed, but required by an individual unit, will normally be stowed in an appropriate non-interference area.

3. Total number of parachutes required on EC-130H airplanes is one per aircrew member, plus 10%.

*These items indicate configuration IAW AFI 11-301. Store life support items separately from grease, oil, hydraulic fluid, etc.

Table 24.6. ABCCC Mission Equipment.

Item	Equipment	Quantity	Location
1	*Anti-exposure suit	22	4ea. stowed on R/H side of capsule at FS. 429, 3ea. stowed on R/H side of capsule at FS. 655, 1ea stowed at each crew position in capsule (15)
2	*Emergency Escape Breathing Device (EEBD)	3	Stowed on the right side of the forward lower crew bunk.
3	*Life preserver unit LPU-10/P-2/P	22	4ea stowed on flight deck bunk, 3ea stowed on R/H side of capsule at FS. 655, 1ea stowed at each crew position in capsule (15)
4	Rations (MRE/LRPS, case)	3	As required
5	*Parachutes	Note 3	4ea hung on rack at FS. 350-400 on L/H side of capsule, 3ea stowed on R/H side of capsule at FS. 655, 1ea stowed at each crew position in the capsule (15)
6	*Seat Kits ML-4	22	4ea stowed on R/H side of capsule at FS. 429, 3ea stowed on R/H side of capsule at FS. 655, 1ea stowed at each crew position in capsule (15)
7	*Survival Vests	22	4ea stowed on R/H side of capsule at FS. 429, 7ea stowed on R/H side of capsule at FS. 655, 11ea stowed at FS.720 behind R/H capsule door
8	Tool Box, Maintenance	1	As required
9	Tool Kit, FEís	1	As required

Notes:

1. The aircraft will not fly over water unless an approved flotation device is aboard the aircraft for each person and the device is within reach of seated occupant.

2. Equipment not listed, but required by an individual unit, will normally be stowed in an appropriate non-interference area.

3. Total number of parachutes required on EC-130E airplanes is one per aircrew member, plus 10%.

*These items indicate configuration IAW AFI 11-301. Store life support items separately from grease, oil, hydraulic fluid, etc.

Section 24C— Required Equipment Weight and Balance Data

24.5. General. This section contains basic aircraft weight, location, and moment data for associated required equipment. Since individual unit deviations (more or less equipment) may occur, units will publish a unit supplemental listing standard configuration chart depicting weight and moment totals for the DD Form 365-4, references 5, 6 and 7. Charts may be maintained in the weight and balance handbook on each aircraft. Use **Table 24.9.**, **Table 24.10.**, and **Table 24.11.** for computing the DD Form 365-4 for both Compass Call Block variants and ABCCC aircraft.

24.6. Configuration. Although modifications to the basic configurations are authorized to meet special requirements, the following factors should be considered.

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

24.6.2. 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.

24.6.3. 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 1C-130A-9 and/or TO 1EC-130H(CC)-9 for other restrictions.

24.6.4. Over water flights are limited to a maximum of 40 personnel on the aircraft unless additional wing life rafts are installed.

Section 24D—Reference Data

24.7. General. This section contains reference data to assist personnel in load planning.

24.8. Miscellaneous Data. The following **Table 24.7.** and **Table 24.8.** are provided to aid in configuration planning, and weight and balance:

Table 24.7. Compass Call Standard Weights.

Personnel	Weight/Lbs.
Aircrew member (with professional gear)	200
Passenger (without baggage)	175
Equipment Weights	**Weight/Lbs.**
Anti-exposure suit	6
Baggage (ea.)	66
Emergency escape breathing device (EEBD)	6
Emergency equipment box (plastic)	130
Emergency equipment box (metal)	285
Feed Boom	80
Hot Cup	3
Life Preserver, LPU-10/P or LPU-2/P	4
Life raft (20-person)	180
Liquid container w/contents	25
Liquid container w/o contents	9
Oxygen bottle, portable	6
Parachutes	32
Personnel restraint harness, PCU 17/P with safety strap HBU-6/P	10
Safe	90
Smoke mask	1
Spare Fluids oil/hydraulic (1case ea.)	84
Survival kit, ML-4	22.5
Survival vest	9.5
Tiedown, Chain, MB-1/GCU-4/E	7
Tiedown, device, MB-1/GCU-4/E	3.5
Tiedown, strap, GCU-1/B	4
Tool Box, Maintenance	95
Water, container (2-gal, Igloo w/contents)	25
Water, drinking, per gallon	8

Table 24.8. ABCCC Standard Weights.

Personnel	Weight/Lbs.
Aircrew member (with professional gear)	200
Passenger (without baggage)	175
Equipment Weights	**Weight/Lbs.**
Baggage (ea.)	66
Emergency escape breathing device (EEBD)	6
Hot cup	3
Spare fluids oil/hydraulic (1 case ea.)	84
Life raft (20-person)	180
Liquid container w/contents	25
Liquid container w/o contents	9
Oxygen bottle, portable	6
Tool box, maintenance	125
Smoke mask	1
Tiedown, chain, MB-1/GCU-4/E	7
Tiedown, device, MB-1/GCU-4/E	3.5
Tiedown, strap, GCU-1/B	4
Parachutes	32
Survival kit, ML-4	22.5
Survival vest	9.5
Life preserver, LPU-10/P or LPU-2/P	4
Anti-exposure suit	6
Personnel restraint harness, PCU-17/P with safety strap HBU-6/P	10
Monitor and software (MPS, Boxed)	207
Optical disk (MPS, Boxed)	58
CPU (MPS, Boxed)	91
Printer (MPS, Boxed)	91
MLG tie down device	27

Table 24.9. Crew Weight and Moment Table (Block 20).

NUMBER OF CREW	LOCATION	WEIGHT	MOMENT/1000
4	3B-1H	800	205
5	4B-1H	1000	239
6	5B-1H	1200	273
7	5B-1D-1H	1400	333
8	5B-2D-1H	1600	393
9	5B-2D-1E-1H	1800	467
10	5B-2D-2E-1H	2000	541
11	5B-3D-2E-1H	2200	601
12	4B-4D-2E-1F-1H	2400	709
13	4B-4D-3E-1F-1H	2600	783
14	4B-4D-3E-2F-1H	2800	865
15	5B-4D-3E-2F-1H	3000	899
16	6B-4D-3E-2F-1H	3200	933
17	6B-4D-3E-2F-1H-1L	3400	1093
18	6B-4D-3E-2F-1H-2L	3600	1253
19	6B-4D-3E-2F-1H-2L-1M	3800	1491

Table 24.10. Crew Weight and Moment Table (Block 30).

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

Table 24.11. Crew Weight and Moment Table (ABCCC).

NUMBER OF CREW	LOCATION	WEIGHT	MOMENT/1000
4	3B-1E	800	164
5	4B-1E	1000	205
6	4B-2E	1200	280
7	4B-2E-1F	1400	366
8	4B-2E-1F-1G	1600	459
9	4B-2E-1F-2G	1800	557
10	4B-2E-1F-2G-1H	2000	661
11	4B-2E-1F-2G-2H	2200	772
12	4B-2E-1F-2G-3H	2400	889
13	4B-2E-1F-2G-3H-1I	2600	1012
14	4B-2E-1F-2G-3H-1I-1J	2800	1141
15	4B-2E-1F-2G-3H-1I-2J	3000	1278
16	4B-2E-1F-2G-3H-1I-2J-1K	3200	1416
17	4B-2E-1F-2G-3H-1I-2J-1K-1H	3400	1535
18	4B-2E-1F-2G-3H-1I-2J-1K-2H	3600	1643
19	4B-2E-1F-2G-3H-1I-2J-1K-2H-1F	3800	1733
20	4B-2E-1F-2G-3H-1I-2J-1K-2H-1F-1B	4000	1772
21	4B-2E-1F-2G-3H-1I-2J-1K-2H-1F-2B	4200	1811
22	4B-2E-1F-2G-3H-1I-2J-1K-2H-1F-3B	4400	1850
Note: Table 24.11. reflects aircrew members in capsule as being seated starting from front to rear on right side and continuing from rear to front on the left side.			

Section 24E—DD Form 365-4 Instructions and Miscellaneous Information

24.9. 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.

24.10. 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 1C-130X-5, 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.

24.11. General Instructions. These instructions apply to Forms F using simplified moments. Entries on the form (Figure 24.10) may be either typed, handwritten, or computer entered.

24.11.1. 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.

24.11.2. 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 1C-130X-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.

24.11.2.1. Takeoff. Unless other restrictions are imposed, use 155,000 pounds for EC-130E/H aircraft.

24.11.2.2. Landing. Unless other landing restrictions are imposed, use 155,000 pounds for EC-130E/H and subtract operating weight plus estimated landing fuel (references 9 and 23).

24.11.3. Permissible CG Takeoff and Landing. Compute the forward and aft center of gravity limitations using the center of gravity table in the appropriate TO 1C-130X-5. Leave blank the block entitled Permissible CG Zero Fuel Wt.

24.11.4. Signature Blocks:

24.11.4.1. Computed By --Signature, rank, and organization.

24.11.4.2. Weight and Balance Authority --Leave blank

24.11.4.3. Pilot --Signature on original and duplicate.

24.12. Instructions for Moment Form F. Use applicable TO 1C-130X-5, Chart E.

24.12.1. Reference 1. Enter basic weight and moment from the last entry of the certified copy of DD Form 365-3 (Chart C) in the aircraft weight and balance handbook.

24.12.2. Reference 2. Leave blank.

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

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

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

24.12.6. Reference 8. Leave blank.

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

24.12.8. Reference 10. Enter total takeoff fuel and determine moments from fuel moment charts.

NOTE: In the remarks section, enter a breakdown of takeoff fuel weight to the nearest 100 pounds and moments using the fuel moment charts contained in the applicable TO 1C-130X-5. An alternate method of computing fuel moments is accomplished by multiplying the total fuel by .552. In this instance only the total fuel weight and moment need to be shown for takeoff and landing.

24.12.9. Reference 11. Leave blank.

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

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

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

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

24.12.11.3. 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.

24.12.12. 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.

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

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

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

24.12.16. 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.

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

24.12.18. 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.

24.12.19. Reference 21. Enter figures from reference 14.

24.12.20. Reference 23. Enter landing fuel weight and moment, obtained by determining estimated amount of fuel remaining in tanks for landing. Moment can be determined by using fuel charts in TO 1C-130E-5, or by multiplying the total fuel on board by .552. Regardless of which method is used to compute moments, fuel distribution by tank will always be entered. **NOTE:** In the remarks section enter a breakdown of landing fuel weight/moment by tank. When flight plan fuel weights are not available, use the following criteria to compute fuel burn off (PPH = pounds per hour.).

24.12.20.1. 4,500 PPH - normal flight at altitude

24.12.20.2. 5,000 PPH - low level

24.12.20.3. 6,000 PPH - first hour of flight (climb-out)

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

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

24.12.23. Remarks Block. A/R.

24.12.24. Load Adjuster Number Block. Leave blank.

Figure 24.1. 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*

DATE *(YYYYMMDD)* 2001/05/06	AIRCRAFT TYPE EC-130H	FROM KDMA	HOME STATION KDMA
MISSION DPME	SERIAL NO. 73-1588	TO KDMA	PILOT Pane, Maj.

REMARKS
Fuel @ 6.7 Density

T.O.			LND		
O	15.8	8617	O	4.0	2191
I	14.6	8104	I	2.0	1117
A	5.6	3123			
TOT	36.0	19844		6.0	3308

REF	ITEM	WEIGHT	INDEX OR MOM/1000
1	BASIC AIRCRAFT *(From Chart C)*	103771	541.5
2			
3	CREW *(No.)* 13	2600	88.0
4	CREW'S BAGGAGE		
5	STEWARD'S EQUIPMENT		
6	EMERGENCY EQUIPMENT	1014	76.6
7	EXTRA EQUIPMENT		
8			
9	OPERATING WEIGHT	107385	755.9
10	TAKEOFF FUEL *(Gal.)*	36000	198.44
11	WATER INJ.		
12	TOTAL AIRCRAFT WEIGHT	143391	954.34

LOAD ADJUSTER NUMBER Math and Chart E

CORRECTION/MOST FWD/MOST AFT

13 DISTRIBUTION OF ALLOWABLE LOAD *(PAYLOAD)*

COMPT OR ARM	ITEM	CHANGES *(+ or -)* WEIGHT	CHANGES *(+ or -)* INDEX OR MOM/1000	PASSENGERS NO.	PASSENGERS WEIGHT	COMPT OR ARM	CARGO	CARGO	COMPT OR ARM
							NO LOAD		
TOTAL WEIGHT REMOVED									
TOTAL WEIGHT ADDED									
NET DIFFERENCE									

14 ZERO FUEL WT 107391
ZERO FUEL WT INDEX OR MOM 55797
ZERO FUEL % M.A.C.

LIMITATIONS			
CONDITION	TAKEOFF	LANDING	1 FUEL
ALLOWABLE GROSS WEIGHT	155000	155000	N/A
TOTAL AIRCRAFT WT. (Ref. 12)	143391		
(Ref. 9) + (Ref. 23)		113391	
OPERATING WT. *(Ref. 9)*			
ALLOWABLE LOAD *(Ref. 13) (use smallest figure)*	11609	41609	
1 Zero Fuel or Limiting Wing Fuel			
PERMISSIBLE C.G. TAKEOFF	FORWARD 22.0	AFT 30.0	
PERMISSIBLE C.G. LANDING	FORWARD 17.5	AFT 29.8	
PERMISSIBLE C.G. ZERO FUEL WT.	FORWARD	AFT	

15		
16	TAKEOFF CONDITION *(Uncorrected)*	143391 / 754.34
17	TAKEOFF C.G. IN % M.A.C. OR IN	24.3
18	CORRECTIONS *(If required)*	
19	TAKEOFF CONDITION *(Corrected)*	
20	TAKEOFF C.G. IN % M.A.C. OR IN	
21	ZERO FUEL WT *(Ref. 14)*	107391 / 755.9
22	LESS AIR DROP LOAD	
23	ESTIMATED LANDING FUEL	6000 / 30.8
24	ESTIMATED LANDING CONDITION	113391 / 785.9
25	ESTIMATED LANDING C.G. IN % M.A.C. OR IN	20.5

COMPUTED BY
SIGNATURE
WEIGHT AND BALANCE AUTHORITY SIGNATURE
PILOT SIGNATURE

DD FORM 365-4, AUG 96 (EG) PREVIOUS EDITION MAY BE USED.

24.13. 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 315, **United States Air Force AvFuels Invoice;** AF Form 457, **USAF Hazard Report;** AF Form 523, **USAF Authorization to Bear Firearms; A**F 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 4031, **Crew Resource Management Assessment Sheet;** AF Form 4064, **C-130 Takeoff and Landing Data Card;** AF Form 4108, **C-130 Fuel Log;** AF Form 4116, **C-130 Flight Plan and Log;** AFTO Form 46, **Prepositioned Life Support Equipment;** AFTO Form 151A, **Individual C-130 Aircraft Usage Log;** AFTO Form 781, **Aerospace Vehicle Flight Data Record;** CF 7507, **General Declaration (Outward/Inward);** 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**.

ROBERT H. FOGLESONG, Lt General, USAF
DCS/Air & Space Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

DODD 1327.5, *Leave and Liberty*, 24 Sep 1985

AFTTP 301V16, *Tactical Employment--EC-130H* (U) (Secret)

AFMAN 10-100, *Airman's Manual*

AFI 10-403, *Deployment Planning*

AFI 10-1101, *Operations Security*

AFDD 1-2, *Air Force Glossary*

AFPD 11-2, *Aircraft Rules and Procedures*

AFI 11-2EC-130E/HV1, *EC-130E/H--Aircrew Training*

AFPD 11-4, *Aviation Service*

AFI 11-202V2, *Aircrew Standardization/Evaluation Program*

AFI 11-202V3, *General Flight Rules*

AFH 11-203V1, *Weather for Aircrews*

AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*

AFI 11-209, *Air Force Participation in Aerial Events*

AFI 11-215, *Flight Manuals Program (FMP)*

AFMAN 11-217, Volumes 1 & 2, *Instrument Flight Procedures*

AFI 11-218, Volumes 1 & 2, *Aircraft Operation and Movement on the Ground*

AFJMAN 11-226, *United States Standard for Terminal Instrument Procedures (TERPS)*

AFI 11-235, *Forward Area Refueling Point (FARP) Operations*

AFI 11-301, *Aircrew Life Support (ALS) Program*

AFI 11-401, *Flight Management*

AFI 11-403, *Aerospace Physiological Training Program*

AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking)*

AFI 21-101, *Maintenance Management of Aircraft*

AFI 23-202, *Buying Petroleum Products and Other Supplies and Services Off-Station*

AFI 23-206, *Cash Sales of Ground Petroleum Products in Oversea Areas*

AFJMAN 24-204, *Preparing Hazardous Materials for Military Air Shipments*

AFI 24-401, *Customs--Europe*

AFI 24-402, *Customs--Pacific*

AFI 24-403, *Customs--Southern*

AFI 31-101, *Air Base Defense*

AFI 31-209, *The Air Force Resource Protection Program*

AFI 31-301, *Air Force Installation Security Program*

AFI 31-501, *Personnel Security Program Management*

AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program*

AFI 33-360V1, *Publications Management Program*

AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*

AFI 36-3003, *Military Leave Program*

AFJI 48-104, *Quarantine Regulations of the Armed Forces*

AFI 48-123, *Medical Examinations and Standards*

AFM 51-40, *Air Navigation* (to be converted to AFPAM 11-216)

AFI 91-202, *The US Air Force Mishap Prevention Program*

AFI 91-204, *Safety Investigations and Reports*

Abbreviations and Acronyms

ACN—Aircraft classification number

ANMPP—Air nautical mile per pound

BSS—Buss Switching System

BSU—Bus Switching Unit

BTU—British thermal unit

CBR—California bearing ratio

CBTA—Chemical-Biological Treat Area

C2—Command and Control Center

Dev—Deviation

DPT—Deployment Planning Team

EEBD—Emergency Escape Breathing Device

ETP—Equal time point

FF—Fuel flow

F/Pd—Fuel for a given period or distance

GNMPP—Ground nautical miles per pound

GS—Ground speed

GW—Gross weight

Hd—Density altitude

Hg—Inches of mercury

Hp or PA—Pressure altitude

HP—Horse power

ICAO—International Civil Aviation Organization

IDCU—Integrated Display Computer Unit

IFF—Identification friend or foe

IOAT—Indicated outside air temperature

KCAS—Calibrated airspeed in knots

KEAS—Equivalent airspeed in knots

KIAS—Indicated airspeed in knots

KTAS—True airspeed in knots

In/lb—Inch pounds

Max—Maximum

Mb—Milibars

MHz—Mega-Hertz

Min—Minutes or minimum

MSL—Mean sea level

NMPP—Nautical miles per pound

MNPS—Minimum Navigation Performance Specification

NTS—Negative torque system

OAT—Outside air temperature

OPT—Operational Planning Team

Pax—Passengers

PCN—Pavement Classification Number

POK—Passenger Oxygen Kit

Psi—Pounds per square inch

Psia—Absolute pressure, pounds per square inch

Psig—Gauge pressure, pounds per square inch

QNH—Altimeter setting

RA—Runway available

RCR—Runway condition reading

R/D—Rate of descent (feet per minute)

RL—Runway length

RSC—Runway surface covering

SAT—Static air temperature

SL—Sea level

SM—Statue miles

SOME—Reciprocal of the square root of density ratio (sigma)

TIT—Turbine inlet temperature

TOF—Take-off factor

TOLD—Take-off and landing data

TOP—Torquemeter oil pressure

TR—Transformer Rectifier

UAB—Underwater Acoustical Locator Beacon

V—Velocity or volume

VFR—Visual flight rules

Vmca—Air minimum control speed

VTO—Take-off speed

Terms

Bird Condition Low—No significant bird activity, which would present a probable hazard to flying operations. List restrictions in local **Chapter 10**.

Bird Condition Moderate—Concentrations of 5 to 15 large birds (waterfowl, raptors, gulls, etc.) or 15 to 30 small birds (terns, swallows, etc.) observable in locations that represent a probable hazard to flying operations. Initial takeoffs and final landings allowed only when departure and arrival routes will avoid bird activity. List local restrictions in **Chapter 10**.

Bird Condition Severe—Bird conditions greater than moderate. List restrictions in local **Chapter 10**.

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 the overhead crossing of a radio aid (NDB, VOR, TACAN) at least once each hour with positive course guidance between such radio aids.

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 (C2)—(DOD) 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)

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.

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 AC 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—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.

Joint Force Air Component Commander (JFACC)—The joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force commander will normally designate a joint force air component commander. The joint force air component commanderís responsibilities will be assigned by the joint force commander (normally these would include, but not be limited to, planning, coordination, allocation, and tasking based on the joint force commanderís apportionment decision). Using the joint force commanderís guidance and authority, and in coordination with other Service component commanders and other assigned or supporting commanders, the joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas. Also called JFACC. (Ref: Joint Publication 1-02)

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.

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.

Most Probable Position (MPP)—An MPP is a position determined with partial reference to a DR position and partial reference to all other fixing aids, weighing each one according to the navigator's judgment and experience.

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.

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.)

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 en route time plus one hour and fuel required for en route 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.

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