BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 11-2C-130, VOLUME 3

14 MARCH 2006

Incorporating Change 1, 5 May 2010

934TH AIRLIFT WING Supplement

1 FEBRUARY 2011

Flying Operations

C-130 OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publication and forms are available on the e-Publishing website at **www.e-publishing.af.mil** for downloading or ordering.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: HQ AMC/A37V
(Maj Richard Galley)

Certified by: HQ USAF/A3O
(Brig Gen William L. Holland)

Pages: 304

Supersedes: AFI11-2C-130V3, 01 April 2000

(934AW)

OPR: 934 OG/OGV

Certified by: 934 OG/CC
(Colonel Ronald A. Wilt)

Pages:6

Supersedes: AFI11-2C-130V3_934AWSUP, 23 September 2008

This instruction implements Air Force Policy Directive (AFPD) 11-2, *Aircraft Rules and Procedures* and references AFI 11-202, Volume 3, *General Flight Rules*, as well as Air Force Tactics Techniques and Procedures (AFTTP) 3-3.25, *Combat Aircraft Fundamentals—C-130.* It establishes policy for the operation of the C-130 aircraft to safely and successfully accomplish worldwide mobility missions. This instruction applies to Air Force Reserve Command (AFRC) and Air National Guard (ANG) units.

Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 37-123, *Management of Records*, and disposed of IAW the *Air Force Records Disposition Schedule* (RDS) located at **https://afrims.amc.af.mil/**. This publication requires the the collection and or maintenance of information protected by the Privacy Act (PA)

of 1947. The authorities to collect and maintain the records prescribed in this publication are Title 10 *United States Code*, Chapter 857 and Executive Order 9397, *Numbering System for Federal Accounts Relating to Individual Persons*, 30 Nov 1943. Forms affected by the PA have an appropriate PA statement. System of records notice F011 AF XO, *Aviation Resource Management System* (ARMS) (December 26, 2002, 67 FR 78777) applies. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

(934AW) This supplement implements and extends the guidance of AFI 11-2C-130, Volume 3, *C-130 Operations Procedures*. This supplement establishes 934 Airlift Wing (AW) policies for the operation of C-130 aircraft to safely and successfully accomplish worldwide mobility missions. 934th Operations Group (OG) Stan Eval (934 OG/OGV), has overall responsibility for administration of this supplement. Send comments and suggested improvements to this supplement on AF Form 847, Recommendation for Change of Publication, through channels to 934 OG/OGV, 760 Military Hwy, Minneapolis, MN 55450, or Email to: **934OG.OGV@us.af.mil.** This publication requires the collection and maintenance of information protected by the Privacy Act of 1974. Ensure that all records created as a result of process prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/gcssaf61a/afrims/afrims**/.

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. Major changes include: revising **Chapter 4**, *Aircraft Operating Restrictions*, to reflect current guidance, updating TACC references to 618 TACC, updating AMC Stan/Eval references to AMC/A3V, updated MEGP references to MEP, added Combat Track II information, added IFM procedures, incorporated FCIF and 847 changes. A margin bar indicates newly revised material.

(934AW) Updates fuel dumping procedures, updates Bird to Wildlife for AF Form 853, updates the combining of the Combat Mission and Combat Planning Guide, and updates the first choice of payment for fuel purchases.

Chapter 1—GENERAL INFORMATION **17**

1.1. General. 17

1.2. Applicability. 17

1.2. (934AW) Applicability. 17

1.3. Key Words Explained. 17

1.4. Deviations and Waivers. 17

1.5. Supplemental Procedures. 18

1.6. Local Supplement Coordination Process. 18

1.7. Requisition and Distribution Procedures. 18

1.8. Improvement Recommendations and Review. 18
1.9. Definitions. 18
1.10. Aircrew Operational Reports. 19

Chapter 2—COMMAND AND CONTROL 20

2.1. General. 20
2.2. Execution Authority. 20
2.2. (934AW) The 934th Supervisor of Flying (SOF) is the direct representative of the 934 OG/CC. 20
2.3. Pilot in Command Responsibility and Authority. 20
2.4. Mission Clearance Decision. 21
2.5. Operational C2 Reporting. 21
2.6. Mission Commander (MC). 24
2.7. Not Used. 24
2.8. C2 Agency Telephone Numbers. 24
Table 2.1. 618 TACC Mission Controller Phone Numbers. 24
2.9. Close Watch Missions. 25
2.10. Law Enforcement Support. 25
2.11. Enroute Maintenance Support. 25

Chapter 3—AIRCREW COMPLEMENT/MANAGEMENT 26

3.1. General. 26
3.2. Aircrew Complement. 26
Table 3.1. Aircrew Complement. 26
3.3. Aircrew Member Qualification. 28
3.4. Pilots. 29
3.5. Navigators. 29
3.6. Flight Engineers and Loadmasters. 29
3.7. Aircrew Management. 29
3.8. Scheduling Restrictions. 31
3.9. Counter-Fatigue Management Program. 31
3.10. Crew Rest/En route Ground Time. 33
3.11. Alerting Procedures. 35
3.12. Stage Management. 36
3.13. Standby Force Duty. 36

3.14. Orientation Flights and Incentive Flights. 37
3.15. Interfly. 38
3.16. Additional Crewmembers (ACM). 38
3.17. MEP. 39
3.18. Mission Mobility Observers (MMO). 39

Chapter 4—AIRCRAFT OPERATING RESTRICTIONS 40

4.1. Objective. 40
4.2. Minimum Equipment List (MEL) Policy. 40
4.3. Waiver Protocol. 41
4.4. Technical Assistance. 41
4.5. MEL Table Definitions/Column Identifiers. 41
4.6. C-130 MEL. 42
Table 4.1. Engines/Auxiliary Power Unit (APU)/Gas turbine Compressor (GTC). 42
Table 4.2. Propellers. 43
Table 4.3. Electrical System. 43
Table 4.4. Anti-Ice/De-Ice System. 44
Table 4.5. Air Conditioning, Pressurization and Bleed Air. 45
Table 4.6. Doors and Ramp Systems. 46
Table 4.7. Hydraulics. 47
Table 4.8. Landing Gear. 47
Table 4.9. Brake/Anti Skid Systems. 47
Table 4.10. Fuel System. 48
Table 4.11. Flight Recorder/Locating Systems. 50
Table 4.12. Fire Protection/Warning Systems. 50
Table 4.13. Flight Instruments. 50
Table 4.14. Navigation Systems. 51
Table 4.15. Aircraft Exterior/Interior Lighting. 52
4.7. Supplements. 53
4.8. Navigation Systems. 53
4.9. Gear Down Flight Operations. 53
4.10. Minimum Equipment for NVG Operations. 53

Chapter 5—OPERATIONAL PROCEDURES 55

5.1. Checklists. 55

	5.2.	Duty Station.	55
	5.3.	Flight Station Entry.	55
	5.4.	Takeoff and Landing Policy.	55
	5.5.	Landing Gear and Flap Operating Policy.	56
	5.6.	Outside Observer/ACM Duties.	56
	5.7.	Seat Belts.	56
	5.8.	Aircraft Lighting.	56
	5.9.	Portable Electronic Devices.	57
	5.10.	Tobacco Use on Air Force Aircraft.	57
	5.11.	Advisory Calls.	57
Table	5.1.	Nonprecision Approaches.	58
Table	5.2.	Precision Approaches	58
Table	5.3.	Climb Out.	58
Table	5.4.	Descent.	58
	5.12.	Communications Policy.	59
	5.13.	Transportation of Pets.	60
	5.14.	Alcoholic Beverages.	60
	5.15.	Runway, Taxiway and Airfield Requirements:	60
Table	5.5.	RCR Values.	62
	5.16.	Aircraft Taxi and Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.	63
	5.17.	Not Used.	64
	5.18.	Fuel Jettison Procedures.	64
	5.19.	Aircraft Speed.	65
	5.20.	Bird/Wildlife Aircraft Strike Hazard (BASH) Programs.	65
	5.20.	(934AW) The purpose of the BASH program.	66
	5.21.	FCFs, ACFs, and OCFs.	67
	5.22.	Participation in Aerial Events.	68
	5.23.	Hand-held (HH) GPS with Laptops for Moving Map Display (MMD).	68
	5.24.	Traffic Alert and Collision Avoidance System (TCAS).	68
	5.25.	Radar Altimeter.	69
	5.26.	Buddy and Windmill Taxi Starts.	69
	5.27.	Reduced Power Operations (N/A for 3 Engine Operations).	69

5.28. Aircraft Recovery from Unprepared Surfaces. 70

Chapter 6—AIRCREW PROCEDURES 71

Section 6A—Pre-Mission 71

6.1. Aircrew Uniform. 71

6.2. Personal Requirements. 71

6.3. Pre-Mission Actions. 73

6.4. Aircrew Publications Requirements. 74

6.4. (934AW) 934 AW Aircrew. 74

Table 6.1. Aircrew Publications. 74

6.5. Airfield Review. 75

6.6. Aircrew Intelligence Briefing. 75

Section 6B—Predeparture 75

6.7. Integrated Management Tool (IMT) Account. 75

6.8. Flight Crew Information File (FCIF). 75

6.9. Flight Crew Bulletins (FCB). 76

6.10. Mission Kits. 76

6.10. (934AW) Navigators. 76

6.11. Route Navigation Kits. 77

Table 6.2. Route Navigation Kit Contents 78

6.12. Briefing Requirements. 78

6.13. Call Signs. 79

6.14. Instrument Flight Rules. 80

6.15. Flight Plan/Data Verification. 80

6.16. Departure Planning. 81

6.17. Weather Minimums for Takeoff. 83

6.18. Alternate Planning. 83

6.19. Departure Alternates. 84

6.20. Destination Requirements 84

6.21. Adverse Weather. 85

6.22. Operational Risk Management (ORM). 87

Section 6C—Preflight 87

6.23. AFTO IMT 781. 87

6.24. Aircraft Servicing and Ground Operations. 87
6.25. Aircraft Recovery Away from Main Operating Base. 89
6.26. Life Support Requirements. 89
6.27. Fleet Service. 91
6.28. Cargo Documentation. 91
6.29. Airlifting Hazardous Cargo. 92
6.30. Handling of Classified Cargo, Registered Mail, Mission Capable Parts (MICAP), Very, Very Important Part (VVIP), Forward Supply System (FSS) Shipments, and Courier Material. 93

Section 6D—Departure 94
6.31. On Time Takeoffs. 94
6.32. NVG Departures. 94

Section 6E—En Route 94
6.33. Flight Progress. 94
6.34. Navigational Aid Capability. 96
6.35. CIRVIS and Other Reports. 97
6.36. In-flight Meals. 97
6.37. Communications. 97
6.38. In-flight Emergency Procedures. 98
6.39. Need for Medical Assistance. 98
6.40. Weather Forecasts. 98

Section 6F—Arrival 99
6.41. Descent. 99
6.42. Instrument Approach Procedures. 99
6.43. NVG Approach and Landing. 101
6.44. Unscheduled Landings. 101
6.45. Maintenance. 102
6.46. Border Clearance. 102
6.47. Insect and Pest Control. 106

Section 6G—Miscellaneous 107
6.48. Dropped Objects. 107
6.48. (934AW) Dropped Objects. 107
6.49. Cockpit Voice Recorder. 107

6.50. Aircrew Life Support and Dash 21 Equipment Documentation. 107
6.51. Passenger Restrictions. 109
6.52. Airfield Data Reports. 109
6.53. Impoundment of Aircraft. 109
6.54. Cockpit Congestion and Loose Objects. 109
6.55. Wake Turbulence Avoidance. 109
6.56. Overflying En Route Stops. 109
6.57. Ordnance Procedures. 109
6.58. Classified Equipment and Material. 110

Chapter 7—AIRCRAFT SECURITY 112

7.1. General. 112
7.2. Security. 112
7.3. Air Force Installation Security Program. 112
7.4. Standby Aircraft Security. 112
7.5. En Route Security. 113
7.6. Detecting Unauthorized Entry. 113
7.7. Preventing and Resisting Hijacking. 114
7.8. Preventive Measures. 115
7.9. Initial Response. 116
7.10. In-Flight Resistance. 117
7.11. Communications between Aircrew and Ground Agencies. 117
7.12. Forced Penetration of Unfriendly Airspace. 117
7.13. Arming of Crew Members. 118
7.14. Force Protection. 119

Chapter 8—OPERATIONAL REPORTS AND FORMS 120

8.1. General. 120
8.2. AF IMT 457, USAF Hazard Report. 120
8.3. AF IMT 651, Hazardous Air Traffic Report. 120
8.4. AMC IMT 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet. 121
8.4. (934AW) All emergency situations. 121
8.5. Report Violations, Unusual Events, or Circumstances. 122
8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation. 125
8.7. Not Used. 128

8.8. AMC IMT 54, Aircraft Commander's Report on Services/Facilities. 128
8.9. AMC IMT 196, Aircraft Commander's Report on Crew Member. 128
8.10. AMC IMT 43, Transient Aircrew Facilities Report. 128
8.11. Not Used. 128
8.12. DD1748-2, Airdrop Malfunction Report (Personnel-Cargo). 128
8.12. (934AW) DD1748-2, Airdrop Malfunction Report (Personnel-Cargo). 128
8.13. AF IMT 4096, A 129
8.14. Operational Forms for Loadmasters. 129

Chapter 9—TRAINING POLICY 130

9.1. Passengers on Training Missions. 130
9.2. Touch-and-go Landing Limitations. 130
9.3. Training on Operational Missions. 130
9.4. Simulated Emergency Flight Procedures. 131
9.5. Not Used. 132
9.6. Night Vision Goggle Training. 132
9.7. Prohibited In-Flight Maneuvers. 132
9.8. Instructor Pilot Briefing. 132
9.9. Debriefing. 133
9.10. Simulated Instrument Flight. 133
9.11. Flight Maneuvers. 133
9.12. Operating Limitations. 133
9.13. Landing Limitations. 133
9.14. Actual Engine Shutdown and Airstart. 135
9.15. Windmill Taxi Start. 135
9.16. Aborted Normal Takeoff. 135
9.17. Aborted Maximum Effort Takeoff. 135
9.18. Maximum Effort Takeoff. 135
9.19. Training Aircraft Not Capable of Flight (Not applicable to AFRC and ANG). 136
Table 9.1. Training Flight Restrictions. 136

Chapter 10—AIRCREW OPERATIONS IN CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND HIGH-YIELD EXPLOSIVE THREAT ENVIRONMENT 139

10.1. Overview. 139
10.2. Understanding the CBRNE Threat. 139

10.3. CBRNE Passive Defense Measures. 140
10.4. Flight Operations. 142
10.5. Ground Operations. 143
Table 10.1. Work Degradation Factors. 145
Table 10.2. Ten-Foot Rule Time Standards (Source: 145
Chapter 11—NAVIGATION PROCEDURES AND FORMS 146
11.1. General. 146
11.2. Mission Planning Procedures. 146
11.3. Flight Planning. 146
11.4. Equal Time Point Computations. 147
11.5. Flight Charts. 147
11.6. In-flight Procedures. 147
11.7. Laptop Computers. 148
11.8. Flight Records. 148
11.9. Celestial Procedures. 150
11.10. Deviation Check Procedures. 150
11.11. True Airspeed (TAS) Check Procedures. 150
11.12. In-flight Fuel Management Procedures. 150
11.13. Airborne Radar Approach Procedures. 152
11.14. Grid Procedures. 153
Figure 11.1. ETP Computations. 157
Figure 11.2. Example AF IMT 4116. 161
Figure 11.2. Log Example (Continued) 161
Figure 11.2. Log Example (Continued) 161
Figure 11.2. Log Example (Continued) 161
Figure 11.3. ARA Pattern Construction Procedures. 162
Figure 11.4. AF IMT 4125, Range Control Chart. 163
Chapter 12—FLIGHT ENGINEER/AIRCREW MAINTENANCE SUPPORT PROCEDURES 164
12.1. General. 164
12.2. Responsibilities. 164
12.3. Authority to Clear Red X Symbols. 164
12.4. Aircraft Servicing. 164
12.5. Not Used. 166

12.6. Aircraft Structural Integrity Program. 166
12.7. Aircraft Systems/Forms Management. 166
12.8. Performance Data Computations. 166
12.9. AF IMT 4108, C-130 Fuel Log. 167
12.10. Tactical Checklist. 171
12.11. General. 171

Chapter 13—CARGO AND PASSENGER HANDLING PROCEDURES 172

13.1. General. 172
13.2. Responsibilities of Aircraft Loading. 172
13.3. Emergency Exits and Safety Aisles. 173
13.4. Pre-mission Duties. 173
13.5. Passenger Handling. 175
13.6. Over-Packed Meal Procedures: 177
13.7. En Route and Post Flight Duties. 177
13.8. Loaded Weapons. 177
13.9. Weight and Balance. 177
13.10. Cargo Validation On-loading and Off-loading Procedures and Format. 178
13.11. Emergency Airlift of Personnel. 178
13.12. Rucksacks. 178
13.13. Flight Station and Troop Compartment. 178
13.14. Cargo and MHE Issues. 179
13.15. Body Fluid/Bio-Hazard Clean-Up. 179

Chapter 14—FUEL PLANNING 180

14.1. General. 180
14.2. Fuel Conservation. 180
14.3. Fuel Planning. 181
14.4. TO 1C-130xx1-1 Fuel Planning. 183
14.5. CFPS Fuel Planning. 184
Table 14.1. Fuel Planning Publications. 185
Table 14.2. Fuel Load Components. 185
Figure 14.1. C-130 Fuel Plan (-1 -1) Example. 186
Figure 14.2. C-130 Fuel Plan (CFPS) Example. 187
Figure 14.3. Multi-Leg Fuel Plan (CFPS) Example. 188

14.6. ACFP Fuel Planning. 188
14.7. Multi-Leg Fuel Planning. 188

Chapter 15—INTENTIONALLY LEFT BLANK 190

15.1. This chapter is not used for C-130 operations. 190

CHAPTER 16—COMBAT MISSION PLANNING 191

16.1. General. 191
16.2. DZ Restrictions. 191
16.3. Route Planning. 191

Chapter 17—AIRLAND EMPLOYMENT 196

17.1. General. 196
17.2. Passengers on Tactical Flights. 196
17.3. ARA. 196
17.4. Tactical Arrivals. 196
17.5. Engine Running On-load and Off-load (ERO) Procedures. 197
17.6. Combat Off-load Procedures. 199
17.7. Emergency Airlift of Personnel. 201
17.8. NVG Airland. 202

Chapter 18—AIRCRAFT FORMATION 204

18.1. General. 204
18.2. Specified Times. 204
18.3. Weather Minimums. 204
18.4. Ground Operations. 204
18.5. Takeoff. 204
18.6. Altimeter Setting. 204
18.7. Formations. 204
18.8. Visual Geometries. 205
18.9. Visual Rejoins. 206
18.10. Tactical Formation Maneuver Restrictions. 206
18.11. Visual Slowdown Procedures. 206
18.12. Visual Airdrop Procedures. 206
18.13. Visual Recovery. 206
18.14. Landing. 206

18.15. SKE Procedures. 206
18.16. Loss of SKE-Individual Aircraft. 207
18.17. SKE Rejoins. 207
18.18. SKE Airdrop Procedures. 208
18.19. SKE Formation Landing. 208
18.20. C-130E/H/J Interfly Procedures. 208

Chapter 19—AIRDROP **210**

19.1. General. 210
19.2. Identification of Airdrop Items. 210
19.3. Airdrop Kits. 211
19.4. Joint Air Drop Inspection. 211
Table 19.1. Load Planning Restrictions. 211
19.5. Verification of Load Information. 212
19.6. Marking Airdrop Loads. 212
19.7. DZ Markings. 212
19.8. Safety Equipment. 212
19.9. Secure En Route Communications Package (SECOMP). 214
19.10. Airdrop Weather Minimums and Wind Restrictions. 214
19.11. Tactical Checklists. 214
19.12. Airdrop Altitudes and Airspeeds. 214
19.13. No Drop Decisions. 215
19.14. Drop Zone Communications. 215
19.15. Methods of Aerial Delivery. 215
19.16. High Altitude Airdrop Oxygen Requirements. 218
Table 19.2. Prebreathing Requirements and Exposure Limits for High Altitude Operations. .. 220
19.17. High Altitude Airdrop Loadmaster Requirements. 220
19.18. High Altitude Operational Requirements for Physiology Technicians. 221
19.19. High Altitude Airdrop PT Duties. 221
19.20. High Altitude Airdrop Conduct of Operations. 221
19.21. High Altitude Personnel Airdrop Procedures. 222
19.22. High Altitude Cargo Airdrop Procedures. 222
19.23. Personnel Airdrops. 222
19.24. Tailgate Airdrop Procedures. 224

19.25. Combination Airdrops. 224
19.26. Door Bundle Airdrops. 225
19.27. Equipment Airdrops. 226
19.28. Heavy Equipment airdrops with the Extraction Parachute Jettison System (EPJS). 226
19.29. CDS Airdrops. 226
19.30. Combat Rubber Raiding Craft (CRRC) Airdrops. 227
19.31. Free-Fall Airdrops. 227
19.32. High Velocity CDS Airdrops. 227
19.33. Container Ramp Bundles. 228
19.34. SATBs. 230
19.35. NVG Airdrop Procedures. 230
19.36. Emergency Procedures. 230
19.37. Emergency Parachutist Bail Out Procedures. 230
19.38. Towed Parachutist. 231
19.39. Equipment Emergency Procedures. 234
19.40. CDS Emergency Procedures. 237
19.41. CRRC Emergency Procedures. 238
19.42. Container Ramp Bundle Emergency Procedures. 238
19.43. Standard Airdrop Training Bundle Emergency Procedures. 238
19.44. High Altitude Emergency Procedures. 239

Chapter 20—AEROMEDICAL EVACUATION 240

20.1. Mission. 240
20.2. Operational Control and Reporting of Aeromedical Evacuation Forces. 240
20.3. Alerting Procedures. 240
20.4. Pilot in Command Responsibilities. 241
20.5. Loadmaster Responsibilities. 241
20.6. Aeromedical Evacuation Crew Responsibilities. 242
20.7. Ground Operations. 242
20.8. Refueling Operations. 242
20.9. Aircraft Configuration. 243
20.10. Passengers and Cargo. 243
20.11. Crash/Fire/Rescue. 244
20.12. AE Call Sign/Use of Priority Clearance. 245

20.13. Load Message. 245
20.14. ERO Procedures. 245
20.15. Floor Loading Procedures. 245
Figure 20.1. Floor Loading Litters 247
Chapter 21—EMERGENCY NUCLEAR AIRLIFT (ENAF) 248
21.1. General. 248
21.2. Conduct of Operations. 248
21.3. Emergency Nuclear Airlift Standards. 248
21.4. Aircrew Selection. 248
21.5. Aircrew Requirements. 249
21.6. Aircrew Briefings. 249
21.7. En Route Procedures. 249
21.8. Custody of Nuclear Cargo. 250
21.9. Security Procedures. 251
21.10. Emergency Procedures. 251
21.11. Maintenance on Aircraft Loaded with Nuclear Cargo. 252
21.12. Emergency Nuclear Airlift Operations Guide. 253
21.13. Prior to On-load. 253
21.14. Arrival and On-load. 253
21.15. En Route to Offload. 254
21.16. Off-load. 255
Chapter 22—SEARCH AND RESCUE PROCEDURES 256
22.1. General. 256
22.2. Communications with a Distressed Aircraft: 256
Table 22.1. Communications Frequencies. 257
22.3. Lost Aircraft Procedures. 258
Figure 22.1. Lost Airplane Fixing Procedures 259
22.4. Aircrew Search Briefings: 259
22.5. Planning the Search. 260
Figure 22.2. Parallel Search Pattern in a Large Rectangular Area. 262
Figure 22.3. Parallel Search Pattern Along Object’s Route of Flight. 262
Figure 22.4. Creeping Line Search Along Object’s Route of Flight. 263
Figure 22.5. Sector Search. 263

Figure 22.6. Creeping Line Pattern Used in Lieu of Square Search. 264
Figure 22.7. Expanding Square Search. 264
Table 22.2. Sweep Width For Visual Search in Nautical Miles. 264
Table 22.3. Whitecap Correction Factors 265
Table 22.4. Cloud Cover Factors 265
Table 22.5. Expected Detection Range for Visual Aids (30 Miles Visibility). 265
Table 22.6. Recommended Search Altitudes. 266
22.6. Search Procedures: 266
Table 22.7. Wind and Sea Prediction Chart. 269
Table 22.8. Sector Search Pattern Computation. 272
Figure 22.8. Contour Search of Mountain Peak 273
Figure 22.9. Contour Search of Mountain Side 273
22.7. Sighting Procedures: 274
22.8. Scanning Techniques. 276
22.9. Departing Search Area: 276
22.10. Adopted Forms. 276
22.11. Prescribed Forms. 278

Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION 279

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. This Air Force Instruction (AFI) provides policy for operating the C-130E/H, LC-130 and WC-130 model aircraft. It is an original source document for many areas but, for efficacy, restates information found in aircraft flight manuals, flight information publications (FLIP), and other Air Force directives. When guidance in this AFI conflicts with another basic/source document, that document takes precedence. For matters where this AFI is the source document, waiver authority is in accordance with (IAW) **paragraph 1.4**. For matters where this AFI repeats information in another document, follow waiver authority outlined in the basic/source document.

1.1.2. Unit commanders and agency directors involved with or supporting C-130 operations shall make current copies of this AFI available to appropriate personnel. Transportation and Airfield Management passenger manifesting agencies will maintain a current copy of this AFI.

1.2. Applicability. This AFI applies to aircrew members, support personnel, and managers involved with employing C-130 aircraft.

1.2. (934AW)Applicability. These procedures apply to all 934 Airlift Wing (934 AW) personnel, assigned or attached, who participate in flying activities.

1.3. Key Words Explained.

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

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

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

1.3.4. **"NOTE"** indicates operating procedures, techniques, etc., considered essential to emphasize.

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

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

1.4. Deviations and Waivers. Do not deviate from policies in this AFI except when the situation demands immediate action to ensure safety. The Pilot in Command (PIC) is vested with ultimate mission authority and responsible for each course of action they choose to take.

1.4.1. Deviations. The PIC shall report deviations or exceptions taken without a waiver through command channels to their Chief, Major Command (MAJCOM) Stan/Eval who in turn shall notify Chief, AMC Stan/Eval (lead command) as appropriate for follow-on action.

1.4.2. Waivers. Unless otherwise directed, waiver authority for contents of this instruction is the MAJCOM/A3/DO with mission execution authority. Obtain waivers to deviate from provisions in this AFI via MAJCOM Stan/Eval.

1.4.2.1. Permanent waivers affect theater unique circumstances and are enduring in nature. List MAJCOM/A3/DO-approved permanent waivers in the MAJCOM supplement (see **paragraph 1.5**).

1.4.2.2. Long-term waivers affect multiple aircraft/multiple missions but are not permanent in nature (expire at a specific date/time). MAJCOM Stan/Eval shall send HQ AMC Stan/Eval (lead command) copies of MAJCOM/A3/DO-approved long-term waivers.

1.4.2.3. Short-notice waivers are for specific missions in execution. PICs shall use the Waiver Protocol procedure in **Chapter 4** to secure MAJCOM/A3/DO approval for short-notice waivers.

1.5. Supplemental Procedures. This AFI is a basic directive. Each user MAJCOM or operational theater may supplement this AFI according to AFPD 11-2, *Aircraft Rules and Procedures* and AFI 33-360, Volume 1, *Publications Management Program*. Stipulate unique MAJCOM procedures (shall not be less restrictive than this basic document) and publish MAJCOM/A3/DO-approved permanent waivers in the MAJCOM supplement.

1.5.1. Combined Command Operations. Plan and conduct all operations that include forces from multiple MAJCOMs using provisions in this AFI. Do not assume or expect aircrews to perform MAJCOM/Theater unique procedures without owning MAJCOM/A3/DO approval and advance training.

1.5.2. Coordination Process. Forward MAJCOM approved supplements (attach AF Forms 673, *Air Force Publication/Form Action Request*) to MAJCOM/A3V. MAJCOM/A3V shall facilitate the MAJCOM/A3 and HQ AFFSA/XOF approval process.

1.6. Local Supplement Coordination Process. Operations Group commanders (OG/CCs) shall define local operating procedures to this instruction in a unit supplement. OG/CCs shall obtain review from Numbered Air Force (NAF), if applicable, and MAJCOM prior to releasing their supplement. Send an electronic copy of the approved version to MAJCOM/A3V, or NAF/DO (if applicable). MAJCOM/A3V will send approved copies to AMC/A3V.

1.7. Requisition and Distribution Procedures. Unit commanders shall use AFI 36-161, *Distribution Management* procedures to provide aircrew members and associated support personnel current copies and changes to this AFI.

1.8. Improvement Recommendations and Review. Send comments and suggested improvements to this instruction on an AF Forms 847, *Recommendation for Change of Publication*, through channels to HQ AMC/A3V, 402 Scott Drive Unit 3A1, Scott AFB IL, 62225-5302 IAW procedures in AFI 11-215, *Flight Manual Procedures* and MAJCOM Supplement. HQ AMC/A3V will normally lead a MAJCOM level review of this instruction within six months of the publication of a respective AFTTP 3-3.

1.9. Definitions. Find explanations or definitions of terms and abbreviations commonly used in the aviation community in Code of Federal Regulations (CFR) Title 14, Part 1; *DOD FLIP General Planning*, Chapter 2; and Joint Pub 102, *The DOD Dictionary of Military and Associated Terms*. See **Attachment 1** for common terms used herein.

1.10. Aircrew Operational Reports. The reporting requirements in this instruction are exempt from licensing IAW of AFI 33-324, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information.*

Chapter 2

COMMAND AND CONTROL

2.1. General. The MAF command and control (C2) network consists of the following C2 centers: 618 Tanker Airlift Control Center (618 TACC) Global Cell, 613 AOC/AMD (PACAF), 603 AOC/AMD (USAFE), ANG Readiness Center, AFRC Command Center, theater Air and Space Operations Centers (AOC), Air Mobility Division (AMD), Joint Operational Support Airlift Center (JOSAC), Unit Command Posts, Air Mobility Control Centers (AMCC), Contingency Response Groups (CRG), and Special Tactics Teams (STT). C2 centers are action agents for the MAF commander with execution authority (operational control) over mobility missions/forces.

"NOTE: For 613 AOC/AMD controlled missions, refer to PACAFI 10-2101 for C2 procedures."

2.2. Execution Authority. Headquarters commanders with command authority over MAF resources hold execution authority for directed missions. Commanders with execution authority formulate plans, allocate assets, and approve missions through a local command post or C2 element. OG/CCs serve as execution authority for local training missions. The PIC will execute missions operating outside normal communication channels (use last known mission orders or best course of action).

2.2. (934AW)The 934th Supervisor of Flying (SOF) is the direct representative of the 934 OG/CC. The SOF program will be administered IAW AFI 11-418_934AWSUP.

2.2.1. Off-Station Trainer (OST). Refer to AMCI 11-208, *Tanker/Airlift Operations,* for procedures and requirements governing OSTs.

2.2.1.1. AFRC Current Operations (AFRC/DOOM) is approval authority for AFRC Unit Equipped (UE) OSTs.

2.3. Pilot in Command Responsibility and Authority. SQ/CCs shall designate an aircraft commander (AC), instructor pilot (IP), or evaluator pilot (EP) as the PIC for all flights, on a flight authorization form, IAW AFI 11-401, *Aviation Management*, and applicable supplements. An unqualified or non-mission ready pilot may not be designated as PIC. PICs are:

2.3.1. In command of all persons aboard the aircraft.

2.3.2. Vested with authority to accomplish the assigned mission. The PIC shall only fly events authorized in the mission tasking unless in the PIC's judgment an emergency condition demands otherwise. Fly unscheduled training events (for example, transition training) after obtaining approval of the execution authority.

2.3.3. The final mission authority and will make decisions not assigned to higher authority.

2.3.4. The final authority for requesting and accepting aircrew or mission waivers.

2.3.5. Responsible for passing mission progress reports (at least daily) to C2 agents.

2.3.6. Responsible for interaction between aircrew members and mission support personnel and will establish a point-of-contact (POC) with the appropriate C2 agent prior to entering

crew rest. Local C2 agents are responsible for coordinating mission support requirements on the PIC's behalf.

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

2.3.8. Responsible for obtaining and maintaining an IMT account to access Aircrew Departure Papers.

2.4. Mission Clearance Decision. The execution authority and PIC shall make the mission clearance decision. In all cases, final responsibility for the safe conduct of the mission rests with the PIC. If a PIC elects to delay a mission, that mission will not depart until the conditions that generated the decision to delay improve or are resolved. Further, no execution authority may task another PIC to take the same mission under the same conditions.

2.4.1. Only re-route or divert a mission when authorized by the execution authority, to resolve an emergency, or if required by en route or terminal weather conditions.

2.4.2. The agent that directed the re-route or divert shall ensure the aircraft is capable of executing departure, en route, and destination arrival procedures.

2.4.3. The PIC will notify the appropriate C2 agent of any aircraft or aircrew limitation that may preclude re-route or divert.

2.4.4. When a C2 agent directs a PIC to fly to an alternate airfield, the agent will ensure existing and forecast weather for the alternate, Notices to Airmen (NOTAMs), and airfield information from the Global Decision Support System (GDSS)/GDSS2/Airfield Suitability and Restrictions Report (ASRR) is suitable. If the alternate becomes unsuitable while en route, the PIC will coordinate with the C2 agent for other suitable alternates. The PIC is final authority for accepting a suitable alternate. A C2 agent will alert customs and all appropriate ground service agencies of the aircraft's impending arrival.

2.5. Operational C2 Reporting.

2.5.1. Stations With MAF C2 Agency. Local MAF C2 agents will enter mission data (arrival, departure, and advisory messages in the MAF C2 system.

2.5.2. Stations Without MAF C2 Agency. Transmit mission data to the controlling C2 agency by any means available (i.e., Defense Switching Network (DSN), high-frequency (HF) radio, Iridium phone and L-Band satellite communication (SATCOM), etc.). HF radio is the primary method of communication for routine mission information. For critical C2 communications, i.e. aircraft waiver request, maintenance delay, etc., voice communications are the primary method with L-Band SATCOM as the backup.

2.5.3. En route Reporting.

2.5.3.1. Make the following enroute calls to 618 TACC or theater C2 agency, as required:

2.5.3.1.1. Airborne call when departing from a location without an AMC presence.

2.5.3.1.2. Maintenance call whenever aircraft alpha status changes to code 3.

2.5.3.1.3. On aeromedical evacuation missions, no later than 1 hour prior to landing, to update arrival time.

2.5.3.2. CONUS. Periodic "ops normal" calls/transmissions are not required; however, the controlling C2 agency may increase reporting requirements.

2.5.3.3. OCONUS. MAJCOM C2 agencies will specify increased reporting procedures through a communications plan in the OPLAN, OPORD, FRAG, Mission Directive, or FLIP. Aircrews will maintain listening watch in accordance with the communications plan within aircraft equipment capabilities (e.g. HF-Automatic Link Establishment (HF-ALE), L-Band SATCOM, Combat Track II (CTII)).

2.5.4. Aircraft Status/Maintenance Discrepancy Reporting. PICs shall report aircraft system malfunctions that traditionally require extensive trouble shooting as soon as feasible. Contact arrival C2 agency if available, otherwise contact MAJCOM C2 for relay.

2.5.5. Not Used.

2.5.6. "Thirty Minute" Out Call. Transmit a UHF or VHF arrival advisory to the destination C2 agency approximately 30 minutes prior to arrival. Provide Estimated Time in Blocks (ETB).

2.5.7. Integrated Flight Management (IFM) Sorties. On IFM sorties the flight managers (FM) will be the C2 conduit for aviators. For critical C2 communications, voice communications (HF, DSN, Iridium Phone, etc.) are the primary method. The PIC will contact the flight manager before signing the flight plan for each sortie.

2.5.7.1. Position Reporting on IFM Missions. IFM missions transiting oceanic flight information regions (FIRs) need to add the phrase "Pass to Hilda" to Air Traffic Control (ATC) position reports. Crews may also use the ARINC frequencies listed in the aircrew flimsy for C2 phone patch requirements. Use ARINC phone patch only after exhausting normal communication methods.

2.5.7.2. Crews must also receive a verbal tactics and intel briefing on the leg prior to entry into a hostile area/combat zone.

2.5.8. HF Communications. HF is the primary means of access to the worldwide C2 network.

2.5.9. L-Band SATCOM. L-Band SATCOM provides a worldwide communications capability (secondary to HF). L-band SATCOM may be used for routine communication if the message is unclassified. Due to large volume of traffic, MAJCOM C2 will only forward 3-hour out or other L-Band messages when specifically requested. In this case, the L-Band message to MAJCOM C2 must include, "Relay, no C2 agent (or negative HF contact) at (include station name)" in the message remarks.

2.5.9.1. Employment. Limit SATCOM communications to operational traffic. Turn the transceiver and laptop on during preflight and leave it configured to transmit and receive messages until aircraft power down at destination. For missions operating through sensitive or classified locations disable the Global Positioning System (GPS) position-reporting feature.

2.5.9.2. Home Station. Operations groups will be responsible for storing, maintaining day-to-day control, and administrative accountability of computers. Crews departing home station without a laptop computer will inform 618 TACC or theater C2 agency.

Laptops stay with crew not airplane. ***EXCEPTION:*** For unit deployments, deployed commanders may develop alternate laptop transfer procedures for deployed crews.

2.5.9.3. En route. Issue one laptop to each crew; including stage crews.

2.5.9.3.1. Laptops may be secured aboard aircraft which have been modified with a suitable secure container. On aircraft lacking a suitable secure container, computers will be stored in the command post or other suitable MAF C2 Center.

2.5.9.4. Staging Operations. Control procedures should ensure crews maintain original laptop computer issued by home station. Do not store laptop computers on aircraft during staging operations.

2.5.9.5. L-Band SATCOM Messages and Advisories.

2.5.9.5.1. On-station Message. Transmit an on-station message at the beginning of each crew duty day.

2.5.9.5.2. Arrival Advisory. IAW **2.5.6**.

2.5.9.5.3. Advisories. Transmit (free-text messages) mission delay, in-flight refuel, on/off-load reports.

2.5.9.5.4. When using L-Band SATCOM, include "TACC please confirm addressee received this message," in remarks field.

2.5.10. Not Used.

2.5.11. DV Messages. Airborne unclassified messages originated by DV passengers may be transmitted at the discretion of the PIC.

2.5.12. Iridium Phones. Crews are authorized to use Iridium phones in VMC with the following restrictions:

2.5.12.1. Limit in-flight phone use to cruise (normally above 10,000 feet AGL) altitude. The phone shall be off during takeoff, climb/departure, descent/approach, and landing phases of flight.

2.5.12.2. Do not use Iridium phones if AAR-47 and/or ALE-47 systems are required for mission accomplishment.

2.5.12.3. Do not transmit on secure radios if coupling the Iridium phone to the aircraft intercom system using the Iridium Subscriber Unit (ISU). To ensure security of classified transmissions, disconnect the ISU and Iridium phone from the intercom before using secure radios.

2.5.13. Combat Track II. Combat Track II (CTII) provides two-way, beyond-line-of-sight (BLOS), secure communication text messaging between multiple ground and airborne nodes. It also provides in-flight following via automatic Global Position System (GPS) position reports displayed on standard digital navigation charts, when installed on the aircraft.

2.5.13.1. Employment. The aircraft equipment will be turned on during preflight/engine start and remain configured to transmit and receive at all times until aircraft power down upon mission completion.

2.5.13.2. Home Station. CTII units at home station are intended for training use only. Unless specifically designated by the C2 agency do not deploy with home station equipment.

2.5.13.3. Operational Missions. For operational missions, CTII will be provided at stage locations or deployed locations for missions requiring the capability. Every effort should be made to return the equipment to the stage location. Equipment stationed at a deployed location stays at that location as units rotate through.

2.6. Mission Commander (MC).

2.6.1. Unit commanders shall designate an MC when more than two aircraft are assembled to perform missions away from home station. Unit commanders should consider appointing a MC for special, high-visibility missions (i.e. CAPSTONE, DV2, etc.). The MC has overall responsibility and is the final authority for decisions that impact mission execution. The MC shall properly coordinate mission details. For flight-managed sorties, MC shall coordinate any special mission planning requirements with the IFM mission allocator not later than 24 hours prior to mission execution.

2.6.1.1. For MAJCOM-tasked missions, MAJCOM/A3/DO will coordinate and designate a lead planning agency when more than one unit is involved in an airdrop, or tactical airland operation. For theater airlift missions with more than one airlift unit involved, the theater AOC shall designate a central planning agency responsible for coordinating the entire mission with all involved agencies. The OG/CC for the lead planning agency will designate an MC. The MC will be a rated (normally field grade) officer qualified in the type mission.

2.6.1.2. The MC will ensure all collocated aircrew members attend required briefings.

2.6.1.3. When non-collocated, the MC (in conjunction with the lead planning agency) will ensure non-collocated aircrew members receive applicable information, to include rendezvous, formation, abort, and recovery procedures. The MC will provide controlling agency and all non-collocated PICs anticipated delays or mission changes.

2.7. Not Used.

2.8. C2 Agency Telephone Numbers. **Table 2.1** contains a list of 618 TACC phone numbers. Crewmembers may also use the 618 TACC toll-free number, 1-800-AIR-MOBL, to contact other offices within the 618 TACC, including flight managers.

Table 2.1. 618 TACC Mission Controller Phone Numbers.

TYPE OF MISSION	618 TACC PHONE NUMBER
Contingency and Air Refueling	DSN 779-0320
Channel	DSN 779-0321
Joint Airborne/Air Transportability Trainer (JA/ATT)	DSN 779-0322
Special Assignment Airlift Missions and Exercises (SAAM)	DSN 779-0323
All Other	DSN 779-0324

2.9. Close Watch Missions. Close Watch missions (for example, Combat Search and Rescue (CSAR); Aeromedical Evacuation (AE), PHOENIX BANNERs) receive special C2 attention. PICs will promptly notify appropriate C2 agency of delays, aborts, or other events that affect on-time departure. Provide the C2 agent the estimated time in commission (ETIC), planned Estimated Time of Departure (ETD), and estimated time of arrival (ETA) within 10 minutes of the event or as soon as safety allows.

2.10. Law Enforcement Support. It is the policy of the Department of Defense (DOD) to cooperate with civilian law enforcement officials to the maximum extent practicable. AFI 10-801, *Assistance to Civilian Law Enforcement Agencies*, provides the policies and procedures service members must follow when supporting federal, state, and local civilian law enforcement agencies. Coordinate all civilian law enforcement authorities' requests for assistance through appropriate C2 channels.

2.11. Enroute Maintenance Support. 618 TACC/XOCL will support all mobility aircraft requests for parts and/or maintenance assistance regardless of type of mission or component. Refer to paragraph **2.8** for 618 TACC telephone numbers.

Chapter 3

AIRCREW COMPLEMENT/MANAGEMENT

3.1. General. This chapter provides guiding principles to form/manage mobility aircrews. Commanders at all levels shall follow this policy to form aircrews and to develop aircrew-related work/rest schedules that optimize efficiency of mobility forces engaged in worldwide operations.

3.2. Aircrew Complement. SQ/CCs shall form aircrews based on fragmentation order/mission directive, Crew Duty Time (CDT) and Flight Duty Period (FDP) requirements, aircrew member qualifications, and other constraints to safely accomplish the mission tasking. **Table 3.1** summarizes crew position requirements for different crew types. ***EXCEPTION:*** Crew complement for specialized mission (e.g. Aerial Spray, Ski, and MAFFS) is addressed in the Addendas covering those missions.

Table 3.1. Aircrew Complement.

Crew Position	Basic	Augmented	Tactical
Aircraft Commander	1	2 (1)	1
Co-Pilot or MPD Pilot	1	1	1
Navigator	1 (2)	2	1 (2)
Flight Engineer	1	2	1
Loadmaster	1 (3) (4)	2	1/2 (5)

Notes:

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

*****(2) Sq/CCs may authorize training/FCF/OCF flights a navigator when not required for mission accomplishment. Units will establish procedures regarding the use of navigators on proficiency trainers. Formal Training Units (FTUs) will establish procedures regarding the use of navigators on all training missions.

- Navigators are required for training missions if reported/forecasted weather or if other inclement weather exists. EXCEPTION: Units with APN-241 color weather radar.

- Navigators are required for training mission conducted below 3000 ft AGL outside of radar control.

- Navigators are not required when conducting unaided Day/Night LZ operations in the local area.

*(3) Two loadmasters may be required, at the unit commander's discretion, depending on mission complexity.

*(4) Two loadmasters or one loadmaster and another qualified crewmember are required if more than 40 passengers are scheduled to be carried (except during unit moves or contingencies). Both

crewmembers must remain in the cargo compartment, one forward and one aft for takeoffs and landings, or as required by the tactical situation.

*(5) Only one loadmaster is required for tactical missions (up to 13,000 feet MSL) if:

- Using only one paratroop door for personnel or door bundle drops (less than 100 lbs);
- Non-static line personnel are dropped from the ramp and door;
- Dropping only simulated airdrop training bundles (SATBs);
- A no-drop (dry pass) is planned and ground time is sufficient to permit on-load or off-load by one loadmaster;
- Dropping a single CDS container unilaterally using manual gate cut procedures

3.2.1. The minimum aircrew member complement for local flights is an aircraft commander, pilot/copilot, flight engineer and loadmaster. When a mission requires more than one aircrew member at a position, the SQ/CC will determine whether an instructor and a Non-Mission Ready (NMR) crewmember meet mission requirements.

3.2.1.1. **(Added-934AW)** A navigator is not required on local proficiency sorties to local training bases that have operational radar control.

3.2.2. SQ/CCs shall form augmented aircrews for missions planned to take longer than a basic CDT. Augmenting aircrew members must be current, qualified, and Mission Ready (MR) IAW AFI 11-2C-130, Vol 1, *Aircrew Training*. ***EXCEPTION:*** A NMR pilot may augment provided the other two pilots are MR IPs. SQ/CC shall augment an aircrew for the full FDP. The MAJCOM/A3/DO may augment aircrews while the flight is underway.

3.2.3. An additional flight engineer or scanner may be used for basic or augmented crews in those units without loadmaster Unit Manning Document (UMD) authorizations, provided no more than 30 passengers are carried or cargo exceeds 500-lbs (100-lbs maximum per single item) or requires special handling in accordance with AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipment*. ANG/AFRC units may use an additional flight engineer provided these provisions are met.

3.2.4. Tactical Airlift Formation Lead Requirements.

3.2.4.1. Definitions:

3.2.4.1.1. Flight Lead crew: consists of a pilot and navigator who are either flight lead qualified or are receiving lead upgrade training from an instructor of like crew position. Can accomplish mission commander duties and can lead 2 or more aircraft.

3.2.4.1.2. Element Lead crew: consists of a pilot and navigator who are either element lead qualified or are receiving element lead upgrade training from an instructor of like crew position. Can lead a 2-ship or perform element lead duties in a multiple element formation.

3.2.4.1.3. Deputy Lead crew: a flight lead crew that is ready to assume formation lead duties if the formation lead aborts. A deputy lead is required for formations greater than 4 aircraft. Deputy lead may fly as the number 2 aircraft in the first element or may fly as second element lead as long as no other aircraft occupies the number 2 position.

3.2.4.1.4. AWADS crew: consists of a pilot and navigator who are either AWADS qualified or are receiving AWADS upgrade training from an instructor of like crew position. Can drop in IMC.

3.2.4.1.5. An Element consists of 2 aircraft. A Flight consists of 3 or 4 aircraft.

3.2.4.2. Unilateral training Visual Meteorological Conditions (VMC) - no special requirements.

3.2.4.3. Unilateral training IMC.

3.2.4.3.1. Single-element formations. An element lead crew is required or one instructor pilot is required in the formation (any position). For IMC airdrops an AWADS crew is required in the formation lead position.

3.2.4.3.2. Multiple-element formation. A flight lead crew or instructor pilot is required in the formation lead and deputy lead (if required) positions and in each flight lead position. Element lead positions require a flight lead crew, element lead crew or instructor pilot. If deputy lead or an element lead aborts after station time, any crew can assume their position with the concurrence of the mission commander. Any crew can fly the last ship of a formation even if it is a deputy lead or element lead position. For IMC airdrops, the deputy lead crew and every crew in a flight lead position must also be an AWADS crew.

3.2.4.4. Other than unilateral (IMC and VMC). A flight lead crew is required in the formation lead and deputy lead positions (single element formations only require an element lead crew). Element lead positions require a flight lead or element lead crew. Any crew can fly the last ship of a formation even if it is a deputy or element lead position. For IMC airdrops, every crew in a flight lead position must also be an AWADS crew.

3.2.5. NVG Aircrew Complements. An NVG crew will consist of an NVG certified crewmember in each of the primary crew positions (a crewmember in upgrade supervised by a qualified instructor meets this requirement). However, the pilots, navigator, and engineer may use NVGs even if the loadmaster is not NVG certified. Loadmasters may use NVGs even if the pilots, navigator, or engineer are not NVG certified.

3.2.6. JPADS Aircrew Complement. JPADS/I-CDS crews consist of JPADS XL certified basic airdrop crew and a PADS Operator (PO). Navigators can serve as a primary crew member and PO on C-130E/H aircraft. The PO does not have to be MDS qualified but must be a rated airdrop qualified officer. It is essential the PO receive a thorough ACM briefing prior to performing duties on aircraft other than their primary MDS.

3.3. Aircrew Member Qualification. An aircrew member will be qualified or in qualification training to perform duties as a primary aircrew member.

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

3.3.2. Crewmembers who complete the Senior Staff Course will log “FP/FN” for Flight Authorization Duty Code on the AFTO IMT 781, **ARMS Aircrew/Mission Flight Data Document**.

3.3.3. Crewmembers who complete a Senior Staff Familiarization flight will log "OP/ON" for Flight Authorization Duty Code on the AFTO IMT 781.

3.4. Pilots. An IP must supervise non-current or unqualified pilots regaining currency or qualification (direct IP supervision during critical phases of flight).

3.4.1. SQ/CCs shall designate those additional pilots authorized to perform PIC duties. The PIC shall brief the aircrew on the plan to transfer PIC duties.

3.4.2. Not Used.

3.4.3. Missions With Passengers. Only current and qualified pilots (possessing an AF IMT 8, **Certificate of Aircrew Qualification**) will occupy pilot seats with passengers on board.

3.4.3.1. A non-current but qualified pilot under direct IP supervision may fly with passengers on board.

3.4.3.2. Pilots shall not fly touch-and-go landings with passengers on board. Touch-and-go and stop-and-go landings are authorized with MEP on board.

3.4.4. An AWADS or IMC airdrop qualified AC will be in the seat during IMC personnel airdrops.

3.5. Navigators. A non-current or unqualified navigator may serve as a primary aircrew member on any mission when supervised by a qualified instructor or flight examiner.

3.5.1. An AWADS or IMC airdrop qualified navigator will be in the seat during IMC personnel airdrops.

3.5.2. Grid Navigator requirement. SQ/CC shall include a grid-qualified navigator on aircrews tasked to fly north of 65°N latitude, south of 70°S latitude, or in airspace where FLIP en route charts indicate compass indications may be erratic or depict airways, tracks, or navigational aids as oriented to true or grid north (i.e. Canadian Northern Airspace). ***EXCEPTIONS:***

3.5.2.1. Flights within Alaskan airspace.

3.5.2.2. Flights on published airways using magnetic references. Destination and alternates must have published magnetic instrument approaches.

3.5.2.3. Aircraft equipped with two or more operable independent navigational systems.

3.6. Flight Engineers and Loadmasters. A non-current or unqualified flight engineer or loadmaster may serve as a primary aircrew member on any mission when supervised by a qualified instructor or flight examiner (direct supervision for critical phases of flight).

3.7. Aircrew Management. SQ/CCs and en route C2 agents shall ensure work/rest cycles permit an aircrew adequate time to safely accomplish mission duties and personal time for rest.

3.7.1. Flight Duty Period**.** FDP is the period of time starting at mission report time and ending immediately after the aircrew completes the final engine shutdown of the day. SQ/CCs shall form aircrews based on worst-case FDP in the mission directive. Reduce FDP when the autopilot fails after departure IAW information below. If the autopilot fails after the departure, consider mission requirements and determine the best course of action to preclude further mission delays due to reduced FDP. The best course of action may include

diverting to an airfield with maintenance capability. Contact C2, coordinate intentions, and comply with limitations.

3.7.1.1. Basic Crew FDP. The maximum FDP for a basic aircrew is 16 hours (12 hours when the autopilot is inoperative). If the autopilot fails after departure, consider mission requirements and determine the best course of action to preclude further mission delays due to reduced FDP. The best course of action may include diverting to an airfield with maintenance capability. Contact C2 to coordinate intentions, and comply with limitations. Once an aircrew begins a basic FDP, only MAJCOM/A3/DO may extend the FDP to an augmented day regardless of aircrew composition (MAJCOM/A3/DO shall augment basic crew to extend FDP).

3.7.1.1.1. When extended en route ground times, non-optimum routing/winds, weather delays or other extenuating circumstances will increase a basic to an augmented FDP, a PIC with an augmented crew may accept an augmented FDP as long as:

3.7.1.1.1.1. The C2 agent or PIC discovers the extenuating circumstances before the first takeoff of the day.

3.7.1.1.1.2. The PIC verifies all augmenting aircrew members can get adequate rest en route.

3.7.1.1.2. A PIC with a basic crew may seek MAJCOM/A3/DO (mission execution authority) approval to extend the FDP as much as 2 hours to complete a scheduled mission. Only use this provision to recover from unscheduled/unplanned en route delays. C2 agents shall not ask a PIC to exercise this option.

3.7.1.2. Augmented Crew FDP. Maximum FDP for an augmented aircrew is 18 hours (16 hours when the autopilot is inoperative). SQ/CC need only augment the pilot portion of the aircrew when the autopilot is inoperative.

3.7.1.3. Maximum FDP for nuclear airlift missions is 16 hours. 12 hours when the autopilot is inoperative (regardless of augmentation).

3.7.1.4. Flight examiners administering evaluations will not exceed an augmented FDP.

3.7.1.5. Training, Tactical, JA/ATT, and Functional Check Flights/Acceptance Check Flights (FCFs/ACFs) FDP:

3.7.1.5.1. Maximum FDP for training, tactical, and FCF/ACF missions is 16 hours (12 hours when the autopilot is inoperative). Conduct the mission as follows:

3.7.1.5.2. Complete all mission-related events (i.e., FCF/ACF checks, transition events, or tactical events) during the first 12 hours of the FDP.

3.7.1.5.2.1. ANG and AFRC crews may perform all mission-related events on local training missions provided their time from start of FDP does not exceed 16 hours.

3.7.1.5.2.1.1. Crew duty time (CDT) and FDP include both military and civilian work. CDT and FDP begin when an individual reports for their first duty period (military or civilian).

3.7.1.5.3. Crews may fly/deposition to home station or a deployed staging base following training (do not exceed 12 hours when the autopilot is inoperative).

3.7.2. Crew Duty Time. CDT is that period of time an aircrew may perform combined ground/flight duties. Plan the mission so aircrew members may complete post-mission duties within maximum CDT. An aircrew member may perform mission-related duties for other missions when approved by member's home station SQ/CC or equivalent. Maximum CDT is 18+00 hours for a basic aircrew and 20+00 hours for an augmented aircrew.

3.7.3. Except as outlined below, CDT/FDP begins 1 hour after aircrew alert notification. SQ/CC or equivalent may task aircrew members to perform other duties before they begin flight-related duties or MAJCOM/A3/DO may authorize a C2 agent to alert an aircrew member early: begin CDT/FDP when the first aircrew member reports for those duties.

3.7.3.1. For Self-alerts, the PIC shall coordinate early individual/crew mission report times with C2 agents. Begin CDT/FDP when the first aircrew member reports for duty.

3.7.3.2. CDT/FDP Extensions. See AFI 11-202V3, *General Flight Rules.*

3.7.3.3. For BRAVO standby: CDT/FDP begins when an aircrew member shows for duty.

3.7.4. Deadhead Time. IAW AFI 11-401, *Aviation Management*, deadhead time is the time computed traveling in passenger status. MAF aircrew members may deadhead for the purpose of positioning or de-positioning to perform a mobility mission or mission support function. Crewmembers may deadhead for a maximum of 24 hours. OG/CC or equivalent may approve crewmembers to deadhead in excess of 24 hours.

3.7.4.1. Current/qualified aircrew members may perform primary aircrew duties after flying in deadhead status provided they do not exceed a basic FDP (FDP starts at report time for deadhead flight).

3.7.4.2. Aircrew members may deadhead after performing primary crew duties for a maximum of 24 hours from the time the crewmember's FDP began.

3.7.5. Aircrew Member Support of Aircraft Generation Activities (Pre-flight, cargo on-/off-load, start, and taxi aircraft). Crew rest is required IAW AFI 11-202V3. The duty day begins when the aircrew member reports for official duties.

3.8. Scheduling Restrictions. IAW AFI 11-202V3. In addition, SQ/CCs shall not schedule an aircrew member to fly nor will an aircrew member perform aircrew duties:

3.8.1. When the flight will exceed maximum flying time limitations of AFI 11-202V3.

3.8.2. Within 12 hours of consuming alcoholic beverages (based on scheduled takeoff or ALFA standby force legal for alert time or earliest show time from BRAVO alert) or while under the influence of alcohol.

3.8.3. When using nasal sprays to treat symptoms of head congestion existing before flight. An aircrew member may use oxymetazoline or phenylephrine nasal sprays as "get-me-downs" following an unexpected ear or sinus block during flight.

3.9. Counter-Fatigue Management Program.

3.9.1. Aircrew may use medications with prior approval (on a voluntary basis following ground testing) that enhance natural rest during off-cycle crew rest periods. This section provides AMC/A3 guidance for the use of no-go pills (prescription medications) that help aircrew initiate and maintain restful sleep during off-cycle (desynchronosis) crew rest periods. Fliers on augmented aircrews shall not use no-go pills in flight.

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

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

3.9.4. Unit Operational Risk Management (ORM) programs shall include use of no-go medication with OG/CC and FS oversight. A basic counter-fatigue ORM model is available for mission planners, OG/CC, crew, and FS on the HQ AMC/A3V website.

3.9.5. Home station or deployed FS trained using the AMC/SG-approved (lead command) counter fatigue program is the point of contact for no-go prescription. Upon request, the FS will advise/assist the local OG/CC to identify missions that may impair crew rest caused by duty day length, departure and arrival times, and other mission timelines.

3.9.6. Aircrew members on Personnel Reliability Program (PRP) status will follow PRP notification procedures if prescribed no-go pills.

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

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

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

3.9.7.3. Off-station missions that are 4 or more time zones from home station.

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

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

3.9.8. SQ/CC will not schedule crewmembers to fly or perform crew duties within 12 hours of consuming no-go pills (consider duties not including flying (DNIF)). ***EXCEPTION:*** Commanders may reduce the 12-hour timeline after consult with a flight surgeon to confirm prescribed no-go pills have short duration effect [6 hours for ambien (zolpidem) and 4 hours for sonata (zaleplon)]. In no case will crewmembers consume a no-go pill on a timeline where they would be under the effect of the medication while they perform aircrew duties (use mission report or legal for alert time to determine latest time to take no-go medication).

3.9.9. Aircrew member's responsibilities:

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

3.9.9.2. Aircrew members shall not operate equipment within the DNIF periods for each of the no-go pills as specified in **paragraph 3.9.8** of this instruction.

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

3.9.9.4. Aircrew will inform the FS of any other medications (including nutritional supplements and over the counter medications) they are taking so the FS can evaluate potential interactions.

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

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

3.10. Crew Rest/En route Ground Time. OG/CCs shall establish procedures to place crewmembers in crew rest. MAJCOM/A3/DO may waive any portion of the crew rest period or ground time as needed to meet mission tasking.

3.10.1. Home Station Pre-Departure Crew Rest. For missions that will keep aircrew members off station 16 hours or more, unit commanders will enter primary and deadhead aircrew members into pre-departure crew rest at least 24 hours before the legal for alert time. Aircrew members may perform limited non-flying duties like mission planning during the first 12 hours of pre-departure crew rest. OG/CCs may waive any portion of the first 12 hours of pre-departure crew rest. Do not manifest deadhead aircrew members as passengers to deny pre-departure crew rest. ***EXCEPTION:*** AFRC, ANG and AETC in accordance with AFI 11-202V3 and appropriate supplement.

3.10.2. Off-station/En route Crew Rest. The minimum en route crew rest period is 12 hours before legal for alert or scheduled report time when self-alerting.

3.10.2.1. Except during emergencies or as authorized by MAJCOM/A3/DO, C2 agents shall not disturb an aircrew member in crew rest. When necessary to interrupt aircrew members' crew rest period, re-enter that aircrew in a subsequent minimum 12 hour crew rest period after they complete official duties.

3.10.2.2. Do not enter aircrew members into crew rest until they complete official post-flight duties. Those duties may include, but are not limited to, refueling, cargo on-/off-load, aircrew arming, minor maintenance, or mission debriefing.

3.10.3. Off-station/En route Ground Time. Mobility planners shall provide aircrews at least 16 hours (nuclear airlift missions will be IAW AFI 11-299, *Nuclear Airlift Operations*) ground time between engine shutdown and subsequent takeoff.

3.10.3.1. Missions planners, PICs, or C2 agents may modify normal ground time as follows:

3.10.3.1.1. In the interest of safety.

3.10.3.1.2. To start (mission reporting time) no earlier than 12 hours from the time the aircrew entered crew rest. Before reducing ground time, PICs will consider time to complete mission planning, cargo on-/off-load, and non-standard mission related duties. C2 agents will not ask PICs to accept less than 16 hours ground time.

3.10.3.2. Mobility planners should construct mission itineraries with en route ground times longer than 16 hours to afford aircrew members opportunities to recover from the cumulative affects of fatigue caused by flying on several consecutive days or due to transiting several time zones. If practical, make the en route ground time 36 hours (maximum) after three consecutive near maximum FDPs.

3.10.4. Crew Enhancement Crew Rest (CECR). CECR is not an alternative to a safety-of-flight delay but provides PICs a means to minimize the adverse effects of a crew alert and report period outside normal duty time. CECR periods should be of minimum duration and are normally used during de-positioning legs. Tasking authorities shall approve PIC requests to delay alert time to normalize the work-rest cycle or increase messing options when mission allows. When requests are disapproved, the C2 agent will inform the PIC of the reason for disapproval.

3.10.5. Post-Mission Crew Rest (PMCR). SQ/CCs shall give aircrew members returning to home base sufficient time to recover from cumulative effects of the mission and tend to personal needs. PMCR begins upon mission termination. (N/A to AFRC, ANG and AETC).

3.10.5.1. For missions that kept an aircrew off station 16 hours or more, the SQ/CC shall provide 1 hour (up to 96 hours) PMCR for each 3 hours off-station. Do not enter aircrew members in pre-departure crew rest until the PMCR period expires.

3.10.5.2. PMCR is not applicable to continuing missions and MAJCOM/A3/DO may suspend PMCR during contingency operations.

3.10.5.3. OG/CCs (or equivalents) are PMCR waiver authority.

3.10.6. Flying Crew Chief (FCC) Work/Rest Plan. While on Temporary Duty (TDY), the deployed FCC or MEP maintenance technician shall report to the PIC. The PIC is the final authority on FCC's work/rest schedule. See AFI 21-101, *Aerospace Equipment Maintenance Management*, for detailed guidance.

3.10.6.1. Upon arrival at en route locations the PIC will determine how long the FCC can safely perform aircraft maintenance duties on assigned aircraft. PIC will ensure the FCC has coordinated with en route maintenance supervision prior to entering crew rest with the crew.

3.10.6.2. During extended ground times (non-stage operations) the PIC should coordinate with en route maintenance supervision to determine FCC duty requirements for assigned aircraft.

3.10.7. The lead USAF component will publish MAJCOM/A3/DO-approved crew rest waivers in the Exercise or Contingency OPORD, OPLAN or Concept of Operations (CONOPs).

3.10.8. The Prime Knight program streamlines the process of getting aircrews from aircraft parking ramp into lodging/crew rest. It is only successful when billeting agents receive accurate aircrew/mission information in a timely manner.

3.10.8.1. C2 Agent Responsibilities. A MAJCOM C2 agent will forward information on the departing aircrew's orders to a POC for the next crew rest location's Prime Knight function.

3.10.8.2. PIC Responsibilities. If departing from a location with a C2 agency, ensure a C2 agent has accurate aircrew/mission information to forward to the next Prime Knight POC. If departing from a facility without a C2 agency, the PIC will call the next crew rest location Prime Knight POC to pass aircrew/mission information.

3.10.8.3. SQ/CC or designated authenticating official shall ensure TDY/Flight orders clearly indicate the unit fund cite so that the PIC may make Prime Knight reservations in advance. Without a unit fund cite on the TDY/Flight orders, the PIC must make advance reservations using a government travel card to participate in the Prime Knight program.

3.11. Alerting Procedures. MAJCOM C2 agents shall establish a legal for alert time with the PIC and when appropriate, the Medical Crew Director (MCD) of Aeromedical Evacuation (AE) crews. Whenever possible, C2 agents will inform PICs and MCDs of aircraft status, expected patient up load time, and other pertinent mission details that will streamline mission launch.

3.11.1. Aircrew alert time is normally 3+15 hours before scheduled takeoff time (allows 1 hour for reporting and 2+15 hours for mission preparation). Individual locations may increase or decrease this time depending on specific capabilities. OG/CCs may establish self-alert procedures for training missions.

3.11.1.1. For missions with more than minimum ground time, the PIC may arrange an alert time that provides additional preparation time to accomplish the mission. The PIC may also accept alerting with reduced preparation time when the mission allows. In all cases, the PIC shall coordinate changes to standard alerting times with the appropriate C2 agency.

3.11.1.2. With PIC agreement and when cargo load warrants (i.e. outsized and T.O. 1C-130-9 Chapter 6 cargo), C2 agents may alert loadmasters up to 2 hours before normal alert time. When early alerting is warranted, the PIC and C2 agent must notify the loadmaster before he/she enters crew rest. Do not alert the loadmaster more than 1 hour before beginning cargo up load. Base the aircrew FDP on the loadmaster's show time.

3.11.1.3. C2 agents shall not alert an aircrew until the aircraft is in commission or there is reasonable assurance that maintenance technicians will complete repairs that allow the aircrew time to pre-flight and load the aircraft to meet the target takeoff time.

3.11.1.4. C2 agents shall not alert outbound crews when inbound aircraft is on A-2 or A-3 status until maintenance technicians determine required parts are available and the aircraft will be repaired within the target ground time.

3.11.1.5. Self-Alerts. Crews will self-alert at locations without a C2 agency, but must coordinate with controlling C2 agency. The PIC may elect to self-alert on operational missions at locations with a C2 agency. Coordinate the alert time with local C2 agents to avoid FDP limitations that result from unexpected changes in the mission.

3.11.2. The aircrew release policy is as follows:

3.11.2.1. On the aircrew's initial entry or re-entry into crew rest, the controlling C2 agent, or PIC during self-alerts, will establish an expected alert time.

3.11.2.2. For all missions, the latest allowable alert time is 6 hours after the expected alert time. The PIC may extend that window to 8 hours when flying as primary crew or 12 hours when flying in deadhead status. The controlling C2 agent will not ask the PIC to accept more than the 6 hour window. ANG/AFRC aircrew members may extend the window as necessary to deadhead to home station to meet the Firm Scheduled Return Time (FSRT).

3.11.2.3. When a C2 agent determines circumstances will not allow for aircrew alerting during the legal for alert window, at that time but not earlier than the expected alert time, the C2 agent will contact the PIC and establish a new expected alert time at least 12 hours from the time of notification.

3.11.2.4. If the mission cannot depart within 4+00 hours of any scheduled takeoff, the PIC may continue the mission after a thorough re-evaluation of all ORM factors. The controlling C2 agent will not ask the PIC to accept a takeoff outside of the 4 hour window. The PIC will coordinate with C2 to continue the mission or enter crew rest and establish a legal for alert time.

3.12. Stage Management.

3.12.1. Stage Posture. Stages operate on a positive launch principle. C2 agents shall alert aircrews using the following priority/hierarchy:

3.12.1.1. Aircrews that require an emergency return to home station.

3.12.1.2. De-positioning stage crews will be prioritized by their FSRTs.

3.12.1.3. Aircrews in sequence of arrival time.

3.12.1.4. If the stage manager returns an aircrew in the stage to crew rest because of a mission delay or abort, that aircrew becomes first out when legal for alert.

3.12.2. Mechanical Stage. A C2 agent may create a mechanical stage when a delayed or aborted mission will not resume before that aircrew's FDP expires. Aircrews in a mechanical stage will be first out when a mission in the same direction transits their location while they are legal for alert. A C2 agent may bump an inbound aircrew with FDP to complete that mission to cycle aircrews in a mechanical stage. C2 agents should not normally establish a mechanical stage for ANG and AFRC crews flying unit-equipped aircraft.

3.13. Standby Force Duty. MAJCOM C2 Agents shall task units for Standby Force Duty not later than 18 hours prior to legal for alert time. This allows 6 hours for aircraft pre-flight duty prior to crewmembers entering 12 hours of pre-standby crew rest. If MAJCOM C2 agents are unable to provide 18 hours prior notification, SQ/CC shall place the pre-standby crew in 12-hour crew rest and follow aircraft generation procedures in paragraph **3.7.5** to prepare the aircraft for launch. SQ/CC may keep an aircrew in ALFA/BRAVO status up to 48 hours. MAJCOM/A3/DO may extend this period for contingencies. After 48 hours, launch, release, or re-enter aircrew into 12 hour pre-departure crew rest. OG/CCs may provide additional local procedures for management of Standby Force Duties.

3.13.1. ALFA Standby Aircraft Preflight Generation and Security. When tasked, SQ/CC shall posture an aircraft and aircrew as an ALFA Standby Force able to launch within 1 hour. The following procedures apply to primary aircraft as well as spare aircraft generated for

ALFA alerts. A maintenance Dash -6 and aircrew Dash -1 preflight must be completed. Preflight validity will be in accordance with applicable T.O. After the preflight, the PIC will notify the controlling agency. The aircraft will remain in a sealed posture and be referred to as "cocked on alert". Documentation of when the aircraft was cocked on alert must be placed in the forms. The PIC will ensure the aircraft is secure before entering crew rest. Secure all hatches and doors to show unauthorized entry. Close and lock the crew entrance door with the lock box or other controllable device, which will prevent entry without damage to the door or lock. The aircrew preflight portion remains valid if performed by one crew, cocked on alert, and launched by another crew. Uncocking a generated aircraft is not a standard procedure but may be accomplished on a case by case basis. The PIC or a designated aircrew representative must be present if access to the aircraft is required. Ensure command and control and the controlling agency are notified when uncocking and recocking generated aircraft. Pre-flights done during normal waking hours do not interrupt crew rest. Begin CDT/FDP when C2 agent directs the aircrew to launch from crew rest or while performing pre-flight (begin CDT/FDP when the aircrew arrived at the aircraft to do the pre-flight).

3.13.2. BRAVO Standby Force. When tasked, SQ/CC shall posture an aircraft and/or aircrew in BRAVO Standby Force to permit launch within 3 hours. Pre-flights, if required, interrupt crew rest. Begin CDT/FDP when aircrew shows for duty.

3.13.3. CHARLIE Standby Force. When tasked, SQ/CC shall posture aircrews as a CHARLIE Standby Force ready to enter crew rest within 2 hours. Tasked aircrews will be legal for alert 12 hours after entering crew rest. SQ/CC may keep aircrews in CHARLIE status up to 72 hours. After 72 hours, release aircrews from CHARLIE Standby or enter them into 12 hours crew rest for directed mission, training mission, or subsequent standby force duty.

3.13.4. Wing Standby Force. OG/CC may place aircrews in Wing Standby status. After a 12 hour pre-departure crew rest period, aircrews are legal for alert for 12 hours and must be able to launch within 3+15 hours. After 12 hours, launch, release, or re-enter aircrews in 12 hour crew rest period before subsequent 12 hours Wing Standby duty.

3.13.5. Post-Standby Missions. On completion of standby duty, aircrew members may be dispatched on a mission. If started, post-standby crew rest must be completed before the start of pre-departure crew rest. If an aircrew member is dispatched on a mission, compute the post-mission crew rest time on standby time plus mission time.

3.13.6. Post Standby Crew Rest. Aircrew members not dispatched on a mission following standby duty will receive post-mission standby crew rest as follows:

3.13.6.1. If standby duty is performed away from normal quarters, crew rest time is computed from this standby time on the same basis as for mission time.

3.13.6.2. If standby duty was performed in normal quarters, no crew rest time is authorized.

3.14. Orientation Flights and Incentive Flights. Refer to DOD 4515.13-R, *Air Transportation*, AFI 11-401, and the appropriate MAJCOM supplement.

3.15. Interfly. Interfly is a temporary arrangement between OG/CCs or equivalent to permit the exchange or substitution of aircrew members and/or aircraft between mobility units to accomplish flying missions. Normally, interfly should be limited to specific operations, exercises, or special circumstances. However, it may be used for events of longer duration such as unit conversion to another model design series (MDS). Participating aircrews shall use guidelines established by the lead command or as specified in the OPLAN or CONOPS. ***EXCEPTION:*** AE crewmembers are exempt from interfly requirements. Conduct interfly operations as follows:

3.15.1. Aircrew members shall be current and qualified in the Mission Design Series (MDS) (aircraft and model), as well as unique systems or configuration required to fly the aircraft/mission.

3.15.2. Aircrew members will follow operational procedures established by the lead command for the MDS. The MC or PIC will brief MAJCOM-specific items.

3.15.3. Each affected group commander who commits resources (personnel or aircraft) must concur with interfly proposal.

3.15.4. MDS conversion training.

3.15.4.1. Units may request interfly agreement for duration of their conversion. OG/CCs will forward interfly requests to individual OG/CCs for approval. Requests will include as a minimum a list of affected units, duration of agreement and purpose.

3.16. Additional Crewmembers (ACM). Crewmembers qualified in mobility aircraft are authorized ACM status on any mobility aircraft to pre/de-position in support of mobility operations. MAJCOM designated crewmembers who are assigned or authorized to accompany the normal crew compliment are allowed ACM status.

3.16.1. Crewmembers in ACM status are not authorized to:

3.16.1.1. Displace manifested passengers.

3.16.1.2. Maintain currency and/or log flying time.

3.16.1.3. Use for transportation while on leave. ***EXCEPTION:*** ANG/AFRC Air Technicians may be in a civilian leave status while traveling en route to perform in a military duty status.

3.16.1.4. Travel on Special Air Missions/Command Support Mission (SAM/CSM) aircraft unless authorized by HQ AF/CVAM through the PIC.

3.16.1.5. Travel on SAAMs when specifically restricted by the mission directive.

3.16.1.6. Travel on Operational Support Airlift (OSA) aircraft unless authorized by JOSAC through the PIC.

3.16.2. All ACMs require valid travel/flight orders or supporting message authorizing ACM status. OG/CCs may authorize ACM status for their mobility aircrews.

3.16.3. Flight evaluators have priority and will not be displaced by any other ACM. The priority for evaluators is MAJCOM, NAF, group, and then squadron level.

3.16.4. ACMs normally travel in the crew compartment. If the number of ACMs desiring travel exceeds the capacity of the crew compartment, the C2 agency will notify the Air Terminal Operations Center (ATOC), who in turn will coordinate with the passenger terminal; seats not previously assigned may be used for ACMs.

3.16.5. The PIC or designated representative will brief ACMs on seat assignment, appropriate mission information, emergency procedures including egress, and armed crewmembers. The PIC may assign an ACM aircrew-related duties for which the ACM is qualified.

3.16.6. ACMs will coordinate their travel with the appropriate C2 agency prior to travel. They will process through the C2 agency as early as possible but NLT 3 hours prior to planned block time.

3.17. MEP. Procedures and policies regarding MEP are contained in AFI 11-401 and for AMC aircraft, AMCI 11-208. PICs will ensure personnel traveling in this status are properly authorized.

3.18. Mission Mobility Observers (MMO). MAJCOM supplements or additional directives may establish programs authorizing senior military and civilian personnel to fly for mobility mission familiarization. For AMC MMO information reference AMCI 11-208.

Chapter 4

AIRCRAFT OPERATING RESTRICTIONS

4.1. Objective. Redundant systems may allow crews to safely perform some missions when a component/system is degraded. The PIC is the final authority in determining the overall suitability of an aircraft for the mission. The PIC will ensure a detailed explanation of the discrepancy is entered in the AFTO Form 781A, **Maintenance Discrepancy and Work Document**; include the following maintenance identifiers to effectively communicate aircraft status:

4.1.1. Mission Essential (ME). The PIC will designate an item, system, or subsystem component essential for safe aircraft operation or mission completion as ME.

4.1.2. Mission Contributing (MC). The PIC will designate an item, system, or subsystem component, which is not currently essential for safe aircraft operation as MC. These discrepancies should be cleared at the earliest opportunity. If circumstances change or mission safety would be compromised, re-designate as ME. Do not delay a mission to clear a MC discrepancy.

4.1.3. Open Item (OI). The PIC will designate discrepancies not expected to adversely impact the current mission or any subsequent mission as an OI. These items are normally cleared at home station.

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

4.2.1. The PIC shall account for the possibility of additional failures during continued operation with inoperative systems or components. The MEL is not intended for continued operation over an indefinite period with systems/subsystems inoperative.

4.2.2. All emergency equipment will be installed unless specifically exempted by mission requirements/directives.

4.2.3. Waiver Policy. A PIC prepared to operate with a degraded MEL item shall request a waiver through C2 channels. The PIC shall provide the C2 agent: 1) nature of request, 2) individual crew member qualification, 3) mission leg(s) requiring the waiver, and 4) the governing directive of waiver request to include volume, chapter, and paragraph. Initiate waiver requests as soon as possible; plan at least a 1-hour waiver process time.

4.2.4. PICs operating with waiver(s) for degraded equipment shall coordinate mission requirements (i.e., revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency and/or flight managers.

4.2.5. If beyond C2 communication capability, or when it is necessary to protect the crew or aircraft from a situation not covered by this chapter and immediate action is required, the PIC

may deviate according to **paragraph 1.4**. Report deviations (without waiver) through channels to MAJCOM/A3/DO within 48-hours. OG/CCs shall collect background information and submit a follow-up written report upon request.

4.3. Waiver Protocol. Waivers to operate with degraded equipment are granted on a case-by-case basis. The PIC determines the need for a waiver after coordinating with the lowest practical level of command. MEL waiver authority is as follows:

4.3.1. Training Missions. OG/CC or equivalent with mission execution authority.

4.3.2. MAJCOM Directed Missions. MAJCOM/A3/DO with mission execution authority for active duty, AFRC, or ANG units flying MAJCOM-directed missions (includes Operational Readiness Inspections). Initiate the request with MAJCOM C2 agency. For AMC-directed missions contact HQ AMC/A3V through 618 TACC.

4.3.3. Contingency Missions. DIRMOBFOR (or equivalent) for the agency with C2, if not specified in the OPORD/Tasking Order.

4.3.4. ANG or AFRC Directed Missions. ANG or AFRC maintains C2 and waiver authority for ANG or AFRC directed mission prior to mobilization.

4.3.5. Other Than MEL Waivers. Determine governing source document (i.e. AFI, Flight Manual, Maintenance T.O., etc.) to ascertain the waiver authority. Use C2 channels to notify the appropriate waiver authority. Waivers of this nature may require an extended response time.

4.4. Technical Assistance. The PIC may request technical support and additional assistance from their home unit or MAJCOM C2 agency.

4.5. MEL Table Definitions/Column Identifiers. MEL tables are arranged by aircraft system to provide the PIC a mechanism to determine minimum system requirements. Components are listed by number installed and minimum required for flight. Requirements are defined by Home Station Departure/Main Operating Base (MOB) (Column A) and en route (Column B). Deployed aircraft will use column B. An asterisk (*) in the Required column indicates the number required and is situation dependent; refer to the Remarks/Limitations/ Exceptions column for clarification. Aircraft commanders will determine if the asterisk (*) applies. Lead command/MAJCOMs will designate MOBs as required. AMC and AMC gained aircrews will consider Pope AFB, Little Rock AFB and Dyess AFB as MOBs. Aircrews transiting a MOB on the retrograde portion of a mission may treat a MOB as an en route location. For example, a Little Rock AFB C-130 transiting Pope AFB en route to Lajes AB will use Column A. However, when transiting Pope AFB en route to Little Rock (de-positioning) use Column B. ***NOTE:*** Column B requirements will not normally be waived when transiting a MOB on a de-positioning leg. Local training missions, to include off-station trainers and JA/ATTs, fall under Column B.

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

4.5.1.1. One-time Flight Clarification: Normally a Red X discrepancy is downgraded for a one-time flight. This condition does not preclude carrying cargo and passengers. The priority is to move the airplane to a repair capable facility. PICs must coordinate with

appropriate agencies to ensure repair capability exists at the destination. One-time flights may include en route stops only when necessary to recover the airplane. ***Example***: An airplane departs on a gear-down flight from Djibouti IAP and requires an en-route fuel stop (Cairo) before landing at the nearest repair capable facility, Sigonella NAS.

4.5.1.1.1. One-time flight to nearest repair capable facility: Flight is limited to the nearest (shortest en route time) repair capable base.

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

4.5.1.2. Other Mission and Repair Clarifications:

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

4.5.1.2.2. Mission dictates requirement: PIC shall consider the entire mission profile, not just the next leg. ***Example:*** An airplane is departing an en route station with repair capability, after engine start the FE discovers the #1 engine anti-ice is inoperative. Icing conditions are not forecasted for the next leg. However, because the mission spans several days and repair capability does not exist at the scheduled en route stops, the PIC elects to have the item repaired prior to departing.

4.6. C-130 MEL. This MEL applies to all C-130 models and lists the minimum equipment and systems to launch the aircraft under routine operations. The MEL does not include all equipment or systems essential to airworthiness. The MEL is not intended to promote continued operation of the aircraft for an indefinite period with systems/subsystems inoperative. Due to the various configurations of C-130s, the number in the "Installed" column is a representation of the majority of the aircraft. If your series requirement is different than the number shown, there is no waiver requirement for the number installed.

Table 4.1. Engines/Auxiliary Power Unit (APU)/Gas turbine Compressor (GTC).

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Engines	4	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 will achieve takeoff power settings.
Torquemeter	4	4	4	
Tachometer	4	4	4	
Turbine Inlet Temperature Indicators	4	4	4	
Fuel Flow Gauges	4	4	4	

Oil Temperature Gauges	4	4	4	
Oil Pressure gauges	4	4	4	Indicators for both the engine power section and reduction gear section must be operational.
Oil Quantity Gauges	4	3*	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	1	0*	*If inoperative, all four oil quantity gauges must be operational.
Oil Cooler Flap	4	0*	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	4	0*	Oil Cooler Flap Position Indicator may be inoperative provided oil temperature can be maintained within normal operating limits.
APU	1	1	0*	*If the APU fails, flight in VMC is authorized provided no other electrical malfunctions exist. If the APU generator is inoperative, the generator will be removed and padded prior to operation of the APU.
GTC	1	1	0*	*Mission dictates requirement.

Table 4.2. Propellers.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Propeller	4	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	0*	*Shall be repaired at next repair capable facility, provided no other portion of the propeller system is affected. Synchophaser will be removed.

Table 4.3. Electrical System.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**

Generators, Engine-Driven	4	4	3*	*Shall be repaired at next repair capable facility. If the AC generator is not equipped with a generator disconnect, it will be removed and the generator mount padded before flight. Local training missions may continue after a generator is disconnected or removed and the mount padded, provided no other electrical malfunction exists.
Bus Switching Unit (BSU)	2	2	1*	*The #1 BSU must be operational.
Transformer Rectifiers (TR)	4	4	3*	*One Essential TR unit may be inoperative for one-time flight to a repair capable facility provided no other electrical malfunction exists.
LAIRCM system fifth Transformer Rectifier (TR)	1	0*	0*	*Theater specific SPINS dictate requirements.
ATM and ATM generator/APU Generator	1	1	0*	*If the ATM, ATM generator/APU generator fails, flight in VMC is authorized provided no other electrical malfunctions exist. APU generator will be removed and padded before operation of the APU.
Generator Out Lights	4	4	4*	*If a generator has been disconnected or removed and padded, its associated indicators do not have to be operational. All associated equipment and indicators will be operational for each operative engine-driven generator (i.e., generator control panel, GCU, voltage regulator, generator out/caution light, AC loadmeter, etc.).
AC Loadmeter	4	4	4*	*If a generator has been disconnected or removed and padded, its associated indicators do not have to be operational. All associated equipment and indicators will be operational for each operative engine-driven generator (i.e., generator control panel, GCU, voltage regulator, generator out/caution light, AC loadmeter, etc.).

Table 4.4. Anti-Ice/De-Ice System.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Ice Detection System	1	1	0*	*Mission dictates requirement. Will be operational for flight into known or forecast icing conditions.

Pitot-Heat System	2	2	2	
TAS Probe Heat	1	1	1	
Wing/Empennage Anti-Icing System	2	2	0*	*Mission dictates requirement. Will be operational for flight into known or forecast icing conditions.
Engine Inlet Air Duct Anti-Icing Systems	4	4	0*	*Mission dictates requirement. Will be operational for flight into known or forecast icing conditions.
Leading Edge Temperature Indicators	6	6	6	
Wing Leading Edge and Wheel Well Overtemperature Warning Lights	7	7	7	
Propeller Anti-Icing and Deicing Systems	4	4	0*	*Mission dictates requirement. Propeller Blade De-Icing will be operational for flight into known or forecast icing conditions.
Windshield Anti-Icing Systems	2	2	0*	*Mission dictates requirement. Will be operational for flight into known or forecast icing conditions.
Radome Anti-icing System (AWADS)	1	1	0*	*Mission dictates requirement. May be inoperative for flights that do not require radar.

Table 4.5. Air Conditioning, Pressurization and Bleed Air.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Flight Deck and Cargo Compartment Air Conditioning Units	2	2	0*	Pressurization and both air conditioning systems should be operational for special weapons missions. *Repair as soon as practical. Ensure that an acceptable pressure and temperature can be maintained with operable systems. Coordinate with the senior medical AECM when patients are carried. Passengers and patients will be briefed on the possibility that discomfort may be encountered. *Air conditioning and pressurization are not required for low-level missions if a reasonable temperature can be maintained.
Flight Deck Auxiliary Vent Valve	1	1	1	
Cargo Compartment Auxiliary Vent Valve	1	1	0	

Flight Deck/Cargo Compartment Temperature Control System	2	2*	2*	*Automatic or manual system may be inoperative if the other is operable.
Under Floor Heat System	1	1	0*	*Mission dictates requirement.
Cabin Pressure Controller	1	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	1*	*May be inoperative for unpressurized flight.
Cabin Differential Pressure Indicator	1	1	1*	*May be inoperative for unpressurized flight.
Cabin Rate of Climb Indicator	1	1	1*	*May be inoperative for unpressurized flight.
Emergency De-Pressurization Switch	1	1	1	

Table 4.6. Doors and Ramp Systems.

Item/System	Installed	Required		
		A	B	Remarks/Limitations/Exceptions
Ramp Locking System	1	1	0*	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. *Mission may continue. Unpressurized flight, with no cargo on the ramp, may be performed with a cargo ramp lock malfunction when mission requirements dictate.
Aft Cargo Door Locking System	1	1	0*	*Mission may continue. Pressurized flight may be performed with a aft cargo door lock malfunction when mission requirements dictate.
Crew Entrance Door and Warning Light	1	1	1	

Table 4.7. Hydraulics.

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

Table 4.8. Landing Gear.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Landing Gear System	1	1	1*	*Shall be repaired at next repair capable facility. Gear will not be moved from the down and locked position. If landing gear has been tied down IAW Flight Manual emergency procedures, no further flights are authorized until repair is made or inspected by authorized maintenance personnel. Flight (including enroute stops) with landing gear doors removed may be accomplished to a destination with repair capability.
Landing Gear Position Indicators	3	3	0*	*Shall be repaired at next repair capable facility. Gear will not be moved from the down and locked position.
Landing Gear Warning Light	1	1	0*	*Shall be repaired at next repair capable facility. Gear will not be moved from the down and locked position.

Table 4.9. Brake/Anti Skid Systems.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Wheel Brakes	4	4	4	
Parking Brake	1	1	1	

Anti-Skid	1	1	0*	*Shall be repaired at next repair capable facility. Maximum effort landings with antiskid inoperative are not authorized. A local training flight may continue if the antiskid fails provided the system is turned off. Multiple landings or formation landings should not be accomplished.

Table 4.10. Fuel System.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Main Tank Fuel Pumps	4	4	4*	*On aircraft with dump mast shutoff valve switches, one main tank fuel boost pump may be inoperative for one-time flight to a repair capable facility, provided the respective fuel dump pump is operational.
Main Tank Dump Pumps	4	4	4	
Auxiliary Tank Fuel Pumps (per tank)	1	1	0*	*Mission dictates requirement. Auxiliary tank fuel pumps will be operational for any tank containing fuel.
External Tank Fuel Pumps (per tank)	2	2	0*	*Mission dictates requirement. One pump will be operational for any tank containing fuel.
Main Fuel Quantity Indicators (See NOTE 1)	4	4	3*/ 2**	*One main fuel tank indicator may be inoperative provided: Both the tank with the inoperative indicator and its symmetrical 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. At enroute stops when engines are shut down, the tank with the inoperative indicator and the symmetrically opposite tank will be dip checked. Crossfeed operation will begin when the symmetrically opposite quantity indicator has decreased to 1,500 lbs (inboards) and 2,500 lbs (outboards). Engine out training using the engine corresponding to the inoperative indicator or its symmetrical opposite will not be conducted during tank to engine operation.

				Flights consisting of multiple stops when the mission profile does not allow dipping of tanks (i.e., EROs, local trainers) will terminate with a minimum of 8,000 lbs calculated main tank fuel. **Local training flights may be conducted with two inoperative main tank indicators provided: Inoperative indicators are asymmetrical. Main tanks fuel quantity is visually verified using the fuel tank dip stick. The fuel tank dip stick is calibrated for JP-4. Use with other fuels is inaccurate for reading pounds of fuel quantity. Engine out training is not performed unless all engines are on crossfeed from auxiliary or external tanks with operative indicators. Symmetrical engine fuel flow is maintained. Mission will terminate with a minimum of 8,000 lbs calculated main tank fuel.
External Fuel quantity Indicator (See NOTE 1)	2	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: Check pressure with each pump in the external tank. If no pressure is obtained, the tank is verified empty. If pressure is obtained, ground transfer the fuel from the external tank. Defuel the external tank if unable to ground transfer. When unable to verify an external tank is empty prior to engine start, the tank will be placed on crossfeed until no pressure is obtained. This will be completed prior to takeoff. **EXCEPTION:** LC-130s conducting

				Antarctic Operations may operate with partial fuel loads in the external fuel tanks with one external fuel quantity indicator in-op provided both tanks are dipped and all main tank fuel quantity indicators are operational.
Auxiliary Tank Fuel Quantity Indicators	2	2	0*	*If fuel quantity indicator is inoperative, fuel quantity will be verified with the magnetic sight gauge.

NOTE 1: 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 4.11. Flight Recorder/Locating Systems.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Flight Data Recorder (FDR)	1	1	0*	*If the FDR is inop but the CVR is operational, flight is authorized to next repair capable base.
Cockpit Voice Recorder (CVR)	1	1	0*	*If the CVR is inop but the FDR is operational, flight is authorized to next repair capable base.
Emergency Locator Transmitter	1	1	0*	*Shall be repaired at the next repair capable facility.
Underwater Acoustical Locator Beacon (UAB)	1	1	1	

Table 4.12. Fire Protection/Warning Systems.

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

Table 4.13. Flight Instruments.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Airspeed Indicator	2	2	2	
Vertical Velocity Indicator or Vertical Velocity Speed Indicator	2	2	1*	*NVG airland missions and flights in RVSM airspace require 2.
Flight Director Systems	2	2	2	

Attitude Director Indicator (ADI)	2	2	2*	*One turn needle may be inoperative provided no other malfunctions exist on either ADI. (On airplanes prior to AF78-0806, modified by TO 1C-130-1391 and TO 1C-130-1333.)
Standby ADI (if installed)	1	1	1	
Horizontal Situation Indicators	2	2	2	
EFI Displays (if installed)	4	4	3*	*Inoperative EFI must be in the copilot HSI position.
BDHI	4	3	0	
Barometric Altimeters	3	3	2*	*Both pilots' altimeters must be operational.
CARA (pilot's indicator)	1	1	0*	*Mission dictates requirement. Required for NVG operations.
Ground Proximity Warning System (GPWS) (if equipped)	1	1	0*	*Shall be repaired at the next repair capable facility.
Ground Collision Avoidance System (GCAS) (if equipped)	1	1	0*	* Shall be repaired at the next repair capable facility.
*Traffic Alert and Collision Avoidance System (TCAS) (if equipped)	1	1	0*	* Shall be repaired at the next repair capable facility.
Digital/Central Air Data Computer (if installed)	1	1	1	
#1 UHF Manual Control Head Radio (SCNS only)	1	1	1	
HF Radio	2	1	0*	* One required for overwater flight.

Table 4.14. Navigation Systems.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Standby Magnetic Compass	1	1	1	
Heading Systems	2	2	1*	*See para. 4.8.
VOR/ILS	2	2	1	
NDB	2	2	1	
TACAN	2	2	1	

Radar	1	1	0*	*Mission dictates requirement. Will be operational if thunderstorms or hazardous conditions that can be detected by airborne radar are forecast or exist along route of flight. Required for NVG airland/assault ops.
*241 Radar	1	1	0*	*Mission dictates requirement. When no navigator is on board, the pilot's display/sweep is required for flight if thunderstorms are known or forecast along the route of flight. When a navigator is on board, the navigator's display is required for NVG airland, maximum effort operations, or when thunderstorms are known or forecast along the route of flight.
IFF/SIF	1	1	1	Aircraft will not depart with an IFF known to be inoperative. If self test fails, you may take off if the IFF was operational on the previous mission. ***EXCEPTIONS:*** Formations must have at least one operational IFF per element.

Table 4.15. Aircraft Exterior/Interior Lighting.

Item/System	Installed	Required		
		A	B	**Remarks/Limitations/Exceptions**
Landing Lights	2	2	1*	*One may be inoperative provided the taxi light on same side is operational.
Taxi Lights (H-3 With 4 Installed)	2 4	2 4	1* 2*	*One may be inoperative provided the landing light on the same side is operational. * Two on same side may be inoperative provided landing light on same side is operational
Formation Lights	9	0*	0*	Mission dictates requirement. Two lights per wing will be operational for night formation flights.
Navigation Lights	6	6	3*	*For night operations, the left and right wingtip Navigation lights must be operational in addition to one of the white lights on the tail cone.
Anti-Collision/Strobe Lights	2	2	1*	*Shall be repaired at next repair capable facility.
Wing Leading Edge Lights	2	2	0	

Primary Instrument Cockpit Lighting	1	1	0*	*Mission dictates requirement. 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.

4.7. Supplements. Each MAJCOM may supplement the MEL (see **Chapter 1**).

4.8. Navigation Systems.

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

4.8.1.1. SCNS aircraft. Fully operational SCNS, to include the navigator's IDCU and either the pilot or copilot's IDCU.

4.8.1.2. 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.

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

4.8.3. 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.

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

4.9.1. Standard climb-out flight path charts in T.O. 1C-130-1-1 do not account for a gear-down configuration. Therefore, PICs shall not takeoff until there is reasonable assurance that they will achieve/maintain adequate obstacle clearance (to include en route stops and alternates).

4.9.2. Time and communications capability permitting, validate takeoff data with MAJCOM Stan/Eval or OG/OGV.

4.10. Minimum Equipment for NVG Operations. The following equipment is required for NVG operations (in addition to the equipment listed above):

4.10.1. Pilot's Radar Altimeter.

4.10.2. Navigator's Radar (NVG airland/assault only) . Must be operational for initial takeoff. If the radar fails en route, PIC will determine whether or not to continue mission based on ORM assessment.

4.10.3. SCNS with integrated GPS and a minimum of one INS must be operational for low-level flights flown using NVG en route altitudes.

4.10.3.1. If any of the components listed in **4.10.3** are inop or fail en route, conduct operations no lower than minimum safe altitude (MSA). ***EXCEPTION:*** Wingmen may fly in-trail at NVG en-route altitudes as long as all components in **paragraph 4.10.3** are operational in the lead aircraft.

Chapter 5

OPERATIONAL PROCEDURES

5.1. Checklists. A checklist is not complete until all items have been accomplished. 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). Currency of notes is a crewmember's responsibility.

5.1.1. Checklist Inserts. MAJCOM/A3V and the MDS flight manual manager shall approve the use of checklist inserts IAW AFI 11-215. For AMC and AMC-gained units, HQ AMC/A3V is the checklist insert approval authority. The inserts should be placed at the end of the appropriate checklist or in an in-flight guide. All checklist inserts must have a POC. OGVs shall approve local in-flight guides and inserts not affecting T.O. guidance and procedures.

5.1.2. Abbreviated checklists 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. Both pilots shall be in their seats during flight. One of the pilots may be out of their seat for brief periods to meet physiological needs. With both pilots in their seats, PICs may authorize rest periods for one pilot occupying a primary duty station during non-critical phases of flight (the other pilot will be awake and alert). Only one pilot, or the flight engineer, may be absent from their duty station at a time. Notify the PIC prior to departing assigned primary duty station.

5.3. Flight Station Entry. PICs may authorize passengers and observers access to the flight station during all phases of flight. The total number of persons permitted is limited to the number of seats with operable seat belts and a sufficient oxygen source. Passengers and observers will not be permitted access to primary crew positions.

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

5.4.1. An AC or IP will make all takeoffs and landings during:

5.4.1.1. Airlift of nuclear weapons.

5.4.1.2. Aircraft emergencies, unless conditions prevent compliance. ***EXCEPTION:*** Mobility Pilot Development (MPD) trained pilots may perform takeoffs and landings during aircraft emergencies.

5.4.1.3. Tactical/Max effort operations or landings with substandard airfield operations.

5.4.1.4. DELETED

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

5.4.2. Unless the pilot in the other seat is a certified AC or higher, Pilots In Command (PIC) with less than 100 hours Primary Assigned Hours (PAH) hours since AC certification will make all takeoffs and landings under any of the following conditions:

5.4.2.1. Ceiling/visibility less than 300 feet and/or RVR 40 (3/4 SM visibility).

5.4.2.2. RCR less than 12.

5.4.2.3. Crosswind component greater than 15 knots.

5.4.3. Copilot/MPD Takeoff/Landing Policy:

5.4.3.1. INSTM/QUAL. MPD trained pilots may takeoff or land from either seat if an AC occupies the other seat. Copilots may takeoff and land from the left seat only if an IP provides direct supervision from the right seat.

5.4.3.2. MSN. Copilots/MPDs will not takeoff or land from the right seat when in formation. Copilots/MPDs in Mission Upgrade may occupy the left seat on formation departures/ recoveries and assault or substandard airfield operations with an IP in the right seat.

5.4.4. DELETED

5.5. Landing Gear and Flap Operating Policy. The pilot flying (PF) the aircraft will command configuration changes. The pilot monitoring (PM) the aircraft will verify appropriate limitations and acknowledge the command by repeating it. The landing gear will be operated by the pilot in the right seat. The flaps will be operated by the pilot monitoring.

5.6. Outside Observer/ACM Duties. Available crewmembers will assist in clearing during taxi operations, and any time the aircraft is below 10,000 feet MSL.

5.7. Seat Belts.

5.7.1. All occupants will have a designated seat with a seat belt. Loadmasters (or other crewmembers) required to be in the paratroop door at the scanning position will have a designated seat (other than the scanning seat) with a seat belt.

5.7.2. Crewmembers will have seat belts fastened when occupying a duty position, unless crew duties dictate otherwise.

5.7.3. All crewmembers will have seat belts fastened during takeoff and landing unless crew duties dictate otherwise. Fasten shoulder harness unless crew duties dictate otherwise. Crewmembers performing instructor or flight examiner duties or are in upgrade training to instructor or flight examiner are exempt from seat belt requirements if not occupying a primary crew position; however, they will have a seat available with an operable seat belt.

5.7.4. Litter patients, actual or simulated, may remain secured on litters for takeoff and landing.

5.7.5. The use of paratroop door seats on newer C-130 aircraft, locally manufactured seats or other commercially manufactured seats obtained for loadmaster comfort while performing threat scanning are only authorized in conjunction with the restraint harness method outlined in paragraph 6.26.5.

5.8. Aircraft Lighting. IAW AFI 11-202V3, AFI 11-218, *Aircraft Operations Movement on the Ground*, and applicable T.O.s.

5.8.1. NVG Lighting. During combat/contingency operations, the tactical situation may dictate the use of all, some, or none of the aircraft exterior lights as determined by the mission commander. Landing lights will be extended and ready for use prior to all landings. The tactical situation will dictate if the landing lights will be used during landing. Lights-out

operations during peacetime will be conducted IAW AFI 11-202V3. Follow the exterior lighting guide in AFTTP 3-3.25 for all NVG training situations.

5.8.1.1. Total lights-out operations are authorized with concurrence of the controlling agency in restricted airspace and warning areas.

5.8.2. Cargo compartment lighting will be dictated by the situation and will be coordinated between the mission commander/PIC and loadmaster(s). During cargo compartment emergencies the loadmaster should discontinue NVG use and select full bright on the cargo compartment lights (situation permitting).

5.8.3. Interior lighting will be set-up using NVIS compatible lighting for all NVG airland operations (C-130E/H and H-2 "harness" filter kit or Glendale Filter system (GFS) are also acceptable). "Taping" with NVG compatible chemical lights is not an acceptable lighting scheme for NVG airland operations. ***WARNING:*** NVGs adjust to the brightest source of light; for that reason, poor cockpit lighting discipline may prevent a successful transition to landing during IMC. Therefore, do not perform an instrument approach in IMC to an NVG landing without NVIS compatible flight deck lighting.

5.8.4. Aircraft Preparation. For NVG en route and airdrop operations, aircrews are allowed to "tape" incompatible lighting and use NVG compatible chemical "glow" sticks. Some techniques for taping are outlined in AFTTP 3-3.25. NVIS compatible lighting (including lighting "harness") is required for all NVG airland operations.

5.8.4.1. Loadmaster Aircraft Preparation. Taping of lights may be accomplished; however, no more than one layer of tape will be used.

5.9. Portable Electronic Devices. IAW AFI 11-202V3.

5.9.1. Do not connect unauthorized equipment (laptop computers, video equipment, food preparation equipment, radios/tape players, CD players, etc.) to the aircraft intercom, PA, radio systems, or electrical system.

5.9.2. Aircrew members shall not use uncertified Government Furnished Equipment (GFE) or personal devices with RF transmit/receive capability on AMC aircraft carrying hazard class 1 explosive cargo at anytime. Prohibited devices include cellular phones and laptop computers/PDAs with wireless capability (i.e. Bluetooth). Loadmasters will ensure passengers comply with this restriction. Aircrew members may use certified GFE such as PFPS laptops, handheld (HH) GPS, and PDAs with infrared transmitters.

5.9.3. Authorized electronic equipment, is listed on the AMC/A3V website at: **https://private.amc.af.mil/a3/a3v/publications.aspx**

5.10. Tobacco Use on Air Force Aircraft. Tobacco use of any type is prohibited on Air Force aircraft.

5.11. Advisory Calls. The PF will periodically announce intentions during departures, arrivals, approaches, and when circumstances require deviating from normal procedures. **Tables 5.1** through **5.4** depict mandatory calls for nonprecision approaches, precision approaches, climbout and descent, respectively.

Table 5.1. Nonprecision Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above Final Approach Fix (FAF) altitude	"100 above"	
100 feet above step down altitude	"100 above"	
100 feet above Minimum Descent Altitude (MDA)	"100 above"	
At MDA	"Minimums"	
Runway environment in sight	"Runway in sight"	
Missed Approach Point (MAP)	"Missed Approach Point"	See note (1)

Table 5.2. Precision Approaches

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above glide slope intercept altitude	"100 above"	
100 feet above Decision Height (DH)	"100 above"	
At DH		
- Runway environment in sight	"Land"	See note (3)
- Approach Lights in sight (CAT 1 ILS)	"Continue" (2)	"Continue" (3)
- Approach lights and/or Runway environment not in sight	"Go-around"	"Go-around"

Table 5.3. Climb Out.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition Altitude	"Transition Altitude"(4)	(4)
1000 below assigned altitude	"1000 Below"	

Table 5.4. Descent.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition Level	"Transition Level"(4)	(4)
1000 above assigned altitude	"1000 Above"	

(1) The PF will announce his/her intentions to either land or go-around. If the runway environment is not in sight and/or the aircraft is not in position for a normal landing, a go around will be made.

(2) With weather at CAT 1 minimums on a CAT 1 ILS, the pilot may not see the runway environment at DH; however, the initial portion of the approach lights will be visible. The pilot may continue to 100 HAT with reference to the approach lights. The pilot may not descend below 100 feet above touchdown zone elevation using the approach lights as reference unless the red terminating bars or the red side row bars are distinctly visible and identifiable.

(3) The PF will announce his/her intentions to either land, continue, or go-around. Respond intention to "Land" if runway environment is in sight, will remain in sight throughout touchdown and the aircraft is in a position for a safe landing.

(4) Both pilots and navigator will state the altimeter setting.

5.11.1. Takeoff. State "GO" at refusal speed or takeoff speed, whichever is lower. Any crewmember 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.").

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

5.11.1.2. Any crewmember seeing a deviation of 200 feet altitude or 10 knots in airspeed, or a potential terrain or obstruction problem, will immediately notify the PF. Deviations from prescribed procedures for the approach being flown will also be announced.

5.11.2. Deviations:

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

5.11.2.2. Any crewmember seeing a deviation of 200 feet altitude or 10 knots in airspeed, or a potential terrain or obstruction problem, will immediately notify the PF. Deviations from prescribed procedures for the approach being flown will also be announced.

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

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

5.12.2. Aircraft Interphone. Primary crewmembers will monitor interphone during critical phases of flight. Crewmembers will advise the PF before checking off interphone. Crewmembers will ensure personnel on headset, or within listening distance are cleared prior to discussing classified information over interphone.

5.12.3. Command Radios:

5.12.3.1. The PM normally makes all ATC radio calls.

5.12.3.2. In terminal areas, all crewmembers (if able) will monitor the command radio unless directed otherwise. A crewmember will be designated to monitor C2 frequencies on the inbound and outbound legs.

5.12.3.3. The pilot operating the radios will notify the crew which radio is primary, and update the crew when the primary radio changes.

5.12.3.4. One pilot should record and will read back all ATC clearances. The navigator or communications systems operator (if applicable) will record the clearance instructions, monitor the read back, and ensure compliance with all instructions.

5.12.3.5. Both pilots will monitor UHF and VHF guard emergency frequencies to the maximum extent possible.

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

5.12.4. Crew Resource Management (CRM) Assertive Statement "Time Out":

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

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

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

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

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

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

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

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

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

5.13. Transportation of Pets. Transporting pets (dogs and cats) in conjunction with the sponsor's permanent change of station is authorized. Other pets or animals are normally prohibited, but may be moved according to DOD 4515.13R.

5.14. Alcoholic Beverages. MAJCOM/A3/DO may authorize the dispensing of alcoholic beverages.

5.15. Runway, Taxiway and Airfield Requirements:

5.15.1. Minimum Runway and Taxiway Requirements. For peace-time do not use runways less than 3,000 feet. Minimum runway width is 80 feet (60 feet for max effort). Minimum taxiway width is 30 feet. The MAJCOM/A3/DO may waive runway/taxiway width requirements.

5.15.2. Runway Length for Takeoff and Landing. Minimum runway length for normal take-off is Critical Field Length or Minimum Field Length for Maximum Effort Take-Off for max effort operations. All speeds and distances will normally be computed "with nosewheel steering" when operating from dry hard surfaced runways. The "without nosewheel steering" option will be used when operating from wet or icy runways. Minimum runway for normal landing is Landing Distance or Ground Roll plus 500 feet for max efforts. For peacetime, compute landing performance with two engines in reverse, and two engines in ground idle.

5.15.2.1. Runway Length for Intersection Takeoffs. Normally, the PF will initiate takeoffs from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the PIC.

5.15.2.2. Pilots may accomplish intersection takeoffs provided the operating environment (i.e., gross weight, obstructions, climb criteria, weather, etc.) allows a safe takeoff and departure. Calculate takeoff performance based on the runway remaining from the point at which the takeoff is initiated.

5.15.2.3. During operations on runways partially covered with snow or ice, base takeoff computations on the reported runway surface condition (RSC) or runway condition reading (RCR) for the cleared portion of the runway. A minimum of 40 feet either side of centerline should be cleared (30 feet for maximum effort operations). If 40 feet either side of centerline is not cleared (30 feet for max effort ops), compute takeoff data based on the uncleared portion.

5.15.2.4. Use of Overruns. If approach end overruns are available and stressed or authorized for normal operations, they may be used to increase the runway available for takeoff. Departure end overruns (if stressed and authorized) may also be used for landing if needed.

5.15.3. Arresting Cables.

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

5.15.3.2. Do not takeoff or land over an approach end cable that has been reported as slack, loose, or improperly rigged by NOTAM, automated terminal information service (ATIS), or ATC.

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

5.15.4. Other Airfield Requirements.

5.15.4.1. Consult with HQ AMC/A36AS (Airfield Suitability Branch) for suitability guidance. Once a mission is executed, the PIC is responsible for determining airfield suitability based upon operational need. Airfield certification requirements are detailed in the ASRR.

5.15.4.2. Aircrews and planning agencies will contact HQ AMC/A36AS for all questions pertaining to airfield weight bearing capability and will review the GDSS/GDSS2/ASRR before all off-station operations. HQ AMC/A3 is the waiver authority for the restrictions in GDSS/GDSS2 Giant Report and ASRR for AMC and AMC-gained aircraft, unless specifically delegated in AFI 11-2MDS Vol 3 or AMCI 11-208. Direct GDSS/GDSS2 Giant Report and ASRR waiver requests to HQ AMC/A36AS. HQ AMC A37V is the OPR for waivers to airfield restrictions. MAJCOM/A3/DO is the waiver authority for non-AMC missions. The PIC is responsible for waiver compliance. Crews that have

access to the World Wide Web will review airfield suitability in the airfield data base via the HQ AMC Aircrew Portal. Consult the ASRR for airfield certification requirements.

5.15.4.3. For other than hard-surfaced runways or taxiways, the airfield must be listed in the ASRR as certified or have a current landing zone (LZ) survey.

5.15.5. RCR Limitations. When no RCR is available, the PIC will refer to the flight manual for standard ICAO conversions based on general runway condition; be conservative when dealing with unknown conditions (e.g., forward operating bases (FOBs), unpaved runways). Normally, RCR values are not reported for taxiways and ramps. During periods of reported low RCR, the taxiways and ramps may have an even lower RCR than reported for the runway. The runway surface should be considered wet when water on the runway causes a reflective glare.

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

Table 5.5. RCR Values.

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

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

5.15.6. Wind Limitations. All maximum effort operations must fall in the "recommended" area of charts (corrected for RCR) unless otherwise approved by OG/CC.

5.15.7. Takeoff Speeds. If Vmeto is used for takeoff, climb until clear of the real or simulated obstacle at max effort obstacle clearance speed. If Vmca is used for takeoff, climb until clear of the real or simulated obstacle at Vmca + 10 knots.

5.15.7.1. If obstacles are a factor, use Vmeto and max effort obstacle clearance speed without Vmca corrections. If unable to clear obstacles using Vmeto and maximum effort obstacle clearance speed, reduce aircraft gross weight or delay mission for more favorable conditions.

5.15.7.2. The PIC will ultimately make the decision to use Vmeto or Vmca based on a consideration of all available data including: weather, runway length, Vmeto, Vr, Vmca, Vmcg, applicable airfield survey, and a review of hazards, obstructions, and terrain both

laterally and along the climb out flight path. Peacetime restrictions: take-off at Vmca or Vmeto, which ever is greater unless obstacles are a factor. ***WARNING:*** Max effort operations at high altitude, gross weight, and temperatures are critical; climb angles as low as 2.5 degrees may prevent the aircraft from accelerating. Any further climb angle increase may result in the loss of airspeed and the onset of a pre-stall buffet.

5.15.8. Anti-icing fluid. AMS 1428, Type II anti-icing fluid is authorized for use in extreme climatic conditions. Due to the shearing properties of Type II anti-icing fluid, it may be necessary to increase takeoff speed. When Type II anti-icing fluid is used, increase takeoff speed to a minimum of 110 KIAS and make necessary distance corrections to performance data.

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

5.16.1. Do not taxi an aircraft within 25 feet of obstructions without wing walkers monitoring the clearance between aircraft and obstructions. With wing walkers, avoid taxi obstructions by at least 10 feet.

EXCEPTION: IAW AFI 11-218, aircraft may taxi without marshallers/wing walkers at home station along fixed taxi lines, which have been measured to ensure a minimum of 10 feet clearance from any obstruction, and the obstruction is permanent. Adjacent aircraft are considered a permanent obstruction provided the aircraft is parked properly in its designated spot and not moving. Aerospace Ground Equipment (AGE) and vehicles are considered a permanent obstruction provided it is parked entirely within a designated area. Areas will be designated by permanent markings such as painted boxes or lines on the ramp or another suitable means.

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

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

5.16.3.1. Carefully review airfield layout, paying particular attention to taxi routes, turn requirements, and areas for potential FOD.

5.16.3.2. Minimize power settings during all taxi operations.

5.16.3.3. Use low speed ground idle whenever possible.

5.16.3.4. Where possible, avoid 180° turns. If it becomes necessary to accomplish a 180° turn on a narrow runway, the turn should be accomplished at an intersection of a link taxiway or at a designated turn around pad.

5.16.3.5. Where possible, avoid taxi operations that position an engine over an unprepared or un-swept surface. If unavoidable, use low speed ground idle on that engine (to the maximum extent possible) until the engine is over an improved surface.

5.16.4. Reverse Taxi: The PIC shall coordinate reverse taxi directions and signals with the loadmaster and marshaler (when available). Before reverse taxiing, the loadmaster shall:

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

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

5.16.4.3. Position himself/herself on the aircraft ramp to direct reverse taxi, report any hazards, and to provide the PIC with timely interphone instructions on turns, distance remaining, conditions of the maneuvering area, and stopping point.

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

5.16.4.5. During night reverse taxi operations without NVGs, the PIC and loadmaster will ensure the taxi area is sufficiently lighted. ***CAUTION:*** Prop Blast during ground operations is capable of causing extensive damage to other aircraft, flight line equipment, and airport facilities.

5.16.4.6. **(Added-934AW)** Backing briefed as "standard" will mean: Both pilots will keep feet flat on the floor during entire procedure, and follow the commands of the loadmaster as appropriate. Should the pilot wish to stop the aircraft at any point during the procedure, he/she will state, "start your count." Loadmaster will be positioned on the aft end of the ramp of the aircraft to get a good visual of the area behind the aircraft, brief the pilot of any applicable obstructions in the immediate vicinity of the aircraft, and state, "cleared to start back." After aircraft movement has begun the loadmaster should state one or more of the following: "come straight back," "turn towards number one/more towards number one," or "turn towards number four/more towards number four." Once aircraft is established in the proper turn, loadmaster should state, "hold that turn," or "continue straight back." When aircraft has backed sufficiently, the loadmaster should state "prepare to stop," followed by a count of "five, four, three, two, one" in order to set cadence for the stop. Upon hearing the count, the pilot will plan on stopping the aircraft at the completion of the count using the throttles. During the backing procedure if no further instructions are immediately necessary and backing is to continue, the loadmaster should state "continue," or "hold that turn" repeatedly. If the pilot fails to hear the loadmaster for more than approximately three seconds, he/she will query the loadmaster. If no response is heard, the pilot will bring the aircraft to a stop. If no further backing is necessary, the pilot should state, "start your count," where upon the loadmaster will begin the five second countdown. Brakes will not be used to stop the aircraft while backing.

5.16.5. After landing and clearing the runway, and with approval of the PIC, the loadmaster may open the aft cargo door and lower the ramp to approximately 12 inches above horizontal to prepare for cargo off/on-load provided equipment, cargo, and passengers remain secure in the cargo compartment.

5.17. Not Used.

5.18. Fuel Jettison Procedures.

5.18.1. AMC policy is to burn down fuel versus jettison, unless safety of flight dictates an immediate jettison (as determined by the PIC). Except in the case of an emergency, before jettisoning fuel, notify the appropriate ATC or flight service facility of intentions, altitude,

and location. If available, the PIC will use designated jettison areas, except when safety of flight would be compromised.

5.18.2. For missions tasked by higher headquarters authority, the tasking C2 agency may authorize fuel jettison when an urgent operational requirement dictates immediate recovery/reconstitution of the aircraft and/or aircrew. The tasking C2 agency may provide fuel jettison instructions in the OPORD, mission directive, SPINS, etc.

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

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

5.18.4.1. **(Added-934AW)** Fuel Dumping Procedures. The aircraft commander will determine the best course of action in an emergency situation. If time and conditions permit, consider using R4301 or R4305 for emergency fuel dumping. Per 934 AWI 13-202, fuel dumping requires the Command Post to be notified of the event. If the emergency situation does not allow prior notification, the Command Post must be notified as soon as the situation safely allows.

5.18.5. All jettisons will be followed up with a detailed report filed by the pilot in command immediately after landing (AMC Forms 97, *AMC In-flight Emergency and Unusual Occurrence Worksheet*). Submit AMC Forms 97 through unit OGV to the MAJCOM with operational control of the mission. Using MAJCOMs will forward the forms to HQ AMC/A3V. Unit OGVs will retain AMC Forms 97 for 6 months. Document all pertinent information, including the following items:

5.18.5.1. Scheduled Duration.

5.18.5.2. Actual Duration.

5.18.5.3. Landing Gross Weight.

5.18.5.4. Computed Stopping Distance.

5.18.5.5. Recovery Field.

5.18.5.6. Runway Available.

5.18.5.7. Jettison Altitude/Location.

5.18.5.8. Jettison Amount.

5.18.5.9. Reason for Jettison.

5.18.5.10. Approval Authority.

5.19. Aircraft Speed. IAW this AFI, AFI 11-202V3 and the applicable Dash 1.

5.20. Bird/Wildlife Aircraft Strike Hazard (BASH) Programs. BASH programs are centralized unit efforts that provide information cross-feed, hazard identification, and a

consolidated course of action. As a minimum, unit commanders must implement the following procedures:

5.20. (934AW)The purpose of the BASH program. The purpose of the BASH program is to provide a wing program designed to minimize aircraft exposure to potentially hazardous bird strikes in the MSP local flying area. The Avian Hazard Advisory System (AHAS) now contains the unit web page for the 934 AW. The unit web page contains a one-stop look at all our training airports, drop zones areas and low-level SR routes for bird hazards. The web page is mandatory viewing by primary pilots, navigators, SOF and base operations personnel prior to each flight. The SOF is responsible to make the report available to the planning aircrew and will review it again between the time the aircrew departs base operations and takeoff. Changes will be relayed to the aircrew.

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

5.20.1. **(934AW)** Although the FAA does make wildlife activity advisories, the absence of Air Force personnel and observers requires Air Force aircrews to make their own estimations of appropriate bird watch conditions at MSP IAP-ARS and our local training bases. All aircrews encountering “moderate” or “severe” bird watch conditions at MSP IAP-ARS or the local training airfields are instructed to report such conditions to the command post, base operations, or the SOF as appropriate.

5.20.1.1. Bird Watch Condition Low - No operating restrictions.

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

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

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

5.20.2. **(934AW)** If an aircraft experiences a known or suspected bird strike on a local training mission, and the aircraft commander determines an immediate landing is not required, return to MSP and land as soon as conditions permit. Inbound to MSP; notify command post, base operations, or the SOF as appropriate. The aircraft commander will inform the SOF of the situation and fill out an AF Form 853, *Air Force Wildlife Strike Report*.

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

5.20.4. Consider bird migratory patterns during the en route portion of the mission to help minimize the potential of an in-flight bird strike. The Bird Avoidance Model (BAM) on HQ

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

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

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

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

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

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

5.21.1.2.1. **(Added-934AW)** The 96th Airlift Squadron (96 AS) will obtain authorization from the 934 OG/CC prior to conducting a Functional Check Flight (FCF). The 96 AS/DO is responsible for ensuring crew members participating in FCFs attend a briefing with Quality Assurance (QA) prior to the flight and debrief QA after the flight.

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

5.21.1.3.1. **(Added-934AW)** FCFs conducted in the local area will be flown in the Siren ATCAA and must be coordinated with Minneapolis ARTCC. Pilots performing FCFs in the local area will be familiar with the joint Minneapolis ARTCC/133 AW/934 AW Letter of Agreement to perform the FCF in the Siren ATCAA. This letter of agreement is located in the FCF Continuity Book located at the SOF counter.

5.21.1.4. The decision to approve a combined FCF and ferry flight is the responsibility of the MAJCOM/A3/DO.

5.21.1.5. The OG/CC will only certify highly experienced instructors as FCF crewmembers. The OG/CC will determine FCF crew complement after a thorough ORM assessment for that specific FCF flight.

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

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

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

5.22. Participation in Aerial Events. See AFI 11-209, *Air Force Participation in Aerial Events*, and the appropriate MAJCOM supplement. Aerial events must be sanctioned and individually approved by the appropriate military authority, and the Federal Aviation Administration (FAA). AFI 11-209 and AMC Supplement 1 identify events sanctioned for support and specify the approval authority for each type. AFI 11-209 stipulates that units participating in aerial events will ensure activities are coordinated with the FAA through the regional Air Force representative.

5.23. Hand-held (HH) GPS with Laptops for Moving Map Display (MMD).

5.23.1. The HH GPS and MMD are designed as a situational awareness tool. The pilot monitoring and navigators are designated the primary users of MMD. PICs may authorize other crewmembers to use the MMD to assist with situational awareness. Falcon View is the only AMC approved software for MMD use.

5.23.2. Aircrew members using MMD will immediately discontinue monitoring if safety of flight is inhibited or during any other situation the PIC determines it unsafe to use.

5.23.3. Do not use HH GPS/MMD for primary navigation. All chart and fixing requirements are still required. The hand-held GPS will not be used to update navigation equipment (SCNS/INS).

5.23.4. Before using the HH GPS in-flight, aircrew members must receive training and aircraft must be capable of supporting the HH GPS equipment.

5.23.5. Only GPS units approved for use with laptop computers will be used.

5.24. Traffic Alert and Collision Avoidance System (TCAS). It is imperative to follow resolution advisories (RAs) to obtain aircraft separation computed by TCAS. Failure to follow the computed RA may increase the probability of a midair collision. Pilots who deviate from an ATC clearance in response to an RA shall notify ATC of the deviation as soon as practical and

promptly return to the ATC clearance when the traffic conflict is resolved or obtain a new clearance.

5.25. Radar Altimeter.

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

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

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

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

5.26. Buddy and Windmill Taxi Starts. Buddy and windmill taxi starts may be performed when approved by the OG/CC or DIRMOBFOR. This authority may be delegated to the squadron commander or MC 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 crewmembers and all passengers will be loaded after completion of a buddy or windmill taxi start.

5.27. Reduced Power Operations (N/A for 3 Engine Operations). Pilots will normally use reduced power for takeoffs provided refusal speed (Vr) is equal to or greater than takeoff speed. Use normal takeoff power if Vr is less than takeoff speed.

5.27.1. Reduced power operation for normal takeoffs and takeoffs from stop-and-go landings will use a predicted torque corresponding to 900 degrees C TIT not to exceed 19,600 inch-pounds of torque. Power settings up to maximum power may be used during stop-and-go takeoffs to comply with training restrictions listed in this chapter. Maximum continuous power (970 degrees TIT for -15 engines) should be used to takeoff and climb to cruise altitudes.

5.27.2. Do not exceed maximum continuous power (932 degrees TIT for -7 engines or 970 degrees TIT for -15 engines) during cruise. For normal cruise operations 932 degrees TIT for dash 7 engines and 970 degrees TIT for dash 15 engines will be used. Cruise at a constant KTAS (280 KTAS for dash 7 engines and 300 KTAS for dash 15 engines), adjusting TIT at least every hour. For legs of 2 hours or less consider cruising at 260 or 270 KTAS (280 or 290 for dash 15 engines). On short legs with cruise altitude under 10,000 MSL, KIAS should be limited to 210 or less. On missions that are not time critical consider flying at a TAS corresponding to 850 degrees TIT (900 degrees TIT for -15 engines) to preserve first stage turbine vanes. This reduction in TIT will decrease fuel consumption by approximately 4%, increase turbine life, decrease sulfidation corrosion by approximately 200%, and increase thermocouple life.

5.27.3. Reduce power for formation takeoffs to a torque corresponding to maximum continuous power (970 degrees TIT for -15 engines). Formation leaders will brief takeoff torque when different series C-130 aircraft are in the same formation.

5.27.4. Reduced power is not authorized for max effort takeoffs.

5.28. Aircraft Recovery from Unprepared Surfaces. Aircrews will not normally attempt to recover an aircraft after inadvertent entry onto unprepared surfaces not suitable for taxi; ground crews will accomplish aircraft recovery. Unless an emergency dictates otherwise, aircrews may only accomplish recovery if there is no aircraft damage, the surface will support the aircraft, and the PIC has coordinated with appropriate MAJCOM headquarters maintenance authorities through 618 TACC or appropriate C2 agency.

Chapter 6

AIRCREW PROCEDURES

Section 6A—Pre-Mission

6.1. Aircrew Uniform.

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

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

6.1.2.1. See AFI 11-301V1, *Aircrew Life Support System (ALS) Program*, Attachment 1 for minimum aircrew clothing requirements. All crewmembers will have Nomex gloves in their possession.

6.1.2.2. It is recommended that primary crewmembers wear Nomex gloves during engine start, takeoff, and landing.

6.1.2.3. Crewmembers will remove rings and scarves before performing aircrew duties.

6.1.3. Personnel will have the appropriate items of clothing in their possession when flying in Arctic and Antarctic regions. ***EXCEPTION*:** Not applicable to transoceanic flights or when staging or transiting Elmendorf AFB AK.

6.2. Personal Requirements.

6.2.1. Passport. Crewmembers will carry a valid passport on all missions outside the CONUS. ***EXCEPTION:*** Unit commanders may authorize newly assigned personnel who have applied for, but not yet received, a passport to act as crewmembers on missions not scheduled to transit locations where passports are required.

6.2.2. Shot Record. Crewmembers must maintain worldwide shot requirements and carry their shot records on all missions outside the CONUS (except overseas units on local training missions).

6.2.3. Not Used.

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

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

6.2.6. FOD Hazards. Crewmembers will not wear wigs, hairpieces, rings, ornaments, or earrings in the aircraft or on the flight line. ***EXCEPTION:*** Crewmembers may wear plain elastic hair fasteners and/or pins, clips, or barrettes providing they do not interfere with the wearing of headsets, or the donning of oxygen equipment. They will be accounted for before and after flight.

6.2.6.1. Units will identify marking requirements for personal/professional equipment in their local supplement.

6.2.7. Helmets and Oxygen Masks. (N/A for AE crewmembers). Crewmembers will carry a personal helmet:

6.2.7.1. Anytime parachutes are required to be carried by the mission directive.

6.2.7.2. Whenever the aircrew requires night vision goggles or flash-blindness devices (MIL-G and/or PLTZ goggles).

6.2.7.3. When required for wear of the aircrew chemical defense ensemble.

6.2.7.4. For unpressurized flight operations above 10,000 feet MSL.

6.2.8. Flashlights. Each crewmember must carry an operable flashlight for night flights.

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

6.2.10. Tool and Airdrop Kits. At least one engineer's and one loadmaster's tool kit will be on board for all missions. One loadmaster airdrop kit will also be aboard the aircraft for aerial delivery missions. Units will identify tool kit contents and inventory procedures in their local supplement. As a minimum, the flight engineer tool kit will contain the tools necessary to perform the emergency actions in section 3 of the flight manual and hostile environment repair procedures. One NVG aircraft preparation kit will be on board for NVG missions.

6.2.10.1. **(Added-934AW)** Flight engineer tool kits and loadmaster tool kits will be combined in a single bag and maintained in each aircraft in the special tool kit storage compartment located in the upper right galley. Prior to every flight, the flight engineer will ensure the combined FE/LM tool kit is sealed and secured. If the kit is used during the flight or the seal is broken, the individual using or discovering the open kit will inventory the contents, initial the inventory card and reseal the tool kit. The POC for the FE/LM tool kit program is the chief flight engineer.

6.2.10.1.1. **(Added-934AW)** The contents of the FE/LM tool kits will be as follows.

6.2.10.1.1.1. **(Added-934AW)** 10' measuring tape.

6.2.10.1.1.2. **(Added-934AW)** 3/8" ratchet.

6.2.10.1.1.3. **(Added-934AW)** 6" common screwdriver.

6.2.10.1.1.4. **(Added-934AW)** #2 Phillips screwdriver.

6.2.10.1.1.5. **(Added-934AW)** Wrench, o/e 1/2" x 9/16".

6.2.10.1.1.6. **(Added-934AW)** Wrench, o/e 3/8" x 7/16".

6.2.10.1.1.7. **(Added-934AW)** Wrench, combination 3/8".

6.2.10.1.1.8. **(Added-934AW)** Wrench, ford 9".

6.2.10.1.1.9. **(Added-934AW)** Wrench, crescent 8".

6.2.10.1.1.10. **(Added-934AW)** Pliers, water pump.

6.2.10.1.1.11. **(Added-934AW)** Pliers, diagonal side cut.

6.2.10.1.1.12. **(Added-934AW)** Safety wire, .032”.

6.2.10.1.1.13. **(Added-934AW)** Wrench, 1 1/2”(open or closed).

6.2.10.1.1.14. **(Added-934AW)** Wrench, 1 7/16” (open or closed).

6.2.10.1.1.15. **(Added-934AW)** Zip lock bag with extra seals.

6.2.10.1.1.16. **(Added-934AW)** Ratchet wrench, 3/4” x 7/8”.

6.2.10.1.1.17. **(Added-934AW)** Fuse puller.

6.2.10.1.1.18. **(Added-934AW)** Inventory sheet and pouch.

6.2.10.2. **(Added-934AW)** Airdrop kits are individually issued hand-carried professional equipment items and will be maintained and serviced by each assigned loadmaster. Loadmasters will inventory the applicable kit before and after each use. The minimum contents of the loadmaster airdrop kit will be those items listed in AFI 11-2C-130 Vol 3, Chapter 19.3.

6.2.11. Hostile Environment Repair Kit. One Hostile Environment Repair Kit (HERK) will be onboard for all OCONUS and contingency deployment missions. The HERK will not normally be onboard the aircraft for CONUS and non-contingency missions. Units will identify where the HERK will be stored on the aircraft in the local supplement to this AFI. The flight engineer will ensure the HERK is onboard and servicable (sealed) during the aircraft preflight prior to departure. Additionally, the fight engineer will ensure one-each generator and starter pad is onboard the aircraft for missions requiring the HERK. The Herk will not be removed from the aircraft until mission completion, and then only by the owning unit.

6.2.11. **(934AW)** Hostile environment kits (HERK) will be maintained in each aircraft in the special tool kit storage compartment located in the upper right galley. If the HERK is opened, the flight engineer will report the usage to the chief flight engineer upon returning to home station or deployed location.

6.2.12. NVGs. All crewmembers will carry and preflight their own NVGs prior to flight for missions using NVGs. If available, one spare set of NVGs will be carried per crew. Each crewmember will carry approved spare batteries for their own NVGs. The spare will also be preflighted.

6.2.12.1. Both Pilots will wear the same type NVGs.

6.3. Pre-Mission Actions.

6.3.1. Before transiting areas outside the CONUS, aircrews will review theater-specific information necessary to successfully operate there. The review should include (but is not limited to):

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

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

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

6.3.5. Obtain required customs forms.

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

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

6.3.8. Ensure visas have been received, if required.

6.3.9. Obtain terrain charts for unfamiliar destinations if available.

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

6.3.11. Release available seats to passenger terminal. Coordinate with C2 agency to release available seats to the passenger terminal.

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

6.4. Aircrew Publications Requirements. Primary crewmembers will carry the publications specified in **Table 6.1** on all missions. Units may specify additional publications in their unit supplement. When the crew includes two crewmembers in the same specialty, (i.e. two loadmasters on airdrop missions) each will carry a checklist but otherwise only one set of publications is required. Units may establish a process to provide these publications onboard the aircraft in-lieu-of individuals carrying publications. This process will be described in the local unit supplement.

6.4. (934AW)934 AW Aircrew. 934 AW aircrew will maintain and carry their respective Aircraft Flight Manual (-1) checklist on every mission. Additionally, pilots and navigators will maintain and carry the Combat Mission Guide and the 96 AS Inflight Guide. Flight engineers will maintain and carry an Aircraft Flight Manual (-1) and Aircraft Performance Manual (-1-1).

Table 6.1. Aircrew Publications.

PUBLICATION	AIRCREW
Aircraft Flight Manual (-1)	E
Aircraft Performance Manual (-1-1)	E
Aircraft Flight Manual (SCNS -1-4)	N, (FP or CP, if navigator not on board aircraft)
Abbreviated Checklists	All crewmembers will carry the abbreviated checklist(s) for their crew position.
TO 1C-130-101	E
TO 1C-130A-9	L
AFI 11-202V3	FP or CP

AFI 11-2C-130V3	E
AFTTP 3-3.25 Combat Mission Guide	AC, FP or CP, and N
AFI 13-217, *Drop Zone and Landing Zone Operations*	N (FP or CP, if navigator not on board aircraft)
AFI 11-231, *Computed Air Release Point Procedures*, (Airdrop-qualified only)	N
TO 1C-130E-1-2 (AWADS only)	N

6.5. Airfield Review. Aircrews will consult the web-based airfield database maintained by HQ AMC/A36AS (Airfield Suitability Branch) and comply with the GDSS/GDSS2/ASRR for updates to airfield operability and weight bearing capability.

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

Section 6B—Predeparture

6.7. Integrated Management Tool (IMT) Account. Pilots will obtain an IMT account prior to operating on IFM-planned sorties. Download aircrew departure papers using the IMT account, at locations without an AMC C2 presence. For operational missions, ensure IMT account passwords are active prior to departing home station.

6.7.1. On receipt of the IFM package, Pilots will:

6.7.1.1. Review IFM papers for accuracy. (Weather, NOTAMS, dips, times and routing)

6.7.1.2. Validate the flight plan, and

6.7.1.3. Report discrepancies immediately to the flight manager.

6.7.2. The crew papers do not contain secure information from the ATO or SPINS. Flight managed missions clearly indicate that secure information such as tactical routings and threats must be reviewed prior to departure. Crews shall contact local Intel prior to departure.

6.7.3. Pilots are required to communicate with their flight manager or contracted dispatcher prior to departure on every flight managed mission.

6.8. Flight Crew Information File (FCIF).

6.8.1. Crewmembers will review FCIF, Volume 1, before all missions or ground aircrew duties, and update the FCIF currency record with the latest FCIF item number, date, and crewmember's initials.

6.8.2. Crewmembers delinquent in FCIF review or joining a mission en route will receive an FCIF update from a primary aircrew member counterpart on the mission.

6.8.3. Crewmembers not assigned or attached to the unit operating a mission will certify FCIF review by entering the last FCIF number and their initials behind their name on the file copy of the flight authorization or file copy of their crew orders.

6.9. Flight Crew Bulletins (FCB). Items in the FCB may include local procedures and policies concerning equipment and personnel generally not found in any other publications.

6.10. Mission Kits. Carry mission kits on all operational missions. Suggested items include:

NOTE: * Indicates mandatory for all missions away from home station.

6.10. (934AW)Navigators. Navigators will be responsible for inventorying and carrying the purple mission kit on all cross country missions.

6.10.1. Publications:

6.10.1.1. *AFI 11-401, *Aviation Management.*

6.10.1.2. *DoDM 4140.25-M, Vol. II Ch 16*, GOVERNMENT FUEL CARD PROGRAM MANAGEMENT OFFICE DoD FLEET CARD, AIR CARD®, AND SEA CARD®, which can be downloaded from **http://www.desc.dla.mil/DCM/DCMPage.asp?pageid=701**

6.10.1.3. *AMCI 11-208, *Tanker/Airlift Operations* (AMC missions only*)*.

6.10.1.4. Electronic Airfield Suitability and Restrictions Report (E-ASRR). Downloaded from HTTPS://WWW.AFD.SCOTT.AF.MIL/

6.10.1.5. *AMC Aircrew Border Clearance Guide.

6.10.1.6. AMC Handbook 11-214, *AMC Aircrew Hazardous Materials Handbook.*

6.10.1.7. *Flight Crew Bulletin (FCB).

6.10.1.8. AFI 11-289, *Phoenix Banner, Silver, Copper Operations.*

6.10.1.9. AFTTP 3-3.25, *Combat Fundamentals—C-130*.

6.10.2. Forms:

6.10.2.1. DD 1351-2, **Travel Voucher or Sub Voucher**.

6.10.2.2. DD 1351-2C, **Travel Voucher or Sub Voucher (Continuation Sheet)**.

6.10.2.3. *CBP Form 6059B, **US Customs and Border Protection Declaration Form**.

6.10.2.4. DD 1748-2, **Airdrop Malfunction Report (Personnel-Cargo)**.

6.10.2.5. *DD 2131, **Cargo/Passenger Manifest**.

6.10.2.6. *CBP 7507, **General Declaration Outward/Inward**.

6.10.2.7. *AF IMT 15, **United States Air Force Invoice**.

6.10.2.8. Standard Forms 44, *Purchase Order-Invoice-Voucher***.**

6.10.2.9. AF IMT 457, **USAF Hazard Report**.

6.10.2.10. *AF IMT 651, **Hazardous Air Traffic Report (HATR)**.

6.10.2.11. *AFTO IMT 781, **ARMS Aircrew/Mission Flight Data Document**.

6.10.2.12. *AF IMT 1297, **Temporary Issue Receipt**.

6.10.2.13. AF IMT 3211, **Customer Comments**.

6.10.2.14. *AF IMT 4108, **C-130 Fuel Log**.

6.10.2.15. *C-130 Flight Data Worksheet.

6.10.2.16. AMC IMT 43, **AMC Transient Aircrew Comments**.

6.10.2.17. AMC IMT 54, **Aircraft Commander's Report on Services/Facilities**.

6.10.2.18. AMC IMT 97**, AMC In-Flight Emergency and Unusual Occurrence Worksheet**.

6.10.2.19. AF IMT 711B, **USAF Mishap Report**.

6.10.2.20. *AF IMT 4031, **Crew Resource Management (CRM) Assessment Sheet**.

6.10.2.21. *AF IMT 4075, **Aircraft Load Data Worksheet**.

6.10.2.22. AF IMT 4064, **C-130 Takeoff and Landing Data Card**.

6.10.2.23. Japanese Customs Service Forms.

6.10.3. Orders:

6.10.3.1. DD1610, **Request and Authorization for TDY Travel of DOD Personnel**.

6.10.3.2. AF IMT 1631, **NATO Travel Orders (when required**).

6.10.3.3. *AMC IMT 4327A, **Flight Authorization (FA)** (or MAJCOM prescribed according to AFI 11-401*)*.

6.10.4. Miscellaneous:

6.10.4.1. *Box car seals.

6.10.4.2. *Masking tape.

6.11. Route Navigation Kits.

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

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

6.11.2.1. Units issuing Laptops to aircrews with updated electronic FLIP planning documents (GP, AP/1, AP/1B, AP/2, AP/3) do not have to issue paper version.

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

Table 6.2. Route Navigation Kit Contents

Item (applicable to area of operation):	Number
FLIP GP Planning (sections GP, AP/1, AP/1B, AP/2, AP/3)	1
FLIP IFR Supplement	1
FLIP Flight Information Handbook (FIH)	1
FLIP En route (high and low)	2
FLIP Instrument Approach Procedures (high and low)	*3
Instrument Departures Europe and North Africa (high and low)	*3
Topographical and Sectional Charts for areas of operation (GNC/OPC/TPC/JNC/JOG/Sectionals)	as required
FLIP VFR Supplement	1
DOD Area Arrival Charts	(2) if available
Note: * Two required when a navigator is not part of the crew.	

6.12. Briefing Requirements.

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

6.12.2. Pilot in Command Briefing. Cover all applicable items of the operations briefing, including MAJCOM, NAF, unit special interest items (SIIs), and ORM. Brief crewmembers on the specific mission details if not previously accomplished. Use briefing guides contained in AFTTP 3-3.25.

6.12.2.1. In the en route system, the PIC will ensure that an aircrew briefing is conducted prior to the first sortie of the day. As a minimum, brief crewmembers on specific mission details for that day's sortie(s) and the ORM factors for the mission. Complete this briefing prior to engine start.

6.12.2.2. NVG Briefing Requirements. For missions conducting NVG operations crews will review and coordinate NVG failure procedures for all phases of the mission. Any crewmember who experiences NVG problems will inform the rest of the crew. During cargo compartment emergencies, return to normal lighting until the emergency is resolved. Discuss actions for Smoke and Fumes in the aircraft.

6.12.3. Specialized Briefing. Use specialized briefings to detail operating procedures or SIIs peculiar to various crew positions, and to answer questions relating to those specialties. Specialized briefings review formation tactics and procedures, and technical instructions for specialized equipment operations. All crewmembers should attend each briefing. Crewmembers may only be excused from specialized briefings for pre-flight duties; however, the PIC will back brief all appropriate items. PICs will use AFTTP 3-3.25 briefing guides. If the briefing guide is not contained in AFTTP 3-3.25, then a MAJCOM approved briefing guide will be used.

6.12.4. Weather Briefings. The PIC will obtain a briefing on current weather, trends, and forecast for the proposed route, destination, and alternates. The PIC will brief primary crewmembers on appropriate weather conditions before departure.

6.12.4.1. Aircrews flying flight-managed sorties will use the weather briefing provided with the IFM aircrew departure papers. Local weather flights/agencies may update local takeoff weather data, but aircrews, working through their flight manager/dispatcher, will use 618 TACC weather operations (or the Operational Weather Squadron (OWS) supporting the theater C2 agency) as the final arbiter for weather-related issues and further updates.

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

6.12.4.3. If adequate services are not available, and the crew cannot contact their home weather flight, OWS, or 618 TACC weather operations, obtain weather through any means available prior to mission accomplishment.

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

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

6.12.5. Buffer Zone. Prior to operating an aircraft within or adjacent to an established buffer zone, the PIC will ensure primary crewmembers are briefed on current buffer zone procedures outlined in appropriate directives.

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

6.12.7. IFM Briefing. On flight managed sorties, the PIC or the designated representative will, after reviewing the Aircrew Departure Papers, contact the flight manager to obtain final sortie details and to resolve any discrepancies or disagreements.

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

6.13. Call Signs.

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

6.13.2. Operational Missions. Use call signs assigned by OPORD, FRAG, or diplomatic clearance. If no call sign has been assigned, use unit static call signs. When flying AMC missions, and no other call sign has been assigned, use the “REACH” call sign followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number (or as required by diplomatic clearance). To complete flight plans, put the letters “RCH” followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number.

6.13.3. The Reach 01 and 18 call signs are reserved for the AMC/CC and the 18 AF/CC.

6.13.4. Aeromedical Evacuation. For actual AE missions, use the call sign "Evac" followed by the five-digit aircraft number (example, Evac 12345) or mission designator. Refer to FLIP GP Chapter 4. When the AE portion of the mission is completed, normal call signs will be used. This does not alleviate the responsibility to use diplomatically cleared call signs when required.

6.13.5. Search and Rescue. On actual search, rescue, and recovery missions, use the call sign "Air Force Rescue" plus the last five digits of the aircraft tail number.

6.13.6. **(Added-934AW)** Local Tactical Mission Sorties. On local tactical missions, use a formation call sign of "VIKNG 61." Individual aircraft should use a call sign commensurate with their position in the formation. (i.e. flight lead – VIKNG 61, number two – VIKNG 62, number three –VIKNG 63, etc.) Formation recovery missions will use a formation call sign of "VIKING 91." Individual aircraft should use a call sign commensurate with their position in the formation. (i.e. flight lead – VIKNG 91, number two – VIKNG 92, number three – VIKNG 93, etc.) The numbering system is directly related to the aircraft position in the flight and will be reported in that manner to air traffic control agencies. Crews will ensure squawk codes are swapped when formation lead is swapped.

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

6.15. Flight Plan/Data Verification.

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

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

6.15.1.2. Verify CFPs for route of flight and fuel computation accuracy before departure. Pass any flight plan discrepancies to the C2 flight planning office. On flight-managed sorties, promptly notify the flight manager of any flight plan discrepancies, to ensure the correct route of flight is filed with air traffic control. Identify inaccurate CFP winds to 618 TACC/XOCZF if the average wind for a route segment exceeds either 30° error in direction or 25 knots in speed.

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

6.15.2.1. Latitude/longitude from current FLIP.

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

6.15.2.3. Ground Based NAVAIDs.

6.15.3. The flight engineer will complete AF IMT 4064, **C-130 Takeoff and Landing Data Card** and AF IMT 4063, **Mini C-130 TOLD Card**, as specified in **Chapter 12**. Pilots and copilots will use AF IMT 4063. A pilot crewmember, or additional flight engineer, will

cross-check the AF IMT 4063 for accuracy by using the performance manual or approved tabulated data. As a minimum, the person checking the data will:

6.15.3.1. Verify gross weight independently from the AF IMT 4063.

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

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

6.16. Departure Planning. Use AFI 11-202V3, AFMAN 11-217, this chapter, and the appropriate MAJCOM supplements. Regardless of the type of departure flown (IFR/VFR), review the following (as appropriate): IFR Departure Procedure, instrument approach plate, NOTAMS, GDSS Giant Report, and suitable terrain charts. The PIC will provide the obstacle height, distance, and gradient information necessary for performance computations to the flight engineer.

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

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

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

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

6.16.1.2.2. One Engine Inoperative (OEI) climb capability shall ensure departure or emergency return route provides obstacle avoidance. ***NOTE:*** If unable to comply with any of the above conditions, download cargo/fuel or delay until conditions that are more favorable exist.

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

6.16.1.4. When departing VFR, maintain VFR cloud clearances until obtaining an IFR clearance or reaching the IFR MEA.

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

6.16.2.1. If the airport does not have an authorized IFR departure method, depart VFR IAW **6.16.1**. An IFR departure is not authorized at airfields without an instrument approach.

6.16.2.2. IFR departures require detailed planning to ensure obstacles and high terrain are avoided. Adhere to screen height/departure end of runway (DER) requirements for

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

6.16.2.2.1. Special Departure Procedure: Published on SDP.

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

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

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

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

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

6.16.2.2.7. All others: 35 feet unless published.

6.16.2.3. Aircraft must be able to meet the published climb gradient for the departure runway with all engines operating. If no minimum climb gradient is published, 200 ft/nm will be used. ***NOTE:*** In the event the aircraft is unable to meet the published ALL ENGINE climb gradient, download cargo/fuel or delay until conditions that are more favorable exist.

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

6.16.2.4.1. Special Departure Procedures (SDPs). SDPs are MDS-specific OEI escape procedures intended only for emergency use. They are applicable after the loss of an engine and, where available, should be used for engine-out departure planning. In order for an aircrew to use an SDP, both pilots, navigator (when applicable) and flight engineer must have completed required training. Loadmasters do not require SDP training. Downloading the SDP ensures crews have the most current edition available. All C-130 SDPs posted on the Jeppesen AFOPSDATA website are approved. Jeppesen website: HTTPS://WWW.JEPPESEN.COM; Username LOGIN: usafsdp; PASSWORD: aircrews 'Ad hoc' requests for fields not currently listed may be requested through OGV NLT 48 hrs prior to scheduled departure. MAJCOM/A3V authorizes the use of Ad Hoc SDPs for a maximum of 30 days after the analysis date. The SDP analysis date is located in the upper left-hand corner of the takeoff performance sheet.

6.16.2.4.2. Minimum climb gradient. The TERPS standard minimum climb gradient is 200 ft/nm, based on the standard obstacle clearance surface (OCS) of 152 ft/nm plus the required obstacle clearance (ROC) of 48 ft/nm, except when utilizing a SDP. If a SDP is not available, the crew must ensure compliance with any obstacle-based minimum climb gradients for the selected departure, with one-engine inoperative.

Minimum climb gradients may be published as a "Trouble T" restriction in the IFR Take-off Minimums section of FLIP or on a SID. When requires for mission accomplishment, crews may subtract 48 ft/nm from published climb gradients before computing engine-out takeoff data. Minimum climb gradients do not take into account low, close in obstacles (Obstacles or terrain 200' AGL and below) normally published as a NOTE on the SID or IFR departure procedure (Trouble T). Crews must also ensure the aircraft can clear these obstacles by computing the MTOGW for the obstacles and comparing it to that calculated for the climb restriction. Takeoff GW must not exceed that which would, in the event of an engine failure, lower the rate of climb to less than a 2.5 percent climb gradient (152-feet per NM) unless departing from an airfield with an approved SDP.

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

6.16.4. Gross Weight (GW). Ensure that the aircraft does not exceed the maximum GW, zero fuel weight, or center of gravity limitations specified in the aircraft flight manual. GW may be further restricted by operating conditions such as, icing, temperature, pressure altitude, runway length and slope, aerodrome weight bearing capacity, departure maneuvering, required climb gradients, and obstacles.

6.16.4.1. Takeoff GW must not exceed that which would, in the event of an engine failure, lower the rate of climb to less than a 2.5 percent climb gradient (152-feet per NM) unless departing from an airfield with an approved SDP.

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

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

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

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

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

6.19. Departure Alternates.

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

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

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

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

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

6.20.1. File two alternates when:

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

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

6.20.1.3. The forecast surface winds (intermittent or prevailing) exceed limits corrected for RCR.

6.20.2. File an alternate, regardless of forecast weather, when the departure or destination aerodrome is outside the CONUS. ***EXCEPTION***: OCONUS, intra-theater flights that do not exceed 3-hours, comply with basic AFI 11-202V3.

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

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

6.20.3.2. The prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach, for ETA plus 2 hours. However, if a precision approach is available, the ceiling or visibility may be intermittently below non-precision approach minimums (excluding ASR), but not below precision approach

minimums (for ETA plus 2 hours). ***NOTE:*** See **Chapter 14** for fuel planning considerations to a remote or island destination.

6.20.4. DELETED

6.21. Adverse Weather.

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

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

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

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

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

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

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

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

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

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

6.21.3.1. 20 NMs at or above flight level FL 230.

6.21.3.2. 10 NMs below FL230.

6.21.3.3. 5 NMs for tactical low-level operations below FL230 provided the outside air temperature is at or above 0°C at flight altitude. Avoid gust fronts and winds preceding a rapidly moving thunderstorm. ***WARNING:*** Aircraft damage may occur 20NMs or more

from any thunderstorms. Aircrews must familiarize themselves with information on thunderstorm development and hazards. Refer to AFH 11-203 Volume 1, *Weather for Aircrews*.

6.21.4. The use of ground-based radar as a means of thunderstorm avoidance should only be used to assist in departing an inadvertently penetrated area of significant weather. It should never be considered a normal avoidance procedure. When relying exclusively on ground-based radar for weather avoidance, and the ground controller is unable to provide avoidance instructions, attempt to maintain VMC by:

6.21.4.1. Changing routing.

6.21.4.2. Diverting to alternate.

6.21.4.3. Declaring an emergency and requesting priority assistance.

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

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

6.21.6.1. Attempt to maintain VMC.

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

6.21.6.3. Avoid areas of high lightning potential, i.e., clouds within plus or minus 5,000 feet of the freezing level or plus or minus 8° C of the freezing level. ***NOTE***: Approaches or departures may be accomplished when thunderstorms are within 10NMs providing they are not producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and are not forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

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

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

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

6.21.10. Volcanic Dust Precautions. Aircraft flight operations in areas of forecast or known volcanic activity or dust is prohibited. Plan all missions to avoid flying downwind of volcanic activity, and in all cases by at least 20 NMs.

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

6.21.11.1. Within 8C of freezing level.

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

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

6.22.1. Flying units will develop a local ORM program to include personal ORM risk assessment for all missions.

6.22.2. The PIC will ensure an ORM risk assessment is accomplished by all crewmembers as part of pre-flight activities.

Section 6C—Preflight

6.23. AFTO IMT 781.

6.23.1. Review AFTO Forms 781 series before applying power to the aircraft or operating aircraft systems. An exceptional/conditional release must be signed before flight IAW T.O. 00-20-1. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional/conditional release. If one of these individuals is not available, the PIC may sign the exceptional/conditional release. The pilot's signature is valid for his/her flight only. When a conditional release is granted, the conditions of the release will be described by an appropriate entry in the AFTO Forms 781A and the releaser will enter "Conditional, see AFTO Forms 781A, (page ___, and item ___)" in the next open line after the exceptional release signature. Ensure that the DD1896, **Jet Fuel Identaplate** and AIR card are aboard the aircraft.

6.23.1. **(934AW)** When an aircrew is at home station, maintenance personnel are available and will sign off the exceptional release (ER). Aircraft commanders will not sign off the ER at home station without OG/CC, or an OG/CC designated representative's approval. Exceptions will be coordinated through the SOF.

6.23.2. One-Time Flights. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use, provided the aircraft is airworthy for one flight to another station. Refer to T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures,* for downgrade authority and procedures. After the maintenance release is obtained, coordinate mission requirements with the controlling agency. The PIC's concurrence is required before the aircraft can be flown.

6.23.3. For Red X clearing procedures at stations without maintenance support refer to **paragraph 12.3**.

6.24. Aircraft Servicing and Ground Operations.

6.24.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-172 and refueling job guide. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed. Crewmembers may augment maintenance refueling teams at en route stops.

6.24.1.1. Units will not refuel to a "standard" ramp load. The aircraft will be refueled after the aircraft tail number is assigned and the exact mission-specific fuel requirement is known. The goal is to provide an accurate fuel requirement before refueling begins to prevent defueling or having a second refueling.

6.24.2. Aircraft Dash One Preflight Inspection Requirements.

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

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

6.24.2.1.2. Another maintenance dash six preflight is performed.

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

6.24.3. Fire Protection and Crash Rescue.

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

6.24.3.2. A fireguard is required for all engine starts including the GTC/APU. A crewmember or ground controller may act as fireguard.

6.24.4. Aircrew and Maintenance Engine Runs.

6.24.4.1. 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:

6.24.4.1.1. 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.

6.24.4.1.2. Use the pilot, flight engineer, and loadmaster checklists. Begin with the "cockpit checklist," and complete all appropriate checklists through the "before leaving the airplane" checklist.

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

6.24.4.1.4. Operate symmetrical engines when power settings above ground idle are required.

6.24.5. 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 PIC will coordinate with the senior maintenance officer or superintendent to ensure the towing supervisor and crew are qualified. At non-USAF installations, the PIC must have approval from the airfield operations officer or manager prior to towing. The PIC will ensure the tow team supervisor briefs all personnel on their duties and the associated hazards. Proper checklists will be used. If any doubt exists as to the qualification of tow team personnel or the safety of the operation, make no attempt to

tow the aircraft until qualified Air Force personnel can be located. Under no circumstances will any crewmember act as the towing supervisor.

6.24.6. Aircrew members are prohibited from climbing onto the upper fuselage or wing surfaces unless there is an operational necessity. When operational conditions dictate that aircrew members must climb onto upper fuselage or wing surfaces, they will do so only when conditions are dry and high winds do not exist.

6.24.6.1. Aircraft commanders will ensure no other personnel (excluding qualified ops/maintenance personnel) have access to, or be allowed to, climb onto the fuselage or wings.

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

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

6.25.1.1. Parking and receiving.

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

6.25.1.3. Supervision of minor maintenance within local capability.

6.25.1.4. Minor configuration changes to meet mission tasking.

6.25.1.5. Securing the aircraft before entering crew rest.

6.25.1.6. Coordinating aircraft security requirements.

6.25.1.7. Documenting AFTO 781-series forms.

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

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

6.26. Life Support Requirements.

6.26.1. Oxygen. Oxygen on board for takeoff must be sufficient to accomplish the planned flight from the equal time point (ETP) should oxygen be required (minimum 5 liters).

6.26.1.1. Since the C-130 flight deck can accommodate more crewmembers than there are oxygen regulators, all C-130 aircraft will have three emergency passenger oxygen systems (EPOS), or protective breathing equipment (PBE) permanently pre-positioned on the aircraft. The EPOS/PBEs may be stored on the overhead storage rack when not required on the flight deck.

6.26.1.2. On missions carrying passengers/patients, one EPOS per passenger/patient will be available regardless of planned flight altitude. EPOS will be distributed or placed

throughout the cabin/cargo area so that any passenger/patient has quick access to oxygen regardless of where they are should depressurization occur.

6.26.1.3. Do not remove the loadmaster's emergency equipment (cargo compartment quick dons/smoke masks) for use by flight deck crewmembers.

6.26.1.4. Aircrew members will comply with the oxygen requirements in AFI 11-202V3.

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

6.26.1.6. Crewmembers that do not have access to the aircraft oxygen system will have an EPOS or PBE within arm's reach for flights above 10,000 feet.

6.26.1.7. Normally, unpressurized flight will not be planned above 18,000 feet cabin altitude (except certain airdrop missions). Aircrews required to fly unpressurized missions above 18,000 will pre-breathe 100 percent oxygen in accordance with **Chapter 19**.

6.26.2. Rafts. On overwater flights do not carry more passengers and crewmembers than wing well life rafts will accommodate.

6.26.3. Life preserver units (LPUs) or Personal Floatation Device. The loadmaster will place an LPU within easy reach of each passenger and aircrew member before takeoff on overwater flights. Crewmembers will fit and adjust LPUs (if applicable) for overwater flights and will wear them on overwater missions below 2,000 feet. (EXCEPTION: LPUs need not be worn for takeoffs, landings, or approaches). Ensure the appropriate number and type of life preservers are aboard for overwater missions carrying children and infants.

6.26.4. Parachutes:

6.26.4.1. DELETED

6.26.4.2. Personnel performing duties near an open (or suspected open) door/hatch/ramp in-flight will be restrained by a safety harness, or wear a parachute.

6.26.4.3. Either wear, or have prefit and prepositioned, parachutes and helmets during specified combat conditions or exercise. Loadmasters will wear a restraining harness instead of a parachute during airdrops below 800 feet AGL or when performing duties near an open exit above 14,000 MSL.

6.26.5. Loadmasters (or other crewmembers) required to be positioned in paratroop door during combat or contingency missions with hostilities, or while participating in training missions that enable aircrews to improve their visual threat scanning techniques and procedures will be restrained in a restraint harness as follows:

6.26.5.1. Helmets will be worn and paratroop door armor will be installed. EXCEPTION: Paratroop door armor is not required on training missions.

6.26.5.2. Route the restraint harness straps (NSN 1680-01-314-3184) depicted in TO 13A1-1-1 through the support braces forward and aft of the paratroop doors with a girth hitch and attach to the restraint harness riser quick disconnect fittings. Ensure the leg and

chest straps are connected and attach the restraint harness lifeline to a floor/dual rail tiedown ring.

6.26.5.3. When restraint harness straps are not available, 5000 lb tiedown straps may be used to secure the restraint harness. Route a tiedown strap around each of the support braces forward and aft of the paratroop doors and attach the hook to the restraint harness riser clip. If the restraint harness does not have the riser clips, route the hook end of the tiedown strap through each side of the harness in the area the riser clips should be positioned and attach the hook back into the strap.

6.26.5.4. Attach the restraint harness lifeline to a dual rail tiedown ring directly under the paratroop door and adjust to limit vertical movement.

6.26.6. MA-1 Portable Oxygen Bottles.

6.26.6.1. There are three types of A-21 regulators on MA-1 portable oxygen bottles, unmodified, modified and modified2. Except for fill times, operation of the bottles are identical. Refill valve type is determined by viewing the inside of the fill nozzle and/or identa-plate as specified below:

6.26.6.1.1. Unmodified: Refill valves have a push valve inside the nozzle resembling a standard tire valve stem.

6.26.6.1.2. Modified: Refill valves have a brass plate/filter covering inside of the nozzle and no valve stem is visible.

6.26.6.1.3. Modified2 (Fast Fill): Refill valves have a brass plate/filter covering inside of the nozzle and no valve stem is visible. Part number on the identa-plate is one of the following: 9010A4, 9010A5, 3260007-0201, 3260007-0103.

6.26.6.2. Ensure a minimum of two unmodified/modified2 bottles are installed on the aircraft, one in the forward cargo compartment and the other in the pilot position. Additional unmodified/modified2 bottles should be installed in the cargo compartment first.

6.26.6.2.1. Home Station Departures. A waiver to the minimum number of required unmodified/Modified2 bottles may be granted on a case-by-case basis. (see paragraph 4.3.)

6.26.6.2.2. En Route Departures. Maintain minimum number of unmodified/Modified2 . If unable, continue until reaching a location with replacement bottle(s).

6.26.6.2.3. All additional bottles required for AE crewmembers will be unmodified/Modified2.

6.26.6.3. During emergencies use unmodified/Modified2 bottle, if practical.

6.27. Fleet Service. Ensure the required fleet service items are aboard the aircraft early enough to permit inventory prior to engine start.

6.28. Cargo Documentation. Proper cargo or mail documentation will accompany each load.

6.28.1. Load Data Information (Applicable to AFRC/ANG completing 618 TACC-directed missions). At stations where there is no mobility air transportation function, the aircrew will

collect the required load information on each leg, and submit it to the first station, which has such a function. The report will be submitted on AF Forms 4075, **Aircraft Load Data Worksheet**.

6.29. Airlifting Hazardous Cargo.

6.29.1. AMCH 11-214, *AMC Aircrew Hazardous Material Handbook*, contains a description of the types and classes of hazardous cargo that may be carried. PICs are responsible for ensuring that all procedures contained in AMCH 11-214 are complied with when airlifting hazardous cargo on AMC missions.

6.29.1.1. Procedures in **paragraph 6.29.2** apply when any quantity of the following materials are transported:

6.29.1.1.1. DoD class or division 1.1, 1.2, 1.3 (explosives).

6.29.1.1.2. Class or division 2.3 (poison gas).

6.29.1.1.3. Class or division 6.1, (poison) PG 1, zone A and B.

6.29.1.1.4. Class 7 (radioactive yellow labe).

6.29.1.1.5. Class 4.3 (dangerous when wet).

6.29.1.1.6. Nuclear weapons, nuclear components, inert devices.

6.29.1.1.7. DoD hazard class or division 1.4 that transit the United Kingdom, Italy, or Hawaii.

6.29.1.2. Procedures also apply to nuclear related cargo, toxic chemical ammunition, highly toxic substances, hazard division 1.1 through 1.3 explosives, and infectious substances (including biological and etiological materials). In addition, it applies to Class 7 (Radioactive materials), which require a yellow III Label, and all other hazard classes or divisions, (except class 9 and other regulated material (ORM-D)) when shipped in quantities of 1,000 pounds (455 Kgs) or more aggregate weight.

6.29.1.3. For more information regarding hazardous materials, refer to AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipment.*

6.29.2. Flight Planning. Based on the Hazardous Cargo Briefing, the PIC will:

6.29.2.1. Enter "Hazardous Cargo" and the mission identifier or flight number in the appropriate section of the flight plan. Use *Remarks* section of DD 175, *Military Flight Plan* and *Other Information* section of DD 1801, *International Flight Plan, DOD*. Refer to the FCG for country specific requirements concerning over-flight when transporting hazardous materials cargo.

6.29.2.2. If possible, plan the flight to minimize overflying heavily populated or otherwise critical areas. Approach, landing, and takeoff tracks are excluded.

6.29.2.3. Prepare a departure message at stations when a C2 center is not available. The remarks section of the departure message will include: Class of hazardous material, DOD class or division for explosives, net explosive weight (NEW), and gross weight. If required, request special handling (e.g., isolated parking, security, technical escort teams, etc.).

6.29.2.4. If estimated time en route (ETE) is less than 1 hour, or if other circumstances preclude timely message receipt at destination, notify the next destination of the ETA and hazardous cargo information. listed in **paragraph 6.29.1.3**. If available, C2 will relay required information to next destination.

6.30. Handling of Classified Cargo, Registered Mail, Mission Capable Parts (MICAP), Very, Very Important Part (VVIP), Forward Supply System (FSS) Shipments, and Courier Material.

6.30.1. MICAP, VVIP, sensitive cargo, courier materials, and registered mail moving within the normal airlift system are receipted at the on and offload stations using the air cargo manifest. For unit moves operated in accordance with Defense Transportation Regulation (DTR), Part III, Mobility, classified or sensitive cargo movement is normally manifested utilizing the DD 2130-2, **C-130A/B/E/H Cargo Manifest** or similar automated product (such as CALM or AALPS), and will normally be accompanied by a unit courier. However, if classified/sensitive unit cargo is offered without an accompanying courier, the DD1907, **Signature Tally Record,** must be used.

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

6.30.1.1.1. Primary crewmembers will not be designated couriers without the consent of the PIC.

6.30.1.1.2. Crewmembers on aircraft scheduled to make an extended en route stop at a location where DCS couriers cannot provide en route support will not be designated as couriers.

6.30.2. During stops at en route locations supported by DCS stations, DCS couriers are required to meet designated couriers, guard and protect the material.

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

6.30.2.1.1. DCS courier.

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

6.30.2.1.3. US Department of State Diplomatic Courier.

6.30.2.1.4. US Department of State activity.

6.30.2.1.5. US military guards.

6.30.2.1.6. US DOD civilian guards.

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

6.30.4. Life or death urgency shipments consist of biological or other medical supplies of such urgency that human life is dependent upon immediate receipt. Shipments will be

manifested separately and the manifest annotated with the words LIFE OR DEATH URGENCY. All shipments will be handled on a hand-to-hand receipt basis, using either the air cargo manifest or the DD 1907, for unit moves. The PIC will be briefed on the urgency of the shipment and be made the custodian during flight.

Section 6D—Departure

6.31. On Time Takeoffs. Mission departures are on time if the aircraft is airborne within -20/+14 minutes of scheduled takeoff time or as specified in a MAJCOM supplement.

6.31.1. Scheduled takeoff time may be adjusted to make good a time over target (TOT) or time of arrival (TOA). PICs shall notify C2 agency before takeoff to adjust the scheduled takeoff time.

6.31.2. Early Departures. Early departures are authorized to prevent a delay due to weather, ATC restrictions, airfield or aircraft operational limitations, to adjust mission flow during a large-scale operation, or if approved through C2 channels provided the impact on local and downrange facilities and crew duty is evaluated. When on a flight managed sortie, contact the flight manager with the early go request at the earliest opportunity.

6.32. NVG Departures.

6.32.1. NVG Departure Weather Minimums. Weather minimums for NVG departures for crewmembers who are non-current and/or unqualified is 1500/3. Current and qualified NVG aircrews may fly NVG departures in weather down to 300/1. Crews must give careful consideration to potential hazards during the critical phase of flight. Other weather limitations are IAW this instruction and AFI 11-202V3. NVGs have inherent limitations which can further be reduced by poor weather conditions. Crews will consider weather conditions, moon illumination and position, sky glow at dawn and dusk, cultural lighting, and weapon/expendable effects when planning NVG operations.

6.32.2. NVG Malfunctions During Takeoff. During an NVG takeoff, if the PF experiences NVG failure takeoff may be continued at the discretion of the PIC. If NVG malfunctions occur after the PM states GO, consideration should be given to either continuing the takeoff as the PF transitions to an IMC takeoff or transferring control of the aircraft as the situation dictates. If either pilot's NVGs fail after takeoff, continue the climb out and follow the appropriate procedures for loss of NVGs. The PM will be ready to immediately assume aircraft control if the PF experiences spatial disorientation or an NVG malfunction. Pilots must exercise sound and conservative judgment to continue NVG operations with aircraft malfunctions.

Section 6E—En Route

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

6.33.1. Before an oceanic flight, plot the oceanic portion on an appropriate chart. Annotate the chart with the mission number and date. If practical, chart may be reused. Refer to **Chapter 11** for chart requirements.

6.33.2. Another pilot or navigator will verify waypoint data inserted into the SCNS/INS. Check both the coordinate information and the distances between waypoints against the flight plan.

6.33.3. Category I Routes.

6.33.3.1. When approaching each waypoint on a Category I route, the PM will recheck coordinates for the next two waypoints.

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

6.33.4. Upon return to home station, turn in the charts (copies if reused) and applicable computer flight plans to the squadron. Squadrons will retain the charts, computer flight plans, and associated materials for a minimum of 3 months.

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

6.33.5.1. 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.

6.33.5.2. Consistent with international law, the US recognizes sea claims up to 12 NMs. Diplomatic constraints and/or a lack of diplomatic clearances usually result in missions operating in international airspace. Therefore, it is imperative sufficient information be provided far enough in advance to allow compliance with FCG requirements established by the countries concerned. The US does not normally recognize territorial claims beyond 12 NMs; however, specific guidance from certain US authorities may establish limits, which differ from the standard.

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

6.33.5.4. 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).

6.33.5.5. 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.

6.33.5.6. 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.

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

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

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

6.34. Navigational Aid Capability.

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

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

6.34.2. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. Pilots will refer to FLIP AP/2 and the following for RVSM requirements:

6.34.2.1. Both pilots' altimeters, at least one autopilot, the altitude advisory system, and the transponder, must be fully operational. The PIC will request a new clearance to avoid this airspace should any of this equipment fail.

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

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

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

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

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

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

6.34.3. Required Navigation Performance (RNP) Airspace. Airspace where RNP is applied is considered special qualification airspace. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between routes. Pilots will immediately notify ATC if any of the required equipment fails after entry into RNP-10 airspace and coordinate a plan of action. Document in the aircraft forms malfunctions or failures of RNP required equipment. C-130 aircraft 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.

6.34.3.1. RNP-10. C-130 aircraft may operate up to 6.2-hours (after entering the nav mode in SCNS) of flight in RNP-10 airspace without an update. If an automatic 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.

6.34.4. Basic Area Navigation (BRNAV) Airspace. Airspace where BRNAV is applied is considered special qualification airspace. BRNAV navigation accuracy criteria is RNP-5. Pilots will immediately notify ATC if any of the required equipment fails after entry into BRNAV airspace and coordinate a plan of action. Document in the aircraft forms malfunctions or failures of RNP required equipment. C-130 aircraft are approved for BRNAV operations only with a qualified navigator at the navigator's station.

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

6.35.1. In-flight harassment or hostile action against aircraft. Aircraft subjected to harassment or hostile action by foreign aircraft will immediately contact the nearest USAF air and ground voice facility and report the encounter. Include aircraft nationality, type, insignia, or any other identifying features; 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.

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

6.36. In-flight Meals. Pilots should not eat meals at the same time, and their meals should consist of different menu items.

6.37. Communications.

6.37.1. Crews should conduct an HF radio ground check before takeoff if use of the HF radio may be required for ATC or C2 communications. Attempt to establish HF contact before going out of UHF/VHF range. If unable to establish HF contact with the controlling

HF station, and an alternate means of relay of ATC information is not available, the aircraft should return to the nearest suitable support base.

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

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

6.38.1. Notification of C2 Agencies. When practical after completing the aircraft emergency action checklists and associated actions, the PIC shall furnish ATC and appropriate C2 agencies with a description of the difficulty, assistance required, intentions, and any other pertinent information. When on a flight managed sortie, contact the FM listed in the departure papers via phone patch or any available means for emergency divert assistance such as routing, weather, NOTAM and ATS clearance.

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

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

6.38.2.2. En route. Attempt to establish a phone patch with the nearest or controlling C2 Center using global HF network, UHF/VHF stations, SATCOM, etc. If unable, aircrews are permitted to use ARINC radio service as an additional avenue for phone patch connectivity.

6.38.2.3. Provide the following information when time permits:

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

6.38.2.3.2. What assistance is being requested.

6.38.2.3.3. Fuel on board and hours of endurance.

6.38.2.3.4. Position.

6.38.2.3.5. Altitude and flight conditions.

6.38.2.3.6. Number of personnel and DVs on board.

6.38.2.3.7. Qualification of all primary crewmembers.

6.38.2.3.8. Planned landing destination and ETA.

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

6.40. Weather Forecasts. It is the pilot's responsibility to obtain destination weather prior to descent. The primary sources are 618 TACC weather operations (for 618 TACC flight-managed sorties), OWSs, and USAF weather flights via pilot-to-meteorologist service (PMSV) or through a USAF aeronautical station. For aircraft flying in EUCOM AOR (ENAME operations) contact USAFE/OWS at Sembach AB GE. SOUTHCOM AOR contact 25 OWS at Davis-Monthan AFB, AZ. The ATC system can provide weather information to en route aircraft.

Section 6F—Arrival

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

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

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

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

6.42. Instrument Approach Procedures.

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

6.42.2. Prior to starting an instrument approach, pilots will confirm their aircraft can comply with the missed approach climb gradient requirements established in AFI 11-202V3.

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

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

6.42.3.1.1. For PAR approaches, visibility will be no lower than RVR 2400 (730 meters) or 1/2 mile visibility (800 meters) with no RVR readout available.

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

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

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

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

6.42.4. Flight Instrumentation Requirements.

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

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

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

6.42.5. Category I ILS Procedures.

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

6.42.5.1.1. Two operational VHF communication radios are required.

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

6.42.5.1.3. If unable to accept an ILS PRM approach clearance, contact the FAA ATCSCC at 1-800-333-4286 prior to departure time to obtain a pre-coordinated arrival time. Pilots who arrive at a PRM airport unable to accept PRM approach clearance, who did not contact ATC prior to departure, should expect an ATC directed divert to a non-PRM airport.

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

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

6.42.6. Aircrews are not authorized to fly RNAV(RNP), RNAV, RNAV (GPS); GPS; or "OR GPS" approaches until aircraft equipment is certified, aircrews are trained, and MAJCOM/A3 has issued operational approval.

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

6.42.8. Not Used.

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

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

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

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

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

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

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

6.43. NVG Approach and Landing.

6.43.1. NVG Approach Weather Minimums. Weather minimums for NVG visual approaches, NVG visual pattern work, and crewmembers who are non-current and/or unqualified is 1500/3. Current and qualified NVG aircrews may fly IFR approaches which transition to NVG landings with weather 300/1 or approach minimums (whichever is higher). Crews must give careful consideration to the potential hazards during these critical phases of flight. Other weather limitations are IAW this instruction and AFI 11-202V3. ***NOTE:*** NVGs have inherent limitations which can further be reduced by poor weather conditions. Crews will consider weather conditions, moon illumination and position, sky glow at dawn and dusk, cultural lighting, and weapon/expendable effects when planning NVG operations.

6.43.2. NVG Malfunction during Approach and Landing. If one of the pilots experience NVG failure on short final, it will be at the discretion of the PIC whether or not to transition to normal lights or perform a go-around. If the PF's NVGs fail after touchdown, transfer control to the PM for the landing rollout. Use normal lights for illumination until both pilots are ready to resume NVG operations. The PM will be ready to immediately assume aircraft control if the PF experiences spatial disorientation or an NVG malfunction. Pilots must exercise sound and conservative judgment to continue NVG operations with aircraft malfunctions.

6.44. Unscheduled Landings. When an unscheduled landing or crew rest occurs at a base without a passenger facility, the PIC should immediately advise the appropriate C2 agency and request assistance in arranging substitute airlift for passengers on board. The following procedures apply when obtaining support for service members, in a group travel status, who are

transported on AMC organic aircraft flying a Transportation Working Capital Fund (TWCF) mission, which incur an unscheduled delay due to weather or maintenance problems, forcing the members to be lodged at that location until the aircraft can continue its mission.

6.44.1. If the delay is at a location where DOD facilities and AMC TWCF funds are available, payment for lodging (contract or on-base) will be made by the local accounting liaison/OPLOC citing TWCF funds. The appropriate TWCF fund cite may be obtained from the local financial analysis and/or accounting liaison office. Normally, a BPA contract or AF IMT 616, *Fund Cite Authorization* is already established at these locations to charge the routine lodging costs for transient or TDY individuals who are on TWCF funded travel orders.

6.44.2. If the delay is at a location where DOD facilities are available and AMC TWCF funds are not available, the PIC will utilize AF IMT 15, **United States Air Force Invoice** authority to acquire the appropriate lodging accommodations. Upon return to home station, the PIC will send the AF IMT 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts). When the AF IMT 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed.

6.44.3. If the delay is at a location where both DOD facilities and TWCF funds are unavailable, the PIC will utilize AF IMT 15 authority to acquire the appropriate meals, quarters, and transportation to support the service members. Upon return to home station, the PIC will send the AF IMT 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts). When the AF IMT 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed. ***NOTE:*** This policy does not apply to those passengers on delayed TWCF organic aircraft who are in a per diem or space available status, except for those duty passengers on TWCF funded travel orders delayed at locations where TWCF funds are available.

6.45. Maintenance. Complete the AFTO Forms 781 after each flight. After landing, crewmembers debrief maintenance personnel on the condition of the aircraft, engines, avionics equipment, and all installed special equipment as required. At stations without maintenance support, when a maintenance requirement exists the PIC will ensure a thorough debrief is provided to the C2 agency. On AMC missions, notify 618 TACC Logistics Control (618 TACC/XOCL).

6.45.1. An entry will be placed in AFTO 781A, "Aircraft Subjected to Salt Spray" (state lowest altitude and duration) anytime the aircraft is flown under 2000 feet above sea except for takeoffs and landings.

6.46. Border Clearance.

6.46.1. Normal Operations.

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

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

6.46.1.2.1. Crewmembers, troops, and passengers possess current passports and valid visas, when required.

6.46.1.2.2. Crewmembers, troops, and passengers have current certificates of immunization (shot record).

6.46.1.2.3. Cargo entry documents are in proper order.

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

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

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

6.46.2. Procedures for US Entry.

6.46.2.1. En route, the loadmaster will distribute personal customs declarations (when not accomplished by passenger services) to all passengers, troops, and crewmembers. The loadmaster will also brief passengers and crewmembers on customs regulations, and prepare and compile necessary border clearance forms for the PIC's signature.

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

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

6.46.2.4. When an aircraft lands for a US border clearance, a US Customs representative normally will meet the aircraft to obtain the required documents. Do not deplane passengers, troops, or crewmembers unless necessary for safety or the preservation of life and property (loadmaster excepted). Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all landings required when operating on a permit to proceed or until all crew, passengers, and cargo complete final border clearance.

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

6.46.3.1. Follow USAF policy on status of military aircraft as stated in the FCG, *General Information* (Chapter 3). In substance, this policy holds that US military aircraft are immune from searches, seizures, and inspections (including customs and safety inspections) by foreign officials. In addition, PICs must be aware of, and adhere to, any specific FCG provisions for individual countries.

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

6.46.3.2.1. In most cases, search attempts may be halted simply by a statement of the PIC to the foreign official that the aircraft is a sovereign instrumentality not subject to search without consent of USAF headquarters or the US Department of State officials in the country concerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities that may honestly, but mistakenly, believe they have authority to search USAF aircraft.

6.46.3.2.2. If foreign authorities insist on conducting a search, the PIC should make every effort to delay the search until he or she can contact USAF headquarters (through MAJCOM C2) or the appropriate embassy officials. The PIC should then notify these agencies of foreign request by the most expeditious means available and follow their instructions.

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

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

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

6.46.4. Exercises and Contingency Operations.

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

6.46.4.2. Implementation. Implementation of the agreement is not automatic. Traffic and border clearing agencies implement all or part of the agreement as necessary for each operation. Inspection and clearance may be accomplished at the US on-load or off-load base, or at the foreign on-load or off-load base.

6.46.4.3. Customs Procedures.

6.46.4.3.1. Outbound: No requirement. Filing of Customs Form 7507, **General Declaration (Outward/Inward***)*, is not required unless directed.

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

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

6.46.4.3.2.2. Cargo manifest.

6.46.4.3.2.3. For troops out of country less than 140 days:

6.46.4.3.2.3.1. Troop commander's certificate for examination of troop baggage.

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

6.46.4.3.2.3.3. Upon arrival at a CONUS offload base, a customs representative will meet the aircraft and accept the troop commander's certificate with respect to troop baggage. Individual baggage declarations are not required. The troop commander should have inspected troop baggage.

6.46.4.3.2.3.4. Troops will debark under the observation of the customs representative with only a spot check of articles and baggage. The customs officer may elect to make a more extensive inspection.

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

6.46.4.3.2.4.1. One copy of the U.S. Customs Baggage Declaration Form for each passenger. This includes observers, support personnel, civilians, news media personnel, and crewmembers. Personnel may use DD 1854, **Customs Accompanied Baggage**, US, or Customs Form 6059B.

6.46.4.3.2.4.2. Upon arrival at a CONUS offload base, a customs representative will meet the aircraft and collect all declarations. Troops will debark under the observation of the customs representative who may make discretionary examination of the baggage.

6.46.4.4. Public Health Procedures.

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

6.46.4.4.2. Spray the aircraft if required.

6.46.4.5. Immigration Procedures.

6.46.4.5.1. Outbound: No requirements.

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

6.46.4.5.2.1. One copy of Customs Form 7507 (found at **http://www.customs.gov**).

6.46.4.6. Agriculture Procedures:

6.46.4.6.1. Outbound: No requirement.

6.46.4.6.2. Inbound: Consult AMC Border Clearance Guide.

6.46.4.6.2.1. The command being airlifted will instruct troops that no fresh fruit, milk, milk products, vegetables, plants, plant pests, soil samples, animals, meat, and animal products can be brought into the United States. All items of troop personal gear/cargo are to be thoroughly cleaned of mud, dirt, sand, and other foreign material before being brought aboard the aircraft. Personal gear and equipment must be examined for snails and other plant pests to prevent their accidental entry into the U.S.

6.46.4.6.2.2. 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.

6.46.4.6.2.3. When required by agricultural quarantine regulations, the FCG, or higher headquarters, the aircraft will receive an aerosol treatment 30 minutes before landing.

6.46.4.6.2.4. On arrival, agricultural inspectors will inspect the aircraft after troops have disembarked. Crewmembers will assemble remains of in-flight lunches for prompt removal by fleet service personnel.

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

6.46.5. Military Customs Pre-clearance Inspection Program. All crewmembers will ensure compliance with Military Customs Pre-clearance requirements.

6.47. Insect and Pest Control.

6.47.1. Responsibility. PICs will ensure required spraying is accomplished according to AFJI 48-104, *Medical and Agricultural Foreign and Domestic Quarantine Regulations for Vessels, Aircraft, and Other Transports of the Armed Forces (Joint)*, Department of Defense FCG, or as directed by higher headquarters. Certify the spraying on Customs Form 7507, or on forms provided by the country transited. Aircraft should never be sprayed with passengers on board. The only exception is when mandated by the FCG.

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

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

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

6.47.1.1.3. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is aboard and after closing all doors, windows, hatches, and ventilation openings. ***CAUTION:*** If the insecticide label directs disembarkation after

use, spray before boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

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

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

6.47.3. Procedure at Aerial Port of Debarkation (APOD). On arrival at an APOD, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation. Do not on-load or off-load cargo or passengers 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 or the local C2 organization.

Section 6G—Miscellaneous

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

6.48. (934AW)Dropped Objects. If a dropped object occurs at home station, the aircraft commander will inform the SOF of the situation and fill out an AMC IMT 97, *AMC In-flight Emergency and Unusual Occurrence Worksheet* upon landing.

6.48.1. Notify 618 TACC or the controlling agency as soon as practical; include details of routing, altitude, weather, etc.

6.48.2. Notify maintenance at the first military station transited.

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

6.50. Aircrew Life Support and Dash 21 Equipment Documentation. The PIC or designated representative will:

6.50.1. Before departing home station or en route stations, ensure appropriate serviceable protective clothing, and dash 21 equipment for the entire or remainder of the mission are aboard the aircraft.

6.50.1.1. Restricted Aircraft LSE Configuration. Aircraft that are operating under restrictions due to center wing box cracks may have the following equipment removed on local training missions. Any removed equipment must be placed back onboard the aircraft before departing home station for a scheduled mission that may require the equipment. The following equipment may be removed at unit discretion:

6.50.1.1.1. Flash blindness goggles, MIL-G-635.

6.50.1.1.2. Three (3) 20-person life rafts (F-2B).

6.50.1.1.3. Adult/Child life preservers (A/C). (one LPU per passenger will be onboard for any flight over water carrying passengers.)

6.50.1.1.4. LPU-6/P life preservers (Infant cot). (one LPU per infant will be onboard for any flight over water carrying infants.)

6.50.1.1.5. LPU-2/P or -10/P life preservers. (one LPU per crew member will be onboard for any flight over water.)

6.50.1.1.6. ML-4 survival kits.

6.50.1.1.7. All survival vests except one.

6.50.1.1.8. Body armor.

6.50.1.1.9. CWU-16/P Anti-exposure suits.

6.50.1.1.10. Passenger demonstration kit. (place demonstration kit onboard as required.)

6.50.1.1.11. EPOS. One EPOS will be onboard per person whenever personnel other than crew members are carried. Pok's will be carried as required.

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

6.50.3. Before departing home station and following en route crew changes, the PIC will ensure all prepositioned aircrew life support and survival equipment items are serviceable, inventoried, and certified (sign and date) on the AFTO Forms 46, *Prepositioned Life Support Equipment* (or equivalent), prior to flight or alert. Notify the aircrew life support section of any onboard equipment shortages or unserviceable conditions.

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

6.50.4.1. Make an AFTO Forms 781A , *Maintenance Discrepancy and Work Document* entry for aircraft or life support equipment discovered missing. Additionally, document in the AFTO Forms 781A, equipment removed from the aircraft at an en route station.

6.50.4.2. Annotate missing dash 21 equipment on the AF Forms 4076 in the next vacant column indicating the quantity remaining for the item. Enter the ICAO location designator above the check number of that column. Leave AF Forms 4076 on board the aircraft in the event of an en route crew change.

6.50.4.3. Annotate missing aircrew life support equipment on the AFTO Forms 46 (or equivalent). Entries will include as much information as possible to assist aircrew life support in locating and recovering aircrew life support equipment (i.e., station where discovered missing, names, agencies and persons contacted, etc.).

6.50.4.4. Ensure all aircrew life support equipment items to include, survival kits, life preservers, anti-exposure suits, emergency passenger oxygen system (EPOS), and parachutes are returned to their proper storage location on the aircraft.

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

6.50.4.6. Reports of survey will be initiated IAW AFMAN 23-220, *Reports of Survey for Air Force Property*.

6.50.4.7. When possible, advise appropriate C2 agency (or airport management) before mission continuation.

6.50.5. Additional Equipment. If more equipment is discovered during the preflight than is annotated on the AF Forms 4076, annotate the actual quantity in the next vacant column for the item. Ensure the ICAO location designator is entered above the check number of that column. Annotate the AFTO Forms 46 (or equivalent) actual quantity in the remarks block.

6.51. Passenger Restrictions.

6.51.1. No-show passenger baggage or baggage of passengers removed from flight will be downloaded prior to departure. See exception at **paragraph 13.4.2.6**.

6.52. Airfield Data Reports. Aircrews transiting unfamiliar airfields or airfields where conditions may adversely affect subsequent flight will:

6.52.1. Report airfield characteristics that produce illusions, such as runway length, width, slope, and lighting, as compared to standard runways, sloping approach terrain, runway contrast against surrounding terrain, haze, glare, and previously unknown obstacles, airfield markings, or other safety critical items to HQ AMC/A36AS.

6.52.2. Debrief the next C2 center transited.

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

6.54. Cockpit Congestion and Loose Objects.

6.54.1. The maximum number of persons on the flight deck will be the minimum commensurate with the mission requirements. At no time should this exceed seven (unless otherwise specified in a MAJCOM supplement).

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

6.54.3. Place only soft items on the top bunk.

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

6.56. Overflying En Route Stops. The C2 agency may approve a request to overfly a scheduled en route stop (ANG/DOD for ANG-directed missions, AFRC command center for AFRC-directed missions).

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

6.57.1. After landing, taxi to the de-arm area or another suitable safe location to check for hung ordnance.

6.57.2. The loadmaster or another qualified crewmember will deplane the aircraft and check all chaff/flare dispensers for hung ordnance or damage. ***NOTE:*** ALE-47 flare squibs that fail to fire are not considered hung ordnance.

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

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

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

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

6.58.2. Material. Ensure COMSEC and other classified materials are turned in at destination and receipts are obtained for COMSEC and classified material. The on-site C2 center will provide temporary storage for COMSEC and other classified materials during en route, turnaround, and crew rest stops. If a storage facility is not available, the aircraft gun storage box may be used for material classified up to and including SECRET. Encrypted COMSEC will only be transferred to authorized DOD personnel.

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

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

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

6.58.6. Aircraft with inoperable Mode IV will continue to their intended destinations. Repairs will be accomplished at the first destination where equipment, parts, and maintenance technicians are available. In theaters where safe passage is implemented, aircraft will follow procedures for inoperable Mode 4 as directed in the applicable airspace control order or Air Tasking Order (ATO).

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

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

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance on aircraft security and preventing and resisting aircraft piracy (hijacking) of the C-130 aircraft. AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking),* AFI 31-101, *The Air Force Installation Security Program,* and specific MAJCOM security publications contain additional guidance. Aircrews will not release information concerning hijacking attempts or identify armed aircrew members or missions to the public.

7.2. Security. The C-130 is a "Protection Level 3" resource. Aircraft security at non-United States military installations is the responsibility of the controlling agency.

7.3. Air Force Installation Security Program. The following security procedures will implement AFI 31-101, requirements for C-130 aircraft:

7.3.1. The aircraft will be parked in an established restricted area and afforded protection via a two-person External Security Response Team, (ESRT) with response capability within 5 minutes.

7.3.2. When no permanent or established restricted area parking space is available, establish a temporary restricted area consisting of a raised rope barrier, and post with restricted area signs. Provide ESRT 5-minute response and the ISRT from existing areas can resopond to this area it able to maintain 3-minute response withing their primary area. Portable security lighting will be provided during the hours of darkness if sufficient permanent lighting is not available.

7.3.3. At non-United States military installations, the PIC determines the adequacy of local security capabilities to provide aircraft security commensurate with this chapter. If he or she determines security to be inadequate, the aircraft will depart to a station where adequate security is available.

7.3.4. The security force must be made aware of all visits to the aircraft. The security force POC must be identified to the PIC.

7.3.5. Security support is a continual requirement and is not negated by the presence of aircrew or ground crew members. Security force support terminates only after the aircraft doors are closed and the aircraft taxis.

7.3.6. Locking and Sealing. Lock or seal the aircraft during a "Remain over night" (RON) on non-secure ramps (see **paragraph 7.6**).

7.4. Standby Aircraft Security. Ensure aircraft hatches and doors are secure to show unauthorized entry; seal the crew entrance door with a box car seal, or other controllable device, which will prevent entry without damaging the door or lock. The PIC shall notify the C2 agency the aircraft is sealed and provide them a means to access the aircraft in an emergency. Annotate the forms with the time the aircraft was sealed. The C2 Senior Controller may grant access to a sealed aircraft, shall document time of entry and ensure it remains launch capable. The PIC or designated representative must be present if access to the aircraft is required and will ensure the aircraft is resealed. The aircrew pre-flight portion will remain valid if performed by one aircrew,

sealed, and flown by another aircrew. ***NOTE:*** WG/CCs should develop local procedures for documentation and management IAW TO 00-20-1 and MAJCOM Supplement.

7.5. En Route Security. The planning agency must coordinate with the execution agency to ensure adequate en route security is available. The PIC will receive a threat assessment and en route security capability evaluation briefing for areas of intended operation prior to home station departure and should request updates from en route C2 as required. If required, a PHOENIX RAVEN team will be assigned to the mission.

7.5.1. The PHOENIX RAVEN team will consist of at least two US Air Force security force members, but may include more depending on security requirements. The team's travel status is determined by MAJCOM (usually MEP status) and is responsible to the PIC at all times. In turn, the PIC is responsible for their welfare (transportation, lodging, etc.). Ensure security team members receive a mission briefing, aircraft egress/passenger briefing (as appropriate).

7.5.2. Arrival. On arrival, the PIC will assess the local situation and take the following actions as required:

7.5.2.1. Area patrol. Request area security patrols from local security forces. If local authorities request payment for this service, use AF IMT 15.

7.5.2.2. Aircrew surveillance. During short ground times, direct armed crew members to remain with the aircraft and maintain surveillance of aircraft entrances and activities in the aircraft vicinity.

7.5.2.3. Inadequate Security. If, in the opinion of the PIC, airfield security is inadequate and the PIC determines the safety of the aircraft is in question, the PIC may waive the FDP limits and crew rest requirements and depart as soon as possible for a base considered reliable. Report movement and intentions to the controlling agency as soon as practical. If a departure is not possible, the aircrew must secure the aircraft to the best of their ability. In no case, will the entire crew leave the aircraft unattended. Crew rest requirements will be subordinate to aircraft security when the airframe may be at risk. The PIC should rotate a security detail among the crew to provide for both aircraft protection and crew rest until relief is available. Request security assistance from the nearest DOD installation, US Embassy, local military or law enforcement agencies as appropriate.

7.5.3. Entry Control Procedures. Unescorted entry is granted to aircrew members and support personnel assigned to the mission who possess their home station AF Form 1199, **Air Force Entry Control Card**, supported by an Entry Access List (EAL) or aircrew orders. Aircrew members and assigned crew chiefs are authorized escort authority.

7.5.3.1. Normally, non-United States nationals, such as cargo handlers, can perform their duties under escort and should not be placed on the EAL.

7.5.3.2. Personnel not on the EAL or aircrew orders must be escorted within the area.

7.6. Detecting Unauthorized Entry.

7.6.1. When parking on a secure ramp, the aircraft will normally be left unlocked/unsealed to allow ground personnel immediate access. If, in the PIC judgment, the aircraft needs to be locked and sealed in order to detect unauthorized entry, then:

7.6.1.1. Use available aircraft ground security locking devices.

7.6.1.2. Secure the doors in a manner that will indicate unauthorized entry (e.g., tape inside of doors to airframe so that entry pulls tape loose).

7.6.1.3. Close and seal the crew entrance door (box car seal).

7.6.1.4. Wipe the immediate area around lock and latches clean to aid in investigation of a forced entry.

7.6.1.5. Report any unauthorized entry or tampering to the Office of Special Investigation (OSI), security forces or local authorities, and the C2 agency. Have aircraft thoroughly inspected prior to flight.

7.6.2. Security awareness is crucial to effective mission accomplishment. Aircrews must always remain vigilant to their surroundings, especially at high threat, low security locations. In addition to normal preflight activities, aircrews must inspect areas of the aircraft not covered by normal preflight duties, to include: inside main landing gear pods, and crew/troop O2 service panels, for personnel or other unfamiliar devices.. Report any suspicious items to host security forces. Aircrews will maintain a heightened security posture throughout all pre-takeoff activities.

7.7. Preventing and Resisting Hijacking.

7.7.1. 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.

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

7.7.3. 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 FAA, and where appropriate, the Federal Bureau of Investigation (FBI) with all pertinent information. Where possible, the FAA will consult and cooperate with DOD prior to directing any law enforcement activity.

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

7.7.5. 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.

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

7.7.7. Since air piracy may be committed by political terrorists or by individuals to whom the threat of death is not a deterrent but a stimulus, 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.

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

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

7.8. Preventive Measures. Commanders at all levels must ensure preventive measures are taken to minimize access to the aircraft by potential hijackers. When a C-130 is operating away from home station, the PIC will comply with this chapter and AFI 13-207, as supplemented.

7.8.1. Preventive measures include the following: The host station passenger processing or manifesting facility should conduct anti-hijacking inspections. Do not board passengers until the PIC is fully satisfied with inspection results. In the absence of qualified passenger service representatives, the PIC will ensure the anti-hijacking inspection of passengers and baggage is accomplished.

7.8.1.1. The Transportation Security Administration provides the latest guidance on passenger screening and carry-on allowances. The latest guidance can be downloaded from **www.tsa.gov/press/happenings/index.shtm**

7.8.1.1.1. Aircrew must ensure thorough screenings are accomplished when processing passengers at locations without an AMC Passenger Terminal.

7.8.1.1.2. Carry-on restrictions apply to all passengers required to process through the passenger terminal, or equivalent when at a non-AMC location. Carry-on restrictions do not apply to personnel not required to process through the passenger terminal, or equivalent when at a non-AMC locations. This includes:

7.8.1.1.2.1. Aircrew members listed on the Flight Authorization for that mission.

7.8.1.1.2.2. MEPs for that mission.

7.8.1.1.2.3. OSA/VIPSAM passenger not required to process through the Passenger Terminal (primary DV, spouses/party, aides, and security details only).

7.8.1.1.2.4. Duty passengers on ANG/AFRC mission numbers.

7.8.1.1.3. Consider baggage contained in areas not readily accessible in flight as checked baggage, even if carried to the aircraft by the passengers. This includes, but is not limited to segregated baggage compartments, floor loaded baggage tied down with cargo straps/chains, palletized baggage, and baggage in baggage bins.

7.8.1.1.4. Brief passengers, required to process through the passenger terminal, or equivalent when at a non-AMC location, that baggage in these areas will not be accessed in flight. If these passengers attempt to access checked baggage in-flight, all attempts shall be made to stop the passengers from accessing the baggage. Land the aircraft at the nearest suitable airport (preferably a military facility) with appropriate law enforcement personnel if needed. Request assistance in removing the passenger(s) and accompanying baggage from the aircraft. Comply with all law enforcement direction.

7.8.2. Medical facility commanders are responsible for anti-hijacking inspection of patients. When patients are delivered to the aircraft by civilian sources, the aircrew will perform required inspections prior to loading.

7.8.2.1. For aeromedical evacuation (AE) missions, the Medical Crew Director (MCD) is the final authority for determining what medical items can be carried by/for AE patients.

7.8.3. During exercises or contingencies in support of combat operations involving the movement of large groups of personnel, the unit being supported should manifest passengers and perform anti-hijacking inspections.

7.8.4. Passengers will not carry weapons or ammunition on their person or in hand-carried baggage aboard an aircraft. ***EXECPTION:*** Special agents, guards of the Secret Service or State Department, RAVEN Team Members, and other individuals specifically authorized to carry weapons.

7.8.4.1. Troops or deadhead crewmembers will not retain custody of ammunition on an aircraft. They will turn it in to the troop commander or PIC. Troops may carry unloaded weapons and ammunition aboard the aircraft during combat operations. When the tactical situation dictates (in coordination with the aircrew), weapons may be loaded at the order of the troop commander or team leader.

7.8.4.2. Dummy clips that can be easily identified may be loaded for training at the order of the team leader in coordination with the aircrew.

7.8.4.3. RAVENs will only be armed in-flight on specifically designated missions identified on the mission "frag" as a "RAVEN in-flight arming required."

7.8.5. If weapons must be cleared, instruct the individual(s) to:

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

7.8.5.2. Clear weapons in accordance with standard safety procedures. Ensure troop/aircraft commander retains ammunition IAW **paragraph 7.8.4.1**.

7.9. 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.

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

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

7.9.1.2. 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:

7.9.1.2.1. MAJCOM commander exercising operational control of the aircraft.

7.9.1.2.2. MAJCOM commanders in whose AOR the airfield lies.

7.9.1.2.3. Senior operational commander on scene.

7.9.1.2.4. PIC in compliance with MAJCOM directives.

7.9.2. A hijacked aircraft carrying weapons of mass destruction will not be allowed to takeoff. Refer to DOD 5210.41M, paragraph 9B(3), for additional guidance.

7.10. 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:

7.10.1. Engage the hijacker(s) in conversation in an attempt to calm them and to evaluate what course of action might be effective.

7.10.2. Dissuade the hijacker.

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

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

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

7.10.6. In any suspected or actual hijack attempt, the aircrew basic objective is to get the aircraft on the ground as quickly as possible and keep it there.

7.11. Communications between Aircrew and Ground Agencies. Crews facing a hijacking threat will transmit an in-the-clear notification of hijacking to ATC. Notify ground agencies as soon as practical and follow-up with situation reports as circumstances permit.

7.11.1. In the event of Hijack, the aircrew should communicate or respond to routine ATC transmission in clear, plain English, and squawk code 7500 or verbally indicate the selection of 7500. Once the pilot squawks code 7500, or verbally indicates the selection, the controllers will assign IFF code 7500. The pilot will not reset the Transponder to 7700 to signify additional urgency. Code 7500 for hijacking already signifies the highest level of urgency.

7.11.2. DELETED.

7.11.3. DELETED.

7.11.4. DELETED.

7.11.4.1. DELETED.

7.11.4.2. DELETED.

7.11.5. DELETED.

7.11.6. DELETED.

7.12. Forced Penetration of Unfriendly Airspace. Refer to FIH for international signals for air intercept.

7.13. Arming of Crew Members. When crews are directed to carry weapons, at least one flight engineer and one loadmaster will be armed. All crew members should know who is armed. The following procedures apply when arming is directed:

7.13.1. Weapons Issue. Before departing home station, obtain weapons, ammunition, box, lock and key. Crew members will be armed according to AFI 31-207, *Arming And Use of Force by Air Force Personnel* and MAJCOM publications. If an armed crew member must leave the crew en route, transfer the weapon to another authorized crew member using AF IMT 1297, **Temporary Issue Receipt**.

7.13.1. **(934AW)** Missions requiring weapons will be communicated to aircrew members through the PEX schedule, flight authorization and/or the crew schedulers. When an aircrew member is required to carry weapons on a flight, they will follow the procedures and guidelines outlined in the 934 OG OI 31-103, Issue and Courtesy Storage of Aircrew Weapons.

7.13.2. Wearing of Weapons. Wear weapons in a holster, concealed at all times to prevent identifying armed crew members. Do not wear weapons off the flight line except to and from the C2, armories, and other facilities associated with aircrew activities.

7.13.2.1. AMC Passenger Terminal Procedures. Armed crewmembers must discreetly identify themselves to AMC passenger service personnel upon arrival at security checkpoints. One crewmember will present a valid set of crew orders, military identification card, and AF Form 523, **USAF Authorization to Bear Firearms,** authorizing the carrying of concealed weapons. Once terminal personnel verify this, they will allow the crewmember to vouch for the remaining crewmembers. The entire crew will then proceed through the magnetometer without removing objects from their pockets. This will prevent passengers from determining which crewmembers are armed.

7.13.3. Weapons Storage In-Flight. Crew members will be armed before beginning preflight, on-load or off-load duties and until completion of all post-flight duties. When no passengers are aboard, weapons may be stored in the gun box in-flight after a satisfactory stowaway check. Crew members will rearm before landing. Weapons need not be unloaded before placing them in a gun box.

7.13.4. Weapons Storage on the Ground.

7.13.4.1. Aircrews, including stage crews, will store weapons and ammunition in the most secure facility available, normally the base armory.

7.13.4.2. Non-stage aircrews may store weapons and ammunition in the aircraft gun box.

7.13.5. When storing weapons in the gun box:

7.13.5.1. Weapons should normally not be unloaded.

7.13.5.2. Inform C2 which crew member has the gun box key.

7.13.6. Crew members will ensure they are reissued the same weapon until mission termination at home station.

7.13.7. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels if available. Do not use a hand-to-hand transfer of loaded weapons to another crew member; place the weapon on a flat surface.

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

Chapter 8

OPERATIONAL REPORTS AND FORMS

8.1. General. This chapter provides guidelines for worksheets, reports, and forms associated with AMC operational activities. Consult governing instruction or contact wing, unit, or local flight safety officers for assistance with safety forms.

8.2. AF IMT 457, USAF Hazard Report. The AF IMT 457 is a tool to notify supervisors and commanders of a hazardous condition that requires prompt corrective action. For hazardous weather, complete the front side of an AF IMT 457 and send it to the parent wing flying safety office. If addressing a Computer Flight Plan deficiency, attach a copy of the AF IMT 72, **Air Report (AIREP).** Send your report so the parent unit receives it within 5 days of the event. For more information, see AFI 91-202, *The Air Force Mishap Prevention Program.*

8.3. AF IMT 651, Hazardous Air Traffic Report. The AF IMT 651 is a tool to report near midair collisions and alleged hazardous air traffic conditions.

8.3.1. AFI 91-204, *Safety Investigations and Reports* and AFMAN 91-223, *Aviation Safety Investigations and Reports* list HATR reportable incidents.

8.3.2. The PIC shall report the hazardous condition to the nearest ATC agency (e.g. center, Flight Service Station (FSS), control tower, or aeronautical radio station) as quickly as safety allows. Include the following information in the radio call (as appropriate)

8.3.2.1. Aircraft identification or call sign.

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

8.3.2.3. Altitude or flight level.

8.3.2.4. Description of the other aircraft or vehicle.

8.3.2.5. Advise controlling ATC agency that the PIC will file a HATR upon landing.

8.3.3. Deadline to file a HATR is 24 hours after event via any communication mode available. If landing airport has a USAF airfield management function, submit completed AF IMT 651 to the airfield mamagement officer for forwarding to the wing safety office. If landing airport does not have an airfield mamagement office, notify the safety office of the Air Force base nearest to location where the condition occurred, PIC's home base safety office, or as prescribed by overseas MAJCOM. In that case, provide contact sufficient information to prepare AF IMT 651.

8.3.3. **(934AW)** All flight safety hazards will be reported on the AF IMT 651, *Hazardous Air Traffic Report (HATR).* A copy of the written report will be filed with the SOF for processing.

8.3.4. Grant individuals who submit a HATR immunity from disciplinary action provided:

8.3.4.1. If they were the offending party, their violation was not deliberate.

8.3.4.2. They committed no criminal offense.

8.3.4.3. Their actions did not result in a mishap.

8.3.4.4. They properly reported the incident using procedures above.

8.4. AMC IMT 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet. The AMC IMT 97 is a tool to notify appropriate authorities of any mishap involving crewmembers or aircraft. PICs shall complete all appropriate areas of the form in as much detail as possible. When notified, AMC C2 agents will inform their supervisor/commander to start investigation and reporting activities IAW AFI 91-204, *Safety Investigations and Reports*, and Operation Report 3 (OPREP-3) procedures.

8.4. (934AW)All emergency situations. All emergency situations will be reported on the AMC IMT 97. The aircraft commander will file this written report with the SOF for processing.

8.4.1. PICs will report crewmember or passenger injury, aircraft damage, or injury/damage to another organization's people or equipment caused by PIC's aircraft/crewmember. At a minimum, report the following:

8.4.1.1. Any physiological episode (physiological reaction, near accident, or hazard in-flight due to medical or physiological reasons). These include:

8.4.1.1.1. Proven or suspected case(s) of hypoxia.

8.4.1.1.2. Carbon monoxide poisoning or other toxic exposure.

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

8.4.1.1.4. Hyperventilation.

8.4.1.1.5. Spatial disorientation or distraction that results in an unusual attitude.

8.4.1.1.6. Loss of consciousness regardless of cause.

8.4.1.1.7. Death by natural causes of any crewmember during flight.

8.4.1.1.8. Unintentional loss of pressurization if cabin altitude is above FL180, regardless of effects on people on board.

8.4.1.1.9. Inappropriate use of alcohol and effects of hangover that affect in-flight duties (crewmembers only).

8.4.1.1.10. Illness (both acute and preexisting), including food poisoning, dehydration, myocardial infarction, seizure, and so forth.

8.4.1.1.11. Exposure to toxic, noxious, or irritating materials such as smoke, fumes, or liquids. ***NOTE:*** Crewmembers and passengers involved in a physiological episode will see a flight surgeon to report the Class E event via AFSAS as soon as practical.

8.4.1.2. A human factors related situation, e.g. misinterpretation of instruments; information overload (i.e. tactile, aural, and visual input too fast to permit reasonable analysis/decision); aircrew task saturation (i.e. too many responses/actions required in a short period of time); or confused switchology (i.e. adjacent switches where actuation of wrong switch creates dangerous situation). Anonymous reports are acceptable.

8.4.1.3. A condition that required engine shutdown, in-flight flameout, engine failure, suspected engine power loss, or loss of thrust that required descent below MEA. Engine

failures include, but are not limited to, shrapnel from a failed internal engine component penetrating the engine case, engine case rupture/burn-through, engine nacelle fire, substantial fuel leak, or unselected thrust reversal. Consistent with safety, immediately report incidents that involve multiple engines (may report single-engine incidents upon landing). ***NOTE:*** Exclude intentional shutdowns for training and/or FCF unless the engine fails to restart.

8.4.1.4. A flight control malfunction (including the autopilot and trim systems) that results in an unexpected or hazardous change of flight attitude, altitude, or heading. Enter the flag words, "Reportable Flight Control Malfunction" in the AFTO 781A, Maintenance Discrepancy and Work Document write up.

8.4.1.5. A landing gear malfunction aggravated by failed emergency system or procedures.

8.4.1.6. A cargo door, ramp or other door malfunction when intent for flight exists which could affect system integrity.

8.4.1.7. An in-flight loss of all pitot-static or gyro-stabilized attitude/directional instrument indications.

8.4.1.8. Any spillage/leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo.

8.4.1.9. Conditions that required pilot to depart takeoff or landing surface.

8.4.1.10. All in-flight fires regardless of damage.

8.4.1.11. All bird strikes regardless of damage.

8.4.1.12. Incidents that, in the PIC's judgment, are in the interest of flight safety.

8.4.2. Always provide your home station safety officer a copy of relevant information. Make every effort to preserve all mission and flight related documents, such as flight plans, weather briefings, NOTAMS, Weight and Balance form, etc., for collection by appropriate safety officials. PICs shall use the following precedence to report mishaps (as soon as feasible after event):

8.4.2.1. MAJCOM flight safety officer (FSO).

8.4.2.2. Any FSO.

8.4.2.3. The nearest USAF C2 center.

8.4.2.4. Any USAF base Airfield Management Operations.

8.5. Report Violations, Unusual Events, or Circumstances. PICs shall document events that require them to deviate from AFI 11-202V3 (unless waived by competent authority) or alleged navigation errors (include over-water position errors over 24NMs, border, or ATC violations).

8.5.1. Describe deviation(s) using the following report format:

8.5.1.1. Facts. Report pertinent details of the event.

8.5.1.2. Investigation and analysis. Report circumstances which required/drove deviation(s).

8.5.1.3. Findings and conclusions.

8.5.1.4. Recommendations to prevent recurrence.

8.5.1.5. Corrective actions taken.

8.5.2. Include the following attachments with the report:

8.5.2.1. Formal notification of incident.

8.5.2.2. AMC IMT 41 or approved crew orders.

8.5.2.3. Crewmembers' official statements (if applicable).

8.5.2.4. Other pertinent documents submitted in evidence (logs, charts, etc.).

8.5.3. In addition to above (when aircraft is equipped), PIC shall download original flight plan to a floppy disk and turn it in to the C2 center or parent standardization and evaluation office.

8.5.4. OG/CC shall send the original investigation report to the appropriate MAJCOM within 45 days of the event/notification. ANG/AFRC OG/CCs shall send original investigation report through channels to HQ AFRC/IGI within 35 days of the event/notification. HQ AFRC/IGI will send the investigation report to MAJCOM within 45 days of event/notification.

8.5.5. Use OPREP-3 reporting procedures contained in AFI 10-206, for navigation errors over 24 NMs.

8.5.5.1. When notified of a navigation position error, the PIC (or agency that receives initial notification) shall document the circumstances surrounding the incident (using report format below) and ensure C2 agents submit an OPREP-3.

8.5.5.2. Include the following information in the report:

8.5.5.3. The name and location of agency/unit submitting report.

8.5.5.4. Affected mission identification number.

8.5.5.5. Reference OPREPs-3 to determine type of event (i.e., state "navigation position error.").

8.5.5.6. The date, time (Zulu), and location (e.g., ARTCC area) of alleged infraction.

8.5.5.7. Describe facts and circumstances. Include aircraft type and tail number, unit (aircrew's wing or squadron), home base, route of flight, point of alleged deviation, and miles off course.

8.5.6. PICs shall expeditiously report unusual events/circumstances that impact their mission to appropriate MAJCOM agencies. Reportable events include, but are not limited to, spectrum interference, interception, fuel dumping, multiple engine failure, hostile fire, injury to passenger or aircrew member, etc. This list is not all exhaustive. Most events require C2 agents to forward OPREP reports to higher headquarters. In all cases, pass the "who, what, when, where, why and how" of the incident to a C2 agency.

8.5.6.1. The Spectrum Interference Resolution Program, covered in AFI 10-707, *Spectrum Interference Resolution Program*, establishes procedures to combat the effect

of meaconing, intrusion, jamming, and interference. PICs who encounter EMI will report the event to the nearest C2 agency as soon as practical.

8.5.6.1.1. Address EMI reports to: HQ AMC SCOTT AFB IL//A63// and addressees listed in AFI 10-707. Send reports via electronic message format with the following information in plain text:

8.5.6.1.1.1. Frequency selected when EMI occurred.

8.5.6.1.1.2. Equipment affected by EMI. Location of the system. The system function, name, nomenclature, manufacturer with model number or other system description. The operating mode of the system, if applicable (frequency agile, pulse doppler, search, etc.).

8.5.6.1.1.3. Description of EMI (noise, pulsed, continuous, intermittent, etc.).

8.5.6.1.1.4. Effect EMI had on system performance (reduced range, false targets, reduced intelligibility, data errors, etc.).

8.5.6.1.1.5. Date(s) and time(s) of EMI.

8.5.6.1.1.6. Location where EMI occurred (coordinates or line of bearing, if known, otherwise state as unknown.)

8.5.6.1.1.7. Source of the EMI if known.

8.5.6.1.1.8. List other units that received interference (if known) and their location or distance and bearing from your location.

8.5.6.1.1.9. A clear, concise narrative summary on what you know about the EMI, with any actions taken to resolve the problem.

8.5.6.1.1.10. Whether or not PIC wants expert/technical assistance (include level of security clearance expert requires).

8.5.6.1.1.11. Specify impact the EMI had on your mission.

8.5.6.1.1.12. Provide a POC (Name, Rank, DSN/Commercial Phone Number, and Duty hours).

8.5.6.1.2. C2 agents must prepare an OPREP-3 if EMI is suspected meaconing, intrusion, or jamming, interference sufficient to cause a hazard, or if, in the PIC's judgment, the situation warrants such a report.

8.5.6.1.3. PICs shall serve as classification authority for EMI reports. Evaluate an adversaries' ability to exploit certain systems using EMI and protect information accordingly. PICs on a non-sensitive mission or who judge the EMI to be interference from a non-hostile source need not classify EMI reports unless that report would reveal system vulnerability. Classify interference report(s) at stations located in combat areas or during sensitive military missions.

8.5.6.2. PICs will immediately report all uncoordinated aircraft interceptions to TACC via the most expeditious means available (UHF/VHF, AERO-I, HF, AOC, L-Band, etc), after complying with guidance in the Flight Information Handbook. Consideration will be given to phase of flight (i.e. descent/approach/ landing) and aircraft emergencies.

When an airborne report is not accomplished, PICs must directly notify TACC upon landing. In all cases, ensure local C2 and Intel agencies are informed.

8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation. This section prescribes aviation POL (AVPOL) procedures that ensure correct documentation, form and invoice processing, and program supervision. Reference DESC-I-31, *Purchase of Aviation Fuel and Services at Commercial Locations*. Use the Multi Service Corporation (MSC) air card for the purchase of aviation fuel and ancillary ground services at commercial airports (and some military installations) worldwide. The air card is authorized for use by all U.S. government aircraft, state, local law enforcement aircraft, and some foreign government aircraft. All PICs should plan to use the "platinum" MSC card. In most cases, there will be no changes when refueling at non-Defense Energy Support Center (DESC) contract locations. The MSC card is accepted at approximately 4,800 locations worldwide. A list of all MSC-accepting merchants can be found at **https://www.airseacard.com**. It replaces the Standard Forms (SF) 44, *Purchase Order-Invoice-Voucher*, at locations that accept the MSC card.

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

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

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

8.6.2.2. Foreign government air forces. ***NOTE:*** DOD FLIP en route supplements identify locations with into-plane contracts.

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

8.6.3. AVPOL Forms Documentation and Procedures.

8.6.3.1. **DD 1898, Fuels Sales Slip,** is the fuels transaction receipt used for purchases at other DOD locations, including DFSC into-plane contract locations. Log and place the DD1898 inside the AF IMT 644. The PIC or designated representative shall complete this form. ***NOTE:*** If the contractor insists on a unique invoice along with the DD 1898, annotate the vendor's invoice with "DUPLICATE DD1898 ACCOMPLISHED."

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

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

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

8.6.3.3.1.1. The aircrew shall present the SF 44 as the purchase invoice when an FBO refuses to accept the MSC card. The aircrew shall complete the SF 44 and attach it to the FBO vendor ticket/invoice when the FBO also declines use of the

SF 44 and uses its own invoice/receipt. Fuel purchases shall be documented on a separate SF 44 from ground services and other authorized products since the FBO must invoice DESC for the fuel and the customer for non-fuel product and services.

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

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

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

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

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

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

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

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

8.6.3.3.4. If the vendor presents their own form for signature and accepts the SF 44, write the statement "SF 44 Executed" on the vendor's form.

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

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

8.6.3.4. Purchasing Aviation Fuel in Canada. The DOD and Canadian Department of National Defense have signed a memorandum of understanding allowing DOD aircraft to use the DD1896, **Jet Fuel** Identaplate, when refueling at Canadian airfields with a Canadian National Defense Contract (CNDC). Use the AIR for fuel purchases at Canadian airports without a CNDC, and for ground handling services at all Canadian airports.

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

8.6.3.6. **AF Form 1994, Fuels Issue/Defuel Document,** records fuel purchases at USAF bases using a valid DD1896, Jet Fuel Identaplate. The PIC or designated representative shall complete the form then log and place a copy inside the AF IMT 664.

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

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

8.6.3.9. For off-station missions, the PIC will complete or verify accuracy of the AF FORMs 15, 664, AFTO Forms 781H, DD1898, and associated fuels receipts then place them in the AFTO Forms 664 (use eight digits for all USAF aircraft tail number entries). The PIC will transmit all AF Forms 664 information via phone, fax, or message if mission causes him/her to be off-station past the last day of the month

8.6.4. **(Added-934AW)** When purchasing fuel at a FBO, first choice of payment should be the AVIATION INTO-PLANE REIMBURSEMENT (AIR) CARD, located on the SPR panel. The secondary choice is the IDENTA-PLATE, located in the aircraft forms. The least preferred method should be the SF 44, *Purchase-Order-Invoice-Voucher*. If payment is made by either the AIRCARD or SF 44, receipt copies shall be given to the 96 AS Flight Engineer Scheduler by either the mission flight engineer or pilot upon return to home station.

8.6.5. **(Added-934AW)** Aircraft commanders will brief MEPs to save all FBO receipts and turn them over to the mission flight engineer. AFI 23-202 has been replaced with DESC-I-31 (PURCHASE OF AVIATION FUEL AND SERVICES AT COMMERCIAL LOCATIONS) which is contained in the mission kit. DESC-I-31 provides instructions for purchasing aviation fuel and services with the AVIATION INTO-PLANE REIMBURSEMENT (AIR)

CARD and the SF 44 from commercial locations. In addition, DESC-I-31 mandates the use of the SF 44 instead of AF IMT 315, *United States Air Force AVFuels Invoice* when purchasing fuel at commercial airport facilities that do not accept the AIR CARD.

8.7. Not Used.

8.8. AMC IMT 54, Aircraft Commander's Report on Services/Facilities. The AMC IMT 54 is a tool to report level of excellence for services encountered during mobility operations. Be quick to identify outstanding performers and attempt to resolve problems at lowest level practical. PICs should advise affected agency on their intent to submit an AMC IMT 54. Provide a copy of the completed form to local station AMC C2 agency. Upon return to home station, PICs will coordinate form with SQ/CC and OG/CC. For IMTs 54 that require AMC coordination, OG/CCs shall review and submit AMC IMT 54 to 18 AF/CC.

8.9. AMC IMT 196, Aircraft Commander's Report on Crew Member. The AMC IMT 196 is a tool to document an aircrew member or mission essential ground personnel's outstanding, below average, or unsatisfactory performance during a mobility mission. Be quick to identify outstanding performers and attempt to solve problems at lowest level practical (provide local senior leaders opportunity to resolve problems as they occur). Send the report to subject's unit commander.

8.10. AMC IMT 43, Transient Aircrew Facilities Report. The AMC IMT 43 is a tool to report level of excellence for transient facilities. Any crewmember may submit this report whether or not the PIC includes an unsatisfactory item in the trip report. Send completed AMC IMT 43 to HQ AMC/MWPS, or MAJCOM equivalent.

8.11. Not Used.

8.12. DD1748-2, Airdrop Malfunction Report (Personnel-Cargo). The DD1748-2 is used to document any airdrop malfunction IAW AFJI 13-210. Consistent with safety, immediately report off-Drop Zone (DZ) drops/extractions to the controlling agency and proper safety channels. PIC or designated representative shall complete the 1748-2 before entering crew rest.

EXCEPTION: If a malfunction is due to a failure of the static-line retriever or CDS remote timer system, the mission may be continued provided the 80 lb tie on the knife did not break, and the knife did not nick the gate. Use the opposite static line retriever and manually activate the retriever switch at FS 245 for three seconds or perform a manual gate cut. The DD 1748-2 is not required, but a write-up in the AFTO 781A is required.

8.12. (934AW)DD1748-2, *Airdrop Malfunction Report (Personnel-Cargo)*. In the event of an actual or suspected off-drop zone airdrop or airdrop malfunction, notify the 934 AW/CP, base operations or the SOF as soon as practical. If the mishap occurs in the local training area, the mishap aircraft will terminate the mission and return to MSP. Upon return to KMSP, the aircraft will be impounded by maintenance and security forces personnel. The aircraft commander, co-pilot, navigator, and loadmaster from the incident aircraft will provide individual written accounts to the SOF after landing. The aircraft commander will ensure all applicable reports are filed with the SOF for processing. For malfunctions, loadmasters will not de-rig the airdrop load. The Drop Zone Controller (DZC) will also provide written accounts of the DZ conditions and results of the drop.

8.13. AF IMT 4096, A irdrop/Tactical Airland/Air Refueling Mission Recap, SKE/ZM Debrief. The AF IMT 4096 is a tool to document details of airdrop, tactical airland, AR, or station keeping equipment SKE) missions. PIC or designated representative shall complete IMT 4096 (or command supplement) and submit same to home-station tactics office.

8.14. Operational Forms for Loadmasters. Detailed instructions on the preparation, distribution, and use of the following forms may be found in the governing directive (where noted).

8.14.1. **DD2131, Passenger Manifest (AMCI 24-101V14).**

8.14.2. **DD1385, Cargo Manifest (DOD 4500. 32R).**

8.14.3. **DD1854, US Customs Accompanied Baggage Declaration (DOD 5030. 49R).**

8.14.4. **DD1907, Signature and Talley Record (DOD 4500. 32R).**

8.14.5. **CF 6059B, US Customs Accompanied Baggage Declaration.**

8.14.6. **CF 7507, General Declaration (Outbound/Inbound) (AFI 24-401,402,403, and 404).**

8.14.7. **I-94, Immigration Form, Arrival/Departure Record (AFI 24-401,402,403,404).**

8.14.8. **AF IMT 4069, Tiedown Equipment Checklist.**

8.14.9. **AMC Form 148, Boarding Pass/Ticket/Receipt.**

8.14.10. **AF IMT 4075, Aircraft Load Data Worksheet.** Used for each leg of a cargo mission to keep track of each load and aid when calling in load information to the offload base.

Chapter 9

TRAINING POLICY

9.1. Passengers on Training Missions.

9.1.1. Passengers are not authorized during initial pilot qualification or pilot re-qualification training.

9.1.2. Mission qualification training, evaluations, off station trainers, and JA/ATTs may carry passengers only if the pilot in training has met Basic Aircraft Qualification requirements per AFI 11-2C-130 Volume 1, and any unqualified navigator, flight engineer, or load master is under the direct supervision of an instructor. Two loadmasters or one loadmaster and another qualified crewmember if more than 40 passengers are scheduled to be carried still applies.

9.1.2.1. If passengers are onboard, touch-and-go landings, stop-and-go landings, NVG training and airdrops are prohibited unless specifically authorization by the JA/ATT tasking order. (This does not apply to MEP.)

9.1.3. Multiple practice approaches will not be accomplished with passengers.

9.2. Touch-and-go Landing Limitations.

9.2.1. Touch-and-go landings will only be accomplished under the direct supervision of an IP or AC certified by unit command to perform touch-and-go landings. ACs will complete an in-flight evaluation prior to SQ/CC certification.

9.2.1.1. Ground idle touch-and-go landings may be performed by any pilot from either seat, when a flight examiner pilot, instructor pilot, or an instructor pilot candidate during upgrade training/evaluation occupies a pilot's seat.

9.2.2. Limitations.

9.2.2.1. Comply with all flight manual restrictions and procedures to include performance degradation with fuel, cargo limits, etc.

9.2.2.2. Minimum runway length for 50% flap flight idle touch-and-go landings is 5,000 feet. Minimum runway length for all other touch-and-go landings is 6,000 feet.

9.2.2.3. Minimum ceiling/visibility: 300 ft and RVR 40 (3/4 SM visibility) with an IP, 600 ft ceiling and 2 miles visibility for touch-and-go certified ACs.

9.2.2.4. Only authorized when crosswind component corrected for RCR is within the recommended zone for the landing crosswind chart.

9.2.2.5. Do not accomplish touch-and-go landings on slush covered runways.

9.2.2.6. Authorized when normal wake turbulence criterion is met.

9.2.2.7. Do not perform a no-flap ground-idle touch-and-go landing.

9.2.3. Include type of touch-and-go as part of the briefing, (i.e., ground-idle or flight idle).

9.3. Training on Operational Missions.

9.3.1. Crews may perform multiple approaches and touch-and-go landings on operational airlift (TWCF) and 618 TACC or theater C2 agency directed missions provided the following requirements are met:

9.3.1.1. Normal touch-and-go limitations apply and MEP are briefed of the activity.

9.3.1.2. All transition training will be accomplished during the first 12 hours of the FDP only.

9.3.1.3. Pre-mission coordination requirements. Activity shall be approved by TWCF/618 TACC or theater C2 agency tasking authority and unit training is charged to unit. As part of pre-mission planning, PICs will contact parent wing current operations and obtain training mission number(s) for use at each en route location(s) where training events are planned. In addition, PICs will coordinate with and receive approval from unit OG/CC and the airfield(s) where training is to be accomplished. They will then coordinate with the 618 TACC or theater C2 agency to ensure adequate ground time is available at planned training locations to allow for planned training events, clearing customs, required crew rest, etc. Once complete, wing current operations will coordinate with 618 TACC or theater C2 agency to re-cut the mission and add the training mission number(s) in World Wide Web, GDSS/C2IPS or GDSS2.

9.3.1.4. Upon initial arrival at the training location, close out the current line on the AFTO IMT 781 and log the training time on the next line using the appropriate training mission symbol and number.

9.4. Simulated Emergency Flight Procedures.

9.4.1. Simulated emergency flight procedures will be conducted IAW AFI 11-202V3 and this instruction.

9.4.1.1. In an actual emergency, terminate all training and flight maneuvers practice.

9.4.2. Practice emergencies, that require simulating an engine shutdown, placing switches in other than their normal position, or an abnormal configuration, only during training, evaluation, or currency flights when an instructor or flight examiner pilot is in one of the pilot seats. Preface all simulated emergencies with the word “simulated” and terminate simulated emergencies when an actual emergency arises. Do not conduct aircraft systems emergency procedures training during any tactical training (operating in low level environment or during tactical approaches). Copilots designated as AC candidates may perform any maneuver authorized for an AC (when in the left seat) under the direct supervision of an IP. Copilots having attained 500 PAA flying hours may conduct 3-engine approaches, missed approaches, and landings with squadron commander approval and when under the direct supervision of an IP. This restriction does not apply to MPD trained pilots. Unless otherwise specified in a MAJCOM supplement to AFI 11-202V2, place a letter of certification by the SQ/CC in the FEF and make an entry on the AF IMT 1381. IP candidates who occupy a pilot seat and are under the supervision of a flight examiner pilot not in a pilot seat may practice simulated emergency procedures during initial or requalification upgrade evaluations to instructor pilot. This applies to all maneuvers in **Table 9.1** unless otherwise specified in the restrictions.

9.4.2.1. Simulated Engine Failure. Direct IP supervision required except for IP candidates under the supervision of a flight examiner during initial or requalification upgrade evaluations to IP. One throttle may be retarded to FLIGHT IDLE at not less than VMCA (one engine inoperative, out of ground effect) and not less than 300 feet AGL.

9.4.2.2. Weather. Simulated engine failure is authorized in daylight IMC if the weather is at or above circling minimums and at night with weather at or above 1,000 foot ceiling and 2 SM visibility or circling minimums, whichever is higher. Crosswind component must be within the recommended zone of the landing crosswind chart.

9.4.2.3. Restrictions:

9.4.2.3.1. Simulated engine-out no-flap landings are restricted to AC upgrades and above.

9.4.2.3.2. Planned go-around from simulated engine-out no-flap approaches are not authorized.

9.4.2.3.3. Required go-around from simulated engine out no-flap approaches require setting the flaps to 50% and using all four engines.

9.4.2.3.4. Do not compound engine out circling approaches with any other simulated malfunctions.

9.5. Not Used.

9.6. Night Vision Goggle Training. Crews will accomplish aircrew training according to AFI 11-2C-130V1 and MAJCOM approved training guides before performing NVG operations.

9.6.1. Pilots who are both Touch-and-Go certified and NVG Airland Certified may perform NVG Touch-and-Go landings IAW **paragraph 9.2**. ***WARNING:*** Crews must be thoroughly familiar with the visual and/or aural cues required to identify the amount of runway remaining when performing Touch-and-Go operations.

9.7. Prohibited In-Flight Maneuvers. The following maneuvers will not be practiced or demonstrated in flight:

9.7.1. Full stalls.

9.7.2. Rudder force reversals.

9.7.3. Spins.

9.7.4. Simulated runaway trim malfunctions.

9.7.5. Simulated hydraulic system loss by turning engine driven hydraulic pumps off.

9.7.6. Simulated two-engine approaches or landings.

9.7.7. Simulated engine-out takeoffs.

9.8. Instructor Pilot Briefing. Before all training/evaluation missions, aircraft commanders or instructors/flight examiners should brief their crew on the following additional items:

9.8.1. Training/Evaluation requirements. Instructors/evaluators (for each crew position) will outline requirements and objectives for each student or examinee. Brief the training objectives IAW AMC C-130 Aircrew Training System syllabus.

9.8.2. Planned training area and seat changes.

9.9. Debriefing. Review and evaluate training performed by first collecting data and significant events that occurred, then reconstructing the mission and finally determining lessons learned. Each student or aircrew member should thoroughly understand lessons learned.

9.10. Simulated Instrument Flight. Artificial vision restricting devices are not authorized for any phase of flight. Simulated instrument flight may be flown and logged without the use of a vision-restricting device.

9.11. Flight Maneuvers. The maneuvers listed are authorized for qualification and continuation training (or formal upgrade training where indicated). Maneuvers restricted to FTUs will only be performed during formal training under direct IP supervision. They are applicable to all C-130 aircraft except when prohibited or restricted by the flight manual or other current directives. The pilot or IP will alert all crewmembers before accomplishing the following:

9.11.1. Approach to Stalls: Direct IP supervision required. Authorized during formal upgrade training in day VMC at a minimum of 10,000 ft above the ground or 5,000 feet above the cloud deck, whichever is higher.

9.11.2. Instrument Steep Turns: Authorized during daylight VMC with up to 60-degrees bank. Restricted to 5,000 feet above the ground or cloud deck for bank angles in excess of 45 degrees. Check stall speed prior to making instrument steep turns.

9.11.3. Slow Flight: Direct IP supervision required. Authorized at or above 5,000 feet AGL. Fly at approach, threshold, and 1.2 power off stall speed with gear down and flaps 0%, 50%, or 100%. Do not exceed 15-degrees of bank.

9.11.4. Maneuvers restricted to the formal training unit (FTU) can also be accomplished by units using the secondary method of formal training.

9.12. Operating Limitations.

9.12.1. Unless specifically authorized elsewhere, do not practice emergency procedures that degrade aircraft performance or flight control capabilities.

9.12.1.1. In an actual emergency, terminate all training and flight maneuvers practice.

9.12.2. Low/Missed Approaches. Initiate a planned missed approach no lower than:

9.12.2.1. Precision approach – Decision Height.

9.12.2.2. Non-precision approach – MDA.

9.12.2.3. Visual Approach – 200 feet AGL for simulated emergencies (no minimum for non-emergency).

9.12.2.4. Restricted Low Approach (aircraft, equipment, or personnel are on the runway) – 500 feet AGL.

9.13. Landing Limitations.

9.13.1. No-Flap Landing Limitations:

9.13.1.1. Direct IP supervision required.

9.13.1.2. Not authorized for copilots with less than 500 PAA hours.

9.13.1.3. No-flap circling approaches are not authorized for copilots.

9.13.1.4. Engine out no-flap approaches are not authorized for copilots.

9.13.1.5. Do not combine no-flap circling approaches with any other simulated emergencies.

9.13.1.6. Maximum gross weight is 120,000 lbs.

9.13.1.7. Crosswind component must be within the recommended zone on the crosswind chart.

9.13.1.8. Authorized in daylight IMC if the weather is at or above circling minimums and at night with weather at or above 1000 foot ceiling and 2 SM visibility or circling minimums whichever is higher.

9.13.1.9. Use 50% flaps for a go-around. ***NOTE:*** Check no-flap landing distance with runway available.

9.13.2. Stop-and-Go Landing Criteria:

9.13.2.1. Authorized only on designated training, evaluation, or currency missions.

9.13.2.2. Authorized to be performed by any C-130 qualified pilot.

9.13.2.3. Runway remaining for takeoff must be greater than or equal to CFL.

9.13.2.4. Crosswind component corrected for RCR must be in the recommended zone of the landing crosswind chart.

9.13.2.5. Ceiling and visibility must be at least 300 feet and ¾ mile (RVR 40).

9.13.3. Do not perform stop-and-go landings:

9.13.3.1. In conjunction with no-flap landings.

9.13.3.2. When normal wake turbulence criterion is not met.

9.13.3.3. When intercepting or crossing the flight path of a wide-bodied aircraft while performing an approach or landing.

9.13.4. Max-effort landing limitations & brake cooling procedures. A lack of consideration for the heat generated in the wheel brakes can result in fused or hot brakes leading to a possible tire explosion or fire. Crews are reminded to review the Dash -1 regarding use of wheel brakes and hot weather procedures. During training, the following procedures will be followed while conducting multiple max-effort landings using partial brake landing criteria:

9.13.4.1. Crews will not perform more than three consecutive heavy weight max-effort landings (115,000 – 130,000 pounds) without an approx 15 minute airborne gear-down brake cooling period (i.e. rectangular pattern to either a touch-and-go or a low approach to the main runway).

9.13.4.2. Outside ambient air temperatures of > 35 degrees Celsius:

9.13.4.2.1. Crews will not perform more than two consecutive heavy weight max-effort landings (115,000 – 130,000 pounds) without an approx 15 minute airborne gear-down brake cooling period (i.e. rectangular pattern to either a touch-and-go or a low approach to the main runway).

9.13.4.2.2. Crews will not perform more than three consecutive max-effort landings (<115,000 pounds) without an approx 15 minute airborne gear-down brake cooling period (i.e. rectangular pattern to either a touch-and-go or low approach to the main runway).

9.13.4.2.3. Crews should not terminate or conduct operations requiring extended brake application (i.e. ERO, seat swap, etc.) following a max-effort or no flap landing. On normal landings, crews should consider extending rollout to minimize the use of the brakes.

9.13.4.3. If the crew observes the initial signs of possible brake overheating, consider taking off and leaving the gear down for at least a 15-minute gear cooling period (i.e. to a low approach or touch and go). However, if you suspect or have hot brakes follow the Dash-1 procedures and do not set the parking brake, but chock the nose wheel prior to ground evacuation/engine shutdown.

9.14. Actual Engine Shutdown and Airstart. Direct IP supervision required. One engine may by shutdown at no lower than 2,500 feet AGL in daylight VMC.

9.15. Windmill Taxi Start. Direct IP supervision required. Authorized during daylight. Crosswind component must be within the recommended zone of the flight manual takeoff crosswind chart. Runway must be dry, hard-surfaced, and at least 147 feet wide. Dash one recommendations are mandatory. Requires OG/CC approval when performed at units other than the Formal Training Unit (FTU).

9.16. Aborted Normal Takeoff. Direct IP supervision required. Authorized during formal upgrade training in daylight. Crosswind component must be within the recommended zone of the takeoff crosswind chart. Runway must be dry, hard-surfaced, and long enough to allow refusal and takeoff speeds to be equal. Initiate the abort by stating “REJECT” before refusal speed. Do not practice aborts from touch-and-go landings. Prebrief all actual engine shutdowns due to a simulated malfunction. Do not shut down an engine due to simulated malfunctions. Requires OG/CC approval.

9.17. Aborted Maximum Effort Takeoff. Direct IP supervision required. Authorized for AC upgrades and above during formal upgrade training. Restricted to the main runway during daylight. Crosswind component must be within the recommend zone of the takeoff crosswind chart. Runway must be dry, hard surfaced, 147 feet wide and long enough to allow refusal and takeoff speeds to be equal. Simulate a runway length less than CFL. Initiate the abort by stating “REJECT” at or below a refusal speed based on simulated runway length. Compare the distance traveled to runway length and point out the ramifications of operating with less than critical field length. Cool brakes between aborted takeoffs. Do not shut down an engine due to simulated malfunctions. Do not practice aborted max effort takeoffs from stop-and-go landings. Requires OG/CC approval.

9.18. Maximum Effort Takeoff. ACs may accomplish maximum effort takeoffs. Maximum effort takeoffs should be performed from the main runway when it is available (i.e., safe and

practical to taxi from an assault landing zone). Takeoffs from the assault zone are authorized during formal mission qualification training or when approved by the OG/CC for currency or proficiency.

9.19. Training Aircraft Not Capable of Flight (Not applicable to AFRC and ANG). If an aircraft is not capable of departure within four hours after scheduled departure time, cancel the training mission. The unit CC/DO may grant exceptions. Provide a planned minimum of 1 ½-hours for aircraft preflight duties before the end of the 4-hours.

Table 9.1. Training Flight Restrictions.

Maneuver	Altitude	Remarks
Instrument Missed/low approaches	MDA/DH	Initiate practice instrument missed approaches no lower than the minimum altitude for the type of approach executed.
Visual Low Approach/Planned Go Around	200 Feet for simulated emergencies No minimum for non-emergency	
Men and equipment on runway	Initiate above 500 ft AGL	
Simulated Engine Failure		Certified 500 PAA hour copilot or above with direct IP Supervision. Does not apply to MPD trained pilots. Prohibited during tactical operations. Retard one throttle to flight idle at not less than VMCA (one engine inoperative, out of ground effect) or less than 300 feet AGL. Authorized day IMC if WX at or above circling minimums or night if weather is at or above 1,000 foot ceiling and 2 SM visibility. Crosswind component must be in the recommended zone. Engine out no flap landings are restricted to ACs and above, and planned go-around are not authorized. Engine out circling approaches will not be compounded with any other simulated malfunctions.

Maneuver	Altitude	Remarks
No-Flap Landing		Not authorized for copilots with less than 500 PAA hours. Simulated engine-out-no-flap approaches not authorized for CPs. No-flap circling approaches will not be combined with any other simulated emergencies. Max gross weight is 120,000 lbs. and crosswind component must be within the recommended range. Authorized in day IMC if WX is at or above circling minimums, and at night with WX or 1,000 foot ceilings and 2 SM visibility or circling minimum, whichever is higher.
Touch-and-Go Landings		Requires flight evaluation, certification and minimum 100 hours as pilot-in-command. ACs restricted to flight idle touch and go landings. Ground idle performed by any pilot from any seat when a flight evaluator, IP or IP candidate during upgrade/evaluation occupies a pilot's seat. No-flap ground idle touch and go landings not authorized. Minimum runway length: flaps 50 percent, 5,000 feet – for all other, 6,000 feet. Crosswind component corrected for RCR is within recommended zone. Minimum ceiling of 600 ft and minimum visibility of 2 SM (300-ft and RVR 40 (3/4 SM visibility) if an IP is in either seat.)

Maneuver	Altitude	Remarks
Stop-and-Go Landings		Authorized only on designated training, evaluation or currency missions. Authorized to be performed by any C-130 qualified pilot. Runway remaining for takeoff must be equal to or greater than CFL. Crosswind component corrected for RCR must be in recommended zone of the landing crosswind chart. Ceiling and visibility must be at least 300-feet and ¾ mile (RVR 40)
Slow Flight Demonstration	At or above 5,000 feet AGL.	Fly at approach, threshold, and 1.2 times stall speed with gear down, 0, 50, 100 percent. Do not exceed 15-degrees of bank.
Approach to Stalls	At or above 10,000 feet above the ground or 5,000 feet above the cloud deck	Day VMC
Steep Turns	5,000 feet for bank angles in excess of 45 degrees	Not applicable during tactical maneuvers. Authorized during day VMC with up to 60-degrees of bank. Review stall speeds before performing turns.

NOTE: These restrictions do not apply to operational missions.

Chapter 10

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

10.1. Overview. The proliferation of Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) weapons and the means to deliver them present serious security threats to the global operations of air mobility forces. This chapter describes the CBRNE threat, passive defense measures to mitigate that threat, and guidance for ground and flight operations in a contaminated environment.

10.2. Understanding the CBRNE Threat.

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

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

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

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

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

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

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

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

10.3.1.2. Survival Launch. If caught on the ground during attack warning, every reasonable effort will be made to launch to avoid the attack. Upon proper clearances, aircrew may launch to survive if they have sufficient fuel and unrestricted, safe access to the runway. In practice, this option may only be practical for aircraft that have just landed or aircraft at or near the end of the runway. If launch is not possible, shut down engines and avoid running environmental control systems. Close aircraft doors/hatches/ramps, don Individual Protective Equipment (IPE), and seek personal protective cover on the base. If time does not permit using base facilities, and teh attack is a missile attack, remain in the sealed aircraft for a minimum of one-hour after the attack and/or follow host-base guidance.

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

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

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

10.3.2.1.1. ACDE/GCE Issue. Aircrews will be issued sized ACDE and GCE at home station. Aircrews will ensure their ACDE and GCE are available at all times while in a CBRNE threat area. Aircrew members will confirm the mobility bag contents and correct sizes.

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

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

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

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

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

10.3.3.2. Decontamination.

10.3.3.2.1. In-flight Decontamination. Air washing is a useful in-flight decontamination technique for removing most of the liquid agent from aircraft metal surfaces. However, vapor hazards may remain in areas where the airflow characteristics prevent complete off-gassing (i.e., wheel wells, flap wells, rivet and screw heads, joints, etc.). Flights of at least 2 to 4 hours are recommended, and lower altitudes are more effective than higher altitudes. Fly with the aircraft configured (gear, flaps, and slats extended) as long as possible to maximize the airflow in and around as many places as possible. Be advised that exterior contamination may seep into the aircraft interior creating a vapor hazard for aircrews. Use of ACDE is recommended. Follow smoke and fume elimination procedures to help purge interior contamination.

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

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

10.4. Flight Operations.

10.4.1. Mission Planning. Aircrews must be mentally prepared to face the dangers of CBRNE weapons. Flight/mission planning must be thorough. Aircraft commanders should emphasize ACDE wear, crew coordination, CBRNE hazards and countermeasures, in-flight diversion, plans for on-load/offload in the event of a ground attack, and plans for the return leg in the event of aircraft contamination. Alternative scenario plans should also be considered in the event mission-oriented protective posture (MOPP) conditions change.

10.4.2. Establishing the Threat Level. Aircrews should monitor command and control channels to ensure they receive the latest information concerning the destination's alert condition. Diversion of aircraft to alternate "clean" locations may be required, unless operational necessity otherwise dictates. The 618 TACC or theater C2 agency (normally through the controlling OPORD) will direct aircrew pre-exposure activities such as medical pre-treatment for chemical/biological exposure or issue dosimetry for potential radiological hazards.

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

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

10.4.5. Donning Equipment. Aircrew will don ACDE based on the alarm condition (See Airman's Manual (AFMAN 10-100). Use the "buddy dressing" procedures, and refer to AMCVA 11-303, AMCVA 11-304, and the C-130 T.O., to ensure proper wear. When wearing the ACDE, Atropine and 2 PAM Chloride auto injectors will be kept in the upper left ACDE pocket. If the integrated survival vest/body armor is worn, the Atropine and 2 PAM Chloride auto injectors may be kept in the lower right flight suit pocket. This standardized location will enable personnel to locate the medication should an individual be overcome by CWA poisoning. M-9 paper on the flight suit will facilitate detection of liquid chemical agents and ACCA processing. M-9 paper should be placed on the flight suit prior to entering the CBRNE threat area or when an alarm "yellow" or higher has been declared.

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

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

10.5. Ground Operations.

10.5.1. Crew Rest Procedures. Operational necessity may require the aircrew to rest/fly in a contaminated environment. If the mission is not being staged by another aircrew or pre-flight crews are not available, the aircrew may pre-flight, load, and secure the aircraft prior to entering crew rest. The departing aircrew will perform necessary crew preparations and pre-flight briefings. Then, they will report to the ACCA for processing and ACDE donning with assistance from ALS personnel. If possible, aircrew transport should be provided in a covered vehicle. Aircrews should avoid pre-flighting the aircraft prior to departure to prevent contamination spread to them and/or the aircraft. As aircrews proceed to fly, they will require assistance from ground support personnel in removing their aircrew protective overcape and overboots prior to entering the aircraft.

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

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

10.5.4. Airlift of Retrograde Cargo. Only CRITICAL retrograde cargo will be moved from a contaminated to an uncontaminated airbase. Critical requirements are pre-designated in theater war plans. On-load cargo will be protected prior to and while being transported to the aircraft. If contaminated, protective cover(s) will be removed/replaced just prior to placing the cargo on the aircraft. It is the user's responsibility to decontaminate cargo for air

shipment. The airlift of contaminated or formerly contaminated cargo requires the approval of the senior transportation commander.

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

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

10.5.7. Work Degradation Factors. Work timetables need to be adjusted to minimize thermal stress caused by wearing the ACDE. Aircrews must weigh all factors when performing in-flight and ground duties. Table 10.1. has degradation factors for wearing full GCE, and may be used to represent the Task Time Multipliers for the ACDE. A more extensive discussion of this subject is found in AFMAN 10-2602.

10.5.8. Outbound with Actual/Suspected Chemical Contamination. Once airborne with actual/suspected vapor contamination, the aircraft must be purged for 2 hours using Smoke and Fume Elimination procedures. To ensure no liquid contamination exists, a close inspection of aircrew, passenger ensembles, and cargo will be conducted using M-8 and M-9 detection paper. Detection paper only detects certain liquid agents and will not detect vapor hazards. Above the shoulder ACDE should only be removed if there is absolutely no vapor hazard. Be advised that residual contamination (below the detectable levels of currently fielded detection equipment) may be harmful in an enclosed space. The aircrew must take every precaution to prevent spreading of liquid contaminants, especially on the flight deck area. The best course is to identify actual/suspected contamination, avoid those areas for the remainder of the flight, and keep the cargo compartments cool. If an aircrew member or passenger has been in contact with liquid contaminants, all personnel aboard the aircraft will stay in full ACDE/GCE until processed through their respective contamination control area (CCA). Upon arrival, the contaminated aircraft will be parked in an isolated area and cordoned to protect unsuspecting ground personnel.

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

10.5.10. 10-Foot Rule. The 10-foot rule was developed in order to provide guidance for protecting personnel using or handling contaminated resources (such as pallets) or working in locations with materials that might retain a residual chemical. The 10-foot rule embodies a safety factor that goes beyond current OSD guidance (which allows removal of IPE whenever detectors no longer detect a chemical agent vapor hazard). There are two phases associated with the 10-foot rule.

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

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

10.5.10.3. **Table 10.2** shows "estimated" times associated with initial and follow-on phases of the 10-foot rule. To simplify response processes, commanders may choose to use the worst-case scenario as the foundation for all 10-foot rule actions, i.e., 24 hours for the initial phase and all periods of time greater than 24 hours for the follow-on phase.

Table 10.1. Work Degradation Factors.

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

Table 10.2. Ten-Foot Rule Time Standards (Source:

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

Chapter 11

NAVIGATION PROCEDURES AND FORMS

11.1. General.

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

11.1.2. General instructions for completion of AF IMT 4116, **C-130 Flight Plan and Record,** are provided in this chapter. MAJCOM-approved computer flight plans may be used as a substitute for AF IMT 4116.

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

11.2. Mission Planning Procedures.

11.2.1. The PIC and navigator will jointly verify routing, altitude, and fuel load prior to departure. On flight managed sorties, the PIC and the navigator will review the flight plan provided by the FM. Any disagreements/discrepancies/requests for change will be coordinated with and through the FM. Use the chart updating manual or host nation chart updating product to update charts within 10-NM of the approach, departure, emergency and divert bases for airfields without a DOD or Jeppesen approved approach plate. FalconView generated charts with updated ECHUM overlays fulfill this requirement. A copy of the navigator's flight plan will be provided to the copilot to verify routing and aid in position reporting. Navigator crew changes (engine running offload or augmented crews) will include, as a minimum, a briefing on equipment status.

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

11.2.3. A MAJCOM-approved CFP, AF IMT 70, or AF IMT 4116 is required for all flights except local area training flights with an established standard procedure.

11.2.4. A fuel plan is required for all flights except routine local area training flights where the fuel requirement has been verified.

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

11.3. Flight Planning.

11.3.1. Most entries on the AF IMT 4116 are self-explanatory or explained below.

11.3.1.1. HIGHEST ACC FL - Highest Acceptable Flight Level. This altitude is obtained from the appropriate aircraft performance manual.

11.3.1.2. WPT - Waypoint. Use this column to indicate the number of each waypoint as entered in the aircraft computer.

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

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

11.3.3. Aircrews may use ACFP, PFPS or any other MAJCOM approved flight planning program. On a flight managed sortie, the FM uses AMC certified ACFP to create the CFP.

11.4. Equal Time Point Computations.

11.4.1. Use the worksheet on the AF IMT 4116, page 2, to calculate the time to ETP.

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

11.4.3. ETP Computations (see **Figure 11.1**). Computations are required on Category I routes or Category I portions of routes when the total time between the last suitable airfield (LSAF) and the first suitable airfield (FSAF) is 5-hours or more.

11.4.4. Additional guidance on calculating an ETP can be found on the AMC/A3V web page in the Pubs section: **https://private.amc.af.mil/a3/a3v/publications.aspx**; under Miscellaneous Documents.

11.5. Flight Charts.

11.5.1. Show the following items on the chart:

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

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

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

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

11.5.1.5. Annotate the approximate location of the ETP.

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

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

11.5.4. FalconView produced Lambet-Conformal charts may be used.

11.6. In-flight Procedures.

11.6.1. The navigator will monitor the primary command radio unless directed to do otherwise. The navigator will record ATC clearances and monitor the read back. This will

normally include all ATC instructions involving departure, en-route, and approach procedures. This procedure is not applicable when ATC instructions require immediate execution by the pilot, or when such action interferes with the timely performance of other time-sensitive navigator duties.

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

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

11.6.4. Compute a TAS check on all Category I routes of 3 hours or longer. Use the procedures in **paragraph 11.11**.

11.6.5. Maintain a flight log on Category I routes or route segments of 3 hours or longer. Time between fix/MPP plots will not exceed 1 hour. ***NOTE:*** Malfunctions or loss of navigational capability, which degrade course centerline accuracy, will be reported immediately to ATC.

11.6.6. On Category I routes, when the time between the LSAF and FSAF is 5-hours or more, the following procedures are required: wind factors, equal time point (ETP) calculations, and in-flight fuel management.

11.6.7. Heading deviation checks are not required on Category II routes, tactical routes, or on aircraft without compasses. On Category I routes or route segments of 3-hours or longer, compute heading deviation for each compass system as soon as practical after initial level-off or coast out. Record deviation for all compass systems (see **paragraph 11.10**).

11.7. Laptop Computers. Laptop computers running Falcon View moving map software and connected to a handheld GPS provide invaluable situational awareness. Laptop computers and handheld GPS must be approved for unrestricted use in flight IAW AFI 11-202 V3.

11.7.1. Navigators should carry a USAF approved laptop on all missions.

11.7.1.1. Handheld GPS units should be connected and the Falcon View Moving Map Display should be operating.

11.7.2. Laptop computers with handheld GPS Falcon View moving map displays will not be used as the primary source of navigation.

11.8. Flight Records. Flight progress will be recorded for Category I routes of 3-hours or longer. Record enough detail to reconstruct the mission. Units may publish local standards for log procedures in the unit supplement. See **Figure 11.2** for an example of a completed AF IMT 4116.

11.8.1. This form will consist of planning and in-flight progress data. It will be completed in sufficient detail to fully evaluate or reconstruct the flight. Page 1 of the form will be completed when a CFP is not available on Category I routes. Section IX, In-Flight Data, will be used to record present positions and spot readings. The procedures below are general in nature and designed to accommodate a wide range of C-130 navigation equipment configurations.

11.8.1.1. As soon as practical after level-off or coast-out, whichever occurs latest, navigators will verify aircraft position by either navigation aid fix or radar fix.

11.8.1.1.1. Record the fix in AF IMT 4116 Section VIII, Radar/NAVAID Data.

11.8.1.1.2. At the time of the fix record the primary navigation solution and corresponding deltas (or Lat/Long) for all other navigation solutions in AF IMT 4116 Section VI, Fix/Computer Position.

11.8.1.1.3. At the time of the fix record, as a minimum, GMT, present position, true heading, spot w/v, TAS, altitude and ETA to the next waypoint in AF IMT 4116 Section IX, In-Flight Data.

11.8.1.2. After coast out, record current position every 30 minutes on AF IMT 4116 Section VI, Fix/Computer Position.

11.8.1.2.1. Record the present position for the primary navigation solution.

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

11.8.1.3.1. Record the GMT, current position of the primary navigation system, true heading, spot w/v, TAS, altitude, ETA to the next waypoint, and corresponding deltas (or Lat/Long) for all other navigation solutions.

11.8.1.4. Between recorded positions, record spot readings at regular intervals to allow for calculating a DR in the event of a navigation system failure.

11.8.1.4.1. Spot readings will include, as a minimum, time, heading, drift angle, ground speed, spot w/v, and TAS.

11.8.1.5. As soon as practical prior to coast-in, navigators will verify aircraft position by either navigation aid fix or radar fix.

11.8.1.5.1. Record the fix in AF IMT 4116 Section VIII, Radar/NAVAID Data.

11.8.1.5.2. At the time of the fix record the primary navigation solution and corresponding deltas (or Lat/Long) for all other navigation solutions in AF IMT 4116 Section VI, Fix/Computer Position.

11.8.1.5.3. At the time of the fix record, as a minimum, GMT, present position, true heading, spot w/v, TAS, altitude and ETA to the next waypoint in AF IMT 4116 Section IX, In-Flight Data.

11.8.2. In the event of a navigation system failure (INU or GPS) full log procedures will be implemented. Beginning at the last plotted position, compute a DR up to the present position. Plot a fix/MPP at a minimum of once per hour. A DR associated with the fix/MPP will be plotted on the chart prior to plotting the position. If the navigation system failure is resolved, the navigator may resume log procedures as outlined in **paragraph 11.8.1**.

11.8.2.1. At the time of the fix/MPP record the GMT, current position, true heading, spot w/v, true air speed, altitude and ETA to the next point.

11.8.2.2. As soon as practical prior to coast-in, navigators will verify aircraft position by either navigation aid fix or radar fix.

11.9. Celestial Procedures.

11.9.1. See AFPAM 11-216 for a comprehensive discussion of celestial concepts.

11.10. Deviation Check Procedures.

11.10.1. Heading checks should be computed in Section V of AF IMT 4116. Mid-time celestial heading checks may be recorded in the Section IX. When a heading check is performed based on INS/SCNS, note that in the pre-comp area of the deviation checks section. The AF IMT 4116 deviation checks format solves for "deviation" (DEV) for all heading reference systems. Some navigation computers such as the SCNS allow the navigator to input compass "deviation." In this case reverse the sign of the "deviation" to arrive at "deviation correction."

11.10.2. Dual INS Heading Checks. Deviation check not required.

11.10.3. Single INS/SCNS Heading Checks. Record and compare the INS/SCNS true heading with all compass systems.

11.10.4. In order to obtain an accurate celestial heading check, the exact ZN must be derived. Exact ZN is obtained by interpolating using exact longitude, latitude, declination, and LHA. ZN may also be derived from SCNS immediate page and the subpoint of the celestial body used for the heading check.

11.11. True Airspeed (TAS) Check Procedures.

11.11.1. Accomplish within one hour of initial cruise altitude. Record time of the check and altitude on the pressure altimeter. If using free air temperature gauge, record indicated outside air temperature (IOAT). Use the heat of compression table on AF IMT 4116 to convert IOAT to true outside air temperature (TOAT). If using SCNS temperature, record TOAT.

11.11.1.1. TAS check not required for C-130H3 aircraft.

11.11.2. Normally, navigators on all C-130 models can use 0 knots for indicated airspeed (IAS) to calibrated airspeed (CAS) correction and minus 3 knots for CAS to equivalent airspeed (EAS) correction for TAS above 270 (or minus 2 knots if less than or equal to 270).

11.11.3. ITAS - Indicated TAS. Record the TAS reading from the TAS meter and the SCNS/INS or other computer (if the aircraft is so equipped). Record the difference between computed TAS and this reading in the CORR block.

11.12. In-flight Fuel Management Procedures.

11.12.1. Record the fuel readings listed below at level off time and regular time intervals (coinciding with entries on aircraft performance record), not to exceed 1 hour and 30 minutes. Use section VII, In-flight Fuel Management of the AF IMT 4116 to complete in-flight fuel management computations.

11.12.1.1. ETA DEST. Best known arrival time at destination.

11.12.1.2. TIME. Time of the fuel reading.

11.12.1.3. TERMINAL FUEL FLOW.

11.12.1.4. CURRENT FUEL FLOW.

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

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

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

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

11.12.1.9. FUEL ETE. Calculate using formula in **11.12.2.3**.

11.12.1.10. ETE DEST. Subtract TIME from ETA DEST.

11.12.1.11. EXT TIME. Subtract ETE DEST from FUEL ETE. Report this value to the pilot. If this is a negative value, check the computation and values for errors. If they are correct, evaluate your destination options.

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

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

11.12.2.2. Present fuel - Overhead fuel = Usable Fuel

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

11.12.2.4. Fuel ETE - ETE to destination = Extra Time

11.12.3. AF IMT 4125, **Range Control Chart** may also be used for in-flight fuel management.

11.12.3.1. Manual Construction. (**Figure 11.4**)

11.12.3.1.1. "POINT NUMBER" represents the approximate level-off point (initial cruise altitude), 25, 50, 75, and 100 percent of the flight plan distance as indicated on AF IMT 4116 or CFP.

11.12.3.1.2. Column A, "EN ROUTE AND DESTINATION FUEL": AF IMT 4116 takeoff fuel minus en route reserve fuel.

11.12.3.1.3. Column B, "EN ROUTE FUEL": The fuel (en route + identified extra fuel) planned to be burned off by the time each of the given points defined in **paragraph 11.12.3.1.1** are reached.

11.12.3.1.4. Column C, "MINIMUM FUEL": Subtract Column B (EN ROUTE FUEL) from column A (EN ROUTE AND DESTINATION FUEL). This fuel is the minimum, at each given point, to fly from that point to destination with sufficient fuel to make a missed approach (if required), continue to the destination alternate, hold, make the planned approach, and land with 4,000 pounds of fuel. Minimum fuel will also include any identified extra fuel needed overhead the alternate (e.g., excess holding, for succeeding legs, etc.). The minimum fuel at the 100 percent point should be the same as required overhead fuel.

11.12.3.1.5. Column D, "DISTANCE": The flight plan distance for the given points listed in **paragraph 11.12.3.1.1**, obtained from AF IMT 4116. This can be graphically depicted as either distance flown or distance remaining.

11.12.3.1.6. "DISTANCE FLOWN/REMAINING": Label the nautical miles to the destination along the horizontal scale. For distance flown start with 0 at the left and allow the major blocks to represent convenient increments of mileage. ***NOTE:*** The distance scale should be expanded to the maximum to give as large a presentation as possible.

11.12.3.1.7. Draw a vertical line on the graph representing total distance to destination and label this line with the destination name.

11.12.3.1.8. Estimated Performance/Minimum Arrival Fuel Lines. Estimated Performance is based on planned fuel at T/O, level off, and arrival plotted parallel to the minimum fuel line.

11.12.3.1.9. A "minimum arrival" line will be constructed by plotting fuel in column C versus distance in column D.

11.12.3.1.10. An "estimated performance" line will be constructed by plotting a line parallel to the minimum arrival line based on planned take-off, level off and arrival fuel.

NOTE: The difference between the estimated performance line and the minimum arrival line is reserve and unidentified extra fuel.

NOTE: Plot vertical lines representing ETPs if required at the appropriate distance flown/remaining.

11.12.4. The navigator may terminate these procedures one hour from destination, when the Category I route segment is completed, or at the discretion of the PIC.

11.13. Airborne Radar Approach Procedures.

11.13.1. VFR Operations. Units will construct VFR ARA approaches IAW AFI 11-230, *Instrument Procedures*, and submit VFR ARA approach plates for approval to OG/OGV. During VFR, the minimum ceiling and visibility will be 1,500 feet and 3 miles. VFR cloud clearances will be maintained at all times while performing VFR ARAs. Publish approved VFR ARA approaches in local supplements. The local supplement should include SCNS ARA input data. If available, pilots will back up the navigator using a published instrument approach.

11.13.1. **(934AW)** 934 AW VFR ARA Approaches and SCNS data are published in the 934 AW In-flight Guide.

11.13.1.1. Navigators will load ARA information into the SCNS for all NVG airland operations. Navigators may modify existing approaches to meet this requirement. Units should publish local procedures in the unit supplement to this AFI.

11.13.2. IFR Operations. Crews are only authorized to perform ARAs in IMC with a valid TERPSed approach. Weather minimums will be established by the approach, but will be no lower than 500-feet and 1 mile (300-feet and 1 mile for AWADS certified crews).

11.13.3. Planning and Coordination. Prior to entering the terminal area, the navigator will coordinate the following items with the PF:

11.13.3.1. Desired pattern altitudes and headings.

11.13.3.2. Distance on final where descent will commence.

11.13.3.3. Glide slope angle and initial rate of descent (normally not greater than 400-feet per NM). Refer to **Figure 11.3** for descent rate examples.

11.13.3.4. Minimum descent altitude and missed approach point/procedures. Missed approach will conform to published procedures for a useable approach, if able.

11.13.4. Terminology and Procedures.

11.13.4.1. Pattern Control. The navigator will advise the PF when positive radar identification of the airfield complex is made.

11.13.4.2. The navigator will direct the aircraft by headings to the final approach course. For AWADS equipped units, navigators may advise the PF to intercept the bank steering bar (as required), when flying computer ARAs.

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

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

11.13.4.5. 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."

11.13.4.6. The navigator will give heading information at least every nautical mile during the final approach. AWADS-equipped units are authorized to perform computer ARAs using AWADS equipment in VMC or IMC according to **paragraph 11.13.1** and **paragraph 11.13.2**.

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

11.14. Grid Procedures.

11.14.1. Definitions and formulae. See AFPAM 11-216.

11.14.2. Grid Log. The navigator will use page 6 of the AF IMT 4116 when grid navigation procedures are required. Block entries are as follows:

11.14.2.1. Time. Time of celestial heading/system heading observation.

11.14.2.2. TH. Observed/computed true heading.

11.14.2.3. CA/LONG. Enter +W -E longitude (polar chart) or convergence angle.

11.14.2.4. GH. Observed/computed grid heading.

11.14.2.5. GYRO #1, GYRO #2. On aircraft equipped with two independent gyro stabilized systems with numbers corresponding to aircraft systems (e.g. C-12 No. 1, N-1

No 2), circled number denotes the primary steering gyro. On aircraft whose systems are not numbered or do not correspond to the aircraft system, identify the primary steering gyro in "REMARKS".

11.14.2.6. GR. Gyro reading. Record the reading from the primary compass.

11.14.2.7. PREC. The amount of precession since the last heading shot (period precession): GH - GR = PREC.

11.14.2.8. RATE/CUM. The hourly precession rate based upon the precession indicated at the time of observation. Precession rate is derived from the period precession and the applicable elapsed time period (since the last compass reset). ***Example:*** 2 degrees precession in 40 minutes equals a 3 degrees/hour precession rate. This entry is required only when period precession is greater than one degree. The cumulative portion of the block is used for tracking the cumulative precession rate once a false latitude has been set.

11.14.2.9. LAT. The mid-latitude between the current observation and the next proposed observation.

11.14.2.10. FALSE LAT. The false latitude setting being used to eliminate precession. This entry is required only when a false latitude setting is used.

11.14.2.11. RESET. Whenever a gyro is reset, place a check mark in this block.

11.14.2.12. GC. Measured grid course to the next checkpoint.

11.14.2.13. DRIFT. The number of degrees (+ or -) of drift.

11.14.2.14. DGH. Desired grid heading. Apply anticipated DRIFT to GC.

11.14.2.15. RT/2 CORR. See formula on the bottom of the AF IMT 4116.

11.14.2.16. IGH. Initial grid heading. Used for alter heading.

11.14.2.17. GRID ENTRY. Apply grivation (GRIV) to Magnetic Heading (MH) to obtain desired grid heading (DGH); or apply (LONG) or convergence angle (CA) to True Heading (TH) to obtain DGH. See formulas on the AF IMT 4116.

11.14.2.18. GRID EXIT. Apply GRIV to DGH to obtain MH; or apply LONG or CA to DGH to obtain TH. See formulas on the AF IMT 4116.

11.14.3. Grid Celestial Computations:

11.14.3.1. When plotting celestial lines of position (LOPs) in grid reference, apply longitude (polar chart) or convergence angle to the true azimuth and plot the grid azimuth.

11.14.3.2. When taking heading checks at high latitudes, it is advisable to place data into the periscopic sextant to give the true heading and convert this heading to grid by applying the assumed LONG/CA.

11.14.4. Construction and use of the ZN graph is optional. The ZN graph is based upon the route of flight and dead reckoning. See AFPAM 11-216 for construction procedures.

11.14.5. Departure Requirements:

11.14.5.1. Polar true/grid courses as reflected in FLIP terminal charts will be used for departures in polar areas. Before takeoff, visually align the aircraft with the runway heading and set the polar true/grid course of the runway in the aircraft's directional gyros. The navigator will set applicable systems in gyro mode with the correct latitude set.

11.14.5.2. After reaching flight altitude, determine the polar true grid heading and reset the primary and secondary gyros. The type of chart being used will determine whether the heading will be polar grid heading or convergence grid heading.

11.14.6. En Route Requirements:

11.14.6.1. The Grid Entry/Exit section of the AF IMT 4116 will be completed prior to heading reference changes. When entering grid operation, spot grivation should be applied to the computed magnetic heading to obtain DGH. The aircraft will be established on the computed magnetic heading prior to resetting the heading references. When exiting grid, the computed magnetic headings will be the target heading when the compass systems are reset. In both cases, the computed magnetic headings will be compared to the flight plan to verify the accuracy of the courses measured and conversion data used. This will ensure the validity of initial entry headings and provide precise target headings for exit.

11.14.6.2. Normally, the grid heading will be checked each 30-minutes after grid entry. If the compasses are precessing 3 degrees per hour or less, hourly checks may be obtained after the first hour. ***NOTE:*** On aircraft with reliable SCNS/INS, if the SCNS/INS heading is within 2 degrees of the initial celestial-derived grid heading, the SCNS/INS may be used to determine gyro precession.

11.14.6.3. Determine the precession information for each gyro after each heading check. When a gyro's precession is greater than 1 degree, reset the gyro to correct grid heading. When the period precession is 1 degree or less, the navigator may either reset the gyro or treat the precession as zero.

11.14.6.4. Whenever the period precession is greater that 1 degree (optional for 1 degree or less), the hourly precession rate may be removed by use of a false latitude setting. When the combined earth rate and gyro precession are less than +15 degrees/hour, the false latitude setting will totally compensate for precession. Two considerations are necessary:

11.14.6.4.1. Predicted precession becomes zero.

11.14.6.4.2. It may be necessary to adjust previous DR and air plot positions if the precession rate changes at subsequent heading checks. If this occurs, adjustments normally will be small and have negligible effect on DR and air plot accuracy; however, the effect should be considered.

11.14.6.5. To determine false latitude correction, enter the earth rate table with the desired latitude and extract the tabulated earth rate value. Algebraically combine the earth rate value and the observed hourly precession rate (use cumulative precession rate once a false latitude has been set). Re-enter the earth rate table with the combined value and extract the corresponding false latitude.

11.14.6.6. Only 15 degrees/hour can be removed by a false latitude setting. When the sum of earth and primary gyro precession rates exceeds +15 degrees, the navigator must artificially steer the aircraft (in effect, the aircraft will fly a gentle arc) to compensate for the amount of precession in excess of +15 degrees/hour. The formula used to correct the DGH to an initial grid heading (IGH) to fly appears on the AF IMT 4116 as "RT/2 CORR" (note that the formula produces a correction, so the precession rate must be given its opposite sign). The precession rate used in the formula must be adjusted to reflect the time period in the DR ahead. When "carrying" precession as suggested above, the navigator should consider several aspects of the navigational problem: ***NOTE:*** When precession exceeds 15 degrees per hour, consider the compasses unusable.

11.14.6.6.1. If alter headings are not made at heading check times, precession will have accumulated by alter heading times and a correction (opposite sign of precession) should be applied to the IGH using the total precession correction portion of the AF IMT 4116.

11.14.6.6.2. If the precession rate changes at subsequent heading checks, it may be advisable to adjust previous DR and air plot positions described at **paragraph 11.5.7.6**.

11.14.7. Miscellaneous Procedures:

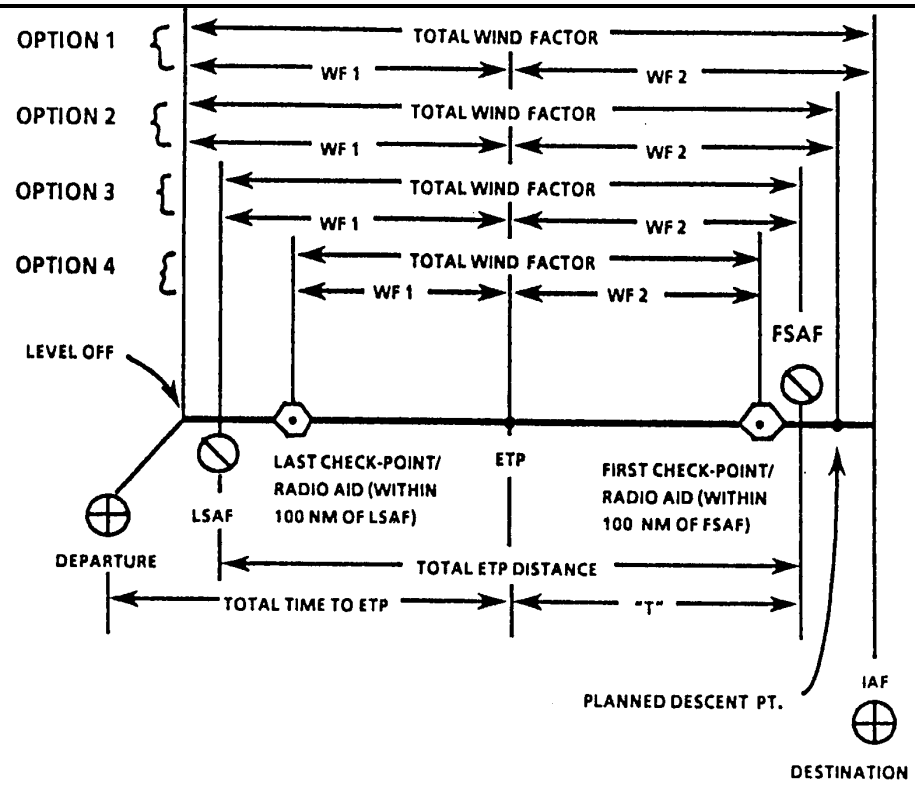
11.14.7.1. Normally, when changing charts or crossing the 180 degree meridian, only the reference changes; the heading of the aircraft is not altered. The change is made by comparing the grid courses and applying the difference to the gyro reading (old chart GC 350 degrees; new chart GC 331 degrees; GR 353; 350 - 331 = 019 = 334; reset the gyro to read 334).

11.14.7.2. Do not use the combined rhumb line/coriolis correction when flying DG. Use only coriolis correction for celestial observations.

11.14.7.3. Always recheck computations and formulas when a radical change in precession is observed.

11.14.7.4. Grid qualified navigators will maintain proficiency in grid procedures.

Figure 11.1. ETP Computations.



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

   A. TOTAL WIND FACTOR:

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

   AVERAGE GS - PLANNED AVERAGE TAS = TOTAL WIND FACTOR

   B. FIRST HALF WIND FACTOR (WF 1):

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

   AVERAGE GS - PLANNED AVERAGE TAS = WF 1

   C. SECOND HALF WIND FACTOR (WF 2):

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

   AVERAGE GS - PLANNED AVERAGE TAS = WF 2

2. ETP COMPUTATION:

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

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

Figure 11.2. Example AF IMT 4116.

C-130 NAVIGATOR FLIGHT PLAN AND LOG

I. FLIGHT DATA

HIGHEST ACC FL:

AIRCRAFT COMMANDER: CAPT HANS O'BRICK

NAVIGATOR: LT BAG O'DONUTS

DATE: 1 NOV 04

PARKING SPOT: G-4

KCHS

TO:

AIRCRAFT TAIL #: 64-0527

T/O TIME

PROPOSED: 1320

ACTUAL: 1300

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

Figure 11.2. Log Example (Continued)

II. FUEL/ETP PLANNING		
NAV: LT BAG O'DONUTS	OPERATING WT:	86.0
AC: CAPT HANS O'BRICK	CARGO/PAX WT:	10.0
TAIL #: 64-0527	RAMP FUEL:	59.0
DATE: 1 NOV 04	RAMP WT:	155.0
CALLSIGN: REACH 4527	TAKEOFF WT:	153.7

		TIME	FUEL
1. ENROUTE		8+32	39.6
2. RESERVE		+45	3.3
3. ENROUTE + RESERVE		9+17	42.9
4. ALTERNATE + MISSED APPROACH		+31	2.2
5. HOLDING	2.0 / 3.5		2.0
6. APPROACH/ LANDING	1.0/4.0		5.0
7. IDENTIFIED EXTRA		5 PAX	0.0
TOTAL (3+4+5+6+7) 8. TAKEOFF			52.1
9. TAXI	1.3		1.3
10. REQUIRED RAMP			53.4
11. ACTUAL RAMP		ENDURANCE 12+46	59.0
12. UNIDENTIFIED EXTRA			5.6
MIN DIV OR (4+5+6+ WRF) 13. REQ OVHD DEST			9.2

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

NAVIGATOR SIGNATURE
Joseph Bag O'Donuts

CLIMB TEMP DEV: +05	CRUISE TAS	CRUISE CEILING	DRAG INDEX
CRUISE TEMP DEV: +05	270	17.0	+17
DISTANCE TO CLIMB (DTC) 97 NM	TIME TO CLIMB (TTC) +37	CLIMB TAS 195	FUEL TO CLIMB (FTC) 2450

ENROUTE FUEL COMPUTATION WORKSHEET

ZONE	GROSS WEIGHT	ALT	ZONE TIME	TOTAL TIME	F/F PER ENGINE	F/F TOTAL	ZONE FUEL	TOTAL FUEL
A. CLIMB	153.7	↗	IN MINS	+37			2450	
TTL CLIMB FUEL	- 2.5							
B. START CRUISE	151.2	17.0	482	512	1230	4920	39.5	
CRUISE ZONE FUEL	- 39.5			D. AVG CRUISE FUEL FLOW →		4620	37.1	39.6
C. END CRUISE	111.7	17.0			1080	(TFF) 4320		

ETP CALCULATION

LSAF	MDPT		FSAF
KCHS	N 38-17	W 053-00	LPLA
DIST 1360	TIME 4+36	DIST 2597	TIME 8+32
- 91	- 30	- 1360	- 4+36
= 1269	= 4+06	= 1237	= 3+56
GS 310	WF1 +40	GS 315	WF2 +45

DIST (LSAF TO FSAF) (2597) T(286)MIN
(WF2-WF1) + 2(TAS) (545) = ^60
TOTAL TIME TO FSAF - T = TIME TO ETP
8+32 - 4+46 = 3+46
ETP METHOD (1) 2 3 4 (CIRCLE ONE)

ENROUTE FUEL FORMULAE

CLIMB DISTANCE / CLIMB TIME = CLIMB TAS / 60

FUEL FLOW (FFT) / 60 X ZONE TIME (IN MINS) = ZONE FUEL

START CRUISE FF + END CRUISE FF / 2 = AVG CRUISE FF

FUEL FLOW PER ENGINE X 4 = FUEL FLOW TOTAL

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

Figure 11.2. Log Example (Continued)

IV. TAS CHECK

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

STANDARD TEMPERATURES

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

HEAT OF COMPRESSION

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

V. DEVIATION CHECK

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

VII. IN-FLIGHT FUEL MANAGEMENT

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

VI. FIX/COMPUTER POSITION

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

VIII. RADAR/NAVAID DATA

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

Figure 11.2. Log Example (Continued)

IX. IN-FLIGHT DATA

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

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

Figure 11.3. ARA Pattern Construction Procedures.

ARA CONSTRUCTION PROCEDURES

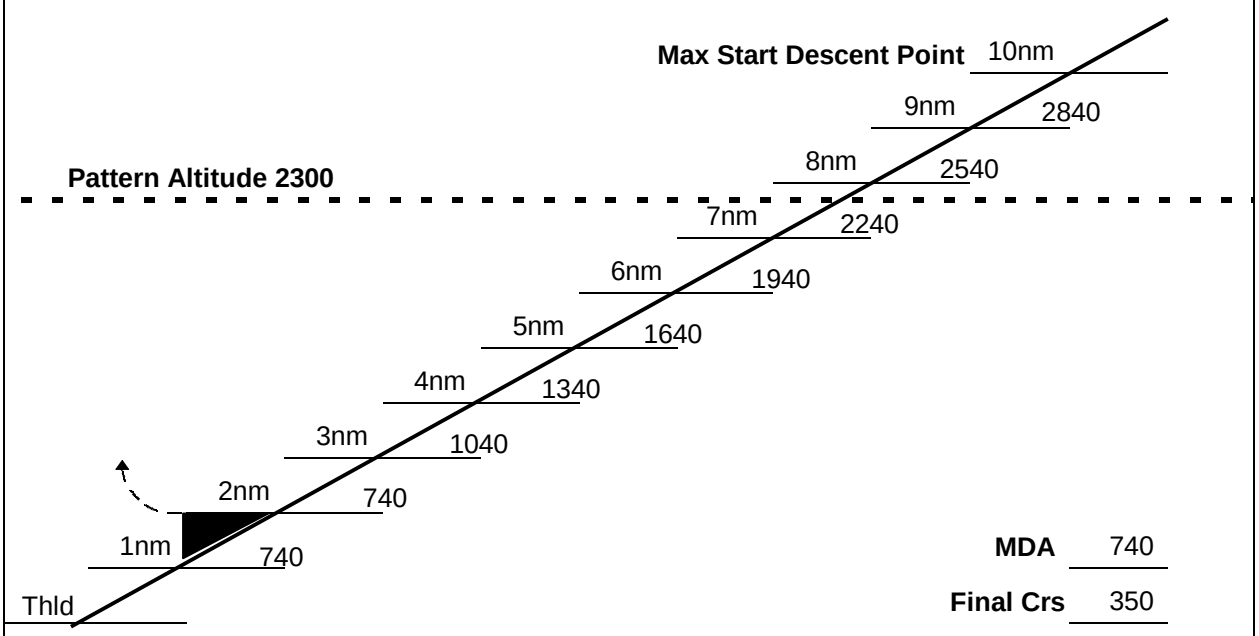
BRIEFING ITEMS
- Approach
- Minimums
- Missed Approach
- Landing Runway
- Timing
- Terrain

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

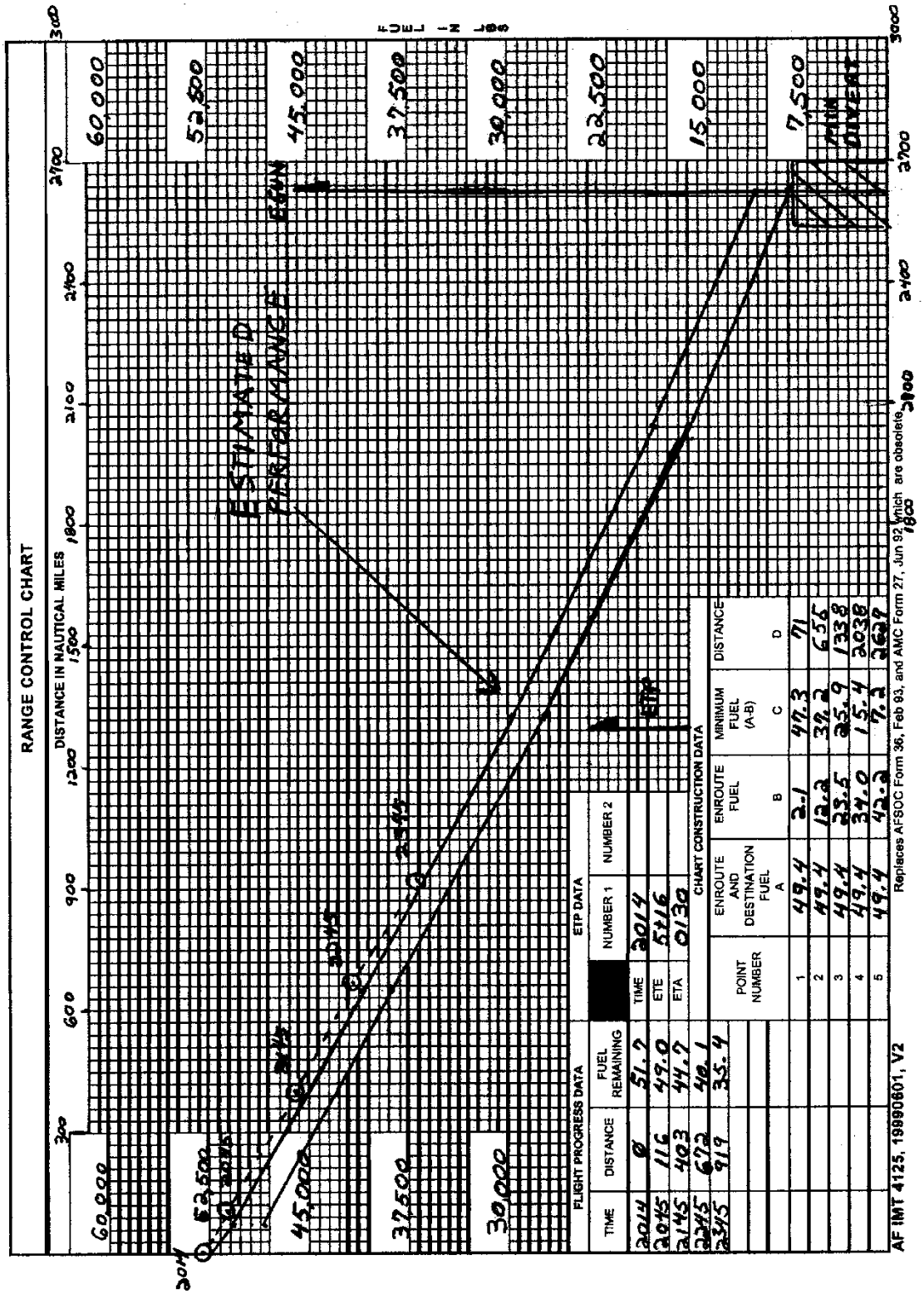
Add "A" to alt above to build glideslope. Brief and fly ARA



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 11.4. AF IMT 4125, Range Control Chart.



Chapter 12

FLIGHT ENGINEER/AIRCREW MAINTENANCE SUPPORT PROCEDURES

12.1. General. This chapter contains flight engineer procedures not contained in the flight manual, other portions of this AFI, or other publications.

12.2. Responsibilities. The flight engineer is responsible to the PIC for all inspections and procedures required by the applicable technical orders and regulations.

12.3. Authority to Clear Red X Symbols. Flight engineers are not normally authorized to clear a Red X. If a situation is encountered where the aircraft is on a Red X and qualified maintenance personnel are not available to clear it, the flight engineer may obtain authorization to clear the Red X from the home station MXG/CC or designated representative in accordance with TO 00-20-1. Other crewmembers are not authorized to clear a Red X. Flight engineers and maintenance personnel are not authorized to clear a Red X caused by CBRNE contamination (see **paragraph 10.5.9**). ***EXCEPTION:*** The flight engineer may clear Red Xs for engine panels and covers, pitot covers, gear pins, and SPR drains when qualified maintenance personnel are not available, unless prohibited by the home station MXG/CC or OG/CC or designated representative.

12.4. Aircraft Servicing. Flight engineers are normally not required to refuel or de-fuel aircraft; however, the flight engineer is qualified and authorized to accomplish these duties when maintenance personnel are not available. This policy is designed for support of the aircraft and its mission while away from home station. TO 00-25-172, and TO1C-130H-2-12JG-10-1 will be used during all servicing operations. If ground support personnel are not available, the PIC will designate other crewmembers to assist the flight engineer. A flight engineer may assist the normal maintenance function when critical contingency tasking dictate their use, provided this action does not impact crew duty and crew rest limits specified in **Chapter 3**.

12.4.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed.

12.4.1.1. AMC program aircraft are authorized to use JP-8+100. C-130 units at bases with JP-8+100 are program aircraft and may use either JP-8+100 or JP-8.

12.4.1.2. AMC non-program aircraft will not operate on JP-8+100, except in emergency conditions. Non-program C-130 units will not use JP-8+100 and will make all efforts to avoid refueling with JP-8+100. JP-8+100 locations are required to maintain a clean JP-8 capability to support transient aircraft. If JP-8+100 refueling occurs comply with the following:

12.4.1.2.1. De-fuel the aircraft prior to flight.

12.4.1.2.2. Make an AFTO Form 781 entry stating “Caution: Aircraft refueled using JP-8+100, preventative measures must be taken when de-fueling.”

12.4.1.3. When crewmembers are required to refuel, the flight engineer will act as the refueling team supervisor. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-172 and applicable T.O. 1C-130xx series T.O.s.

Two other crew members are required to assist in the refueling, one for safety duties and the other to act as fire guard.

12.4.2. Concurrent Ground Operations. The PIC and Concurrent Servicing Supervisor (CSS) shall ensure aircrew members and servicing personnel accomplish concurrent servicing (CS) in accordance with T.O. 00-25-172 and servicing technical orders. Aircrews performing Dash-1 preflight inspections or cargo loading concurrent with servicing must have cooperation and close coordination with the CSS. The CSS will remain in continuous intercom contact with fuel servicing team members during the entire servicing operation. Team members include CSS, Single Point Refueling (SPR) monitor, refueling panel monitor, fuel specialists, and one person to monitor the opposite side wing fuel vents. When the aircrew is at the aircraft, the PIC is responsible for all aspects of aircraft operations and shall inform the CSS how aircrew members will participate in passenger evacuation/safety. In keeping with the guidelines in T.O. 00-25-172, CSS has authority over all phases of CS operations to include personnel participating in the refuel.

12.4.2.1. Use the following guidelines when CS operations are conducted with passengers on board:

12.4.2.1.1. A current and qualified crew member will be designated the passenger compartment monitor (PCM) and shall continuously monitor passengers during CS. PCMs will not perform other duties during servicing.

12.4.2.1.2. Designate a current and qualified crew member to remain on the flight deck to monitor interphone and be prepared to broadcast a request for emergency assistance on a radio tuned to the appropriate agency with ready access to an emergency response team. The PA may be used to direct passenger evacuation in an emergency.

12.4.2.1.3. The PCM shall brief passengers on emergency egress, exits, prohibitions, and hazards. Passengers will remain seated but will not wear seat belts during CS. When possible, conduct this briefing prior to servicing. If servicing is in progress, the briefing will be given immediately after boarding.

12.4.2.1.4. When authorized, passengers may board or exit the aircraft for the express purpose of loading for departure or off-loading upon arrival. Boarding or exiting must be opposite of servicing operations. Once onboard, except for emergencies, passengers shall not deplane once servicing commences.

12.4.2.1.5. Passengers are not required to ground themselves.

12.4.2.1.6. Passenger representatives will assist the PCM when passengers board and exit. Passengers must remain outside the vapor hazard area, the fuel servicing safety zone, oxygen servicing area, and 25 feet from fuel vents during servicing.

12.4.2.1.7. The PIC, or designated aircrew representative, or CSS will advise PCMs when to evacuate passengers.

12.4.2.1.8. Unless environmental conditions dictate, the primary emergency exit will remain open and stairs in place.

12.4.2.1.9. The PCM shall set the interior lighting as bright as possible to suit the combat environment.

12.4.2.1.10. The loadmaster shall ensure cargo loading or unloading does not jeopardize passenger safety. Winching is prohibited. Do not load/unload cargo containing explosives, oxygen, flammable gases or liquids during CS.

12.4.2.2. Simultaneous fuel and oxygen servicing is not authorized.

12.4.2.3. Winching of rolling stock and non-spark producing (i.e. wooden) pallets is authorized. Driving vehicles equipped with spark arresters is authorized during fuel servicing. When loading vehicles without spark arresters, the vehicles must be either completely inside the cargo compartment, or outside of the established fuel servicing safety zone, before fuel servicing lines can be pressurized. ***EXCEPTION:*** Diesel and turbo-charged (without waste gates) gasoline-powered vehicles can be on-loaded or off-loaded without having to stop fuel flow.

12.4.3. The following guidance will be used for fuel servicing (refuel) operations only:

12.4.3.1. Electric and electronic equipment may be left on provided it does not radiate energy; but it must not be turned on or off during refueling.

12.4.3.2. TACANs and radar altimeter must be turned off.

12.4.3.3. Radar may be in standby but, if time permits, should be turned off.

12.4.3.4. IFF/SIF may be in standby but, if time permits, should be turned off.

12.4.3.5. SCNS/INU may be "on" and may be updated. Do not turn on or off during refuel operations.

12.4.4. Hot Refueling. Hot refueling (refueling with aircraft engines running) will only be conducted by crews that have been authorized and certified according to AFI 11-235, *Forward Area Refueling/Rearming Point (FARRP) Operations*.

12.4.5. DELETED

12.4.5.1. DELETED

12.4.5.2. DELETED

12.4.6. 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. Not Used.

12.6. Aircraft Structural Integrity Program. Complete aircraft data, IAW TO 1C-130-101 on all flights.

12.7. Aircraft Systems/Forms Management.

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

12.7.2. In addition to the procedures in TO 00-20-1 and AFI 11-401, the flight engineer will assist the pilot in maintaining the AFTO IMT 781.

12.8. Performance Data Computations.

12.8.1. TOLD computations will be placed on AF IMT 4063 and AF IMT 4064.

12.8.2. All performance calculations will be based on 95 percent engines. TOLD card computations will be accomplished using flight manual performance data or approved tabulated data.

12.8.3. When conducting flaps up landing data for training, compute and post V_{MCA} speeds for both configurations; flaps 50% and flaps up (normal boost). Example, $V_{MCA,}$ in ground effect, one engine inoperative – 105/122.

12.8.4. Minimum TOLD requirements for a termination landing are: Air Minimum Control Speeds, Obstacle Clearance Speed, 3 Engine Climb Speed, 100 & 50% Flap Landing Speeds and Distances, 0% Flap Landing Approach Speed (Night or IMC), and 3 Eng FTPNM.

12.9. AF IMT 4108, C-130 Fuel Log. The purpose of the form is to provide an orderly method of recording fuel consumption and aircraft gross weight. The following instructions standardize procedures for the completion and disposition of AF IMT 4108:

12.9.1. The AF IMT 4108 will be completed whenever the navigator completes AF IMT 4116, **C-13O Flight Plan and Record**. The log maybe filled out as necessary to accomplish training or corrective action.

12.9.1.1. When the fuel log is completed, it is not required to fill out the reverse side of the AF IMT 4063.

12.9.2. Responsibility:

12.9.2.1. The flight engineer will complete the AF IMT 4108.

12.9.2.2. Return completed forms to the unit of the individual completing the form. The squadron flight engineer supervisor will maintain completed forms for 6 months.

12.9.3. Additional Information. AF IMT 4108 provides as a simple method of recording aircraft fuel data and is adequate for normal operational requirements. When additional information is required for identifying trends in engine failure or performance or for special test programs, the directing headquarters will furnish necessary forms and instructions to complete the program.

12.9.4. Instructions. Form heading entries are self-explanatory.

12.9.4.1. Block 1-FUEL GAGE POUNDS. Record fuel quantity from the fuel quantity indicators before and after flight. This reading is normally taken prior to engine start with the indicators powered and after flight prior to power being removed from the indicators.

12.9.4.2. Block 2-WEIGHT DATA. Record operating weight and cargo weight (including passenger weight) from DD Form 365-4. Ramp fuel weight is obtained from block 1 (Fuel Gage). The blank space may be used for last minute changes prior to engine start or as required.

12.9.4.3. Block 3-FUEL ON/OFFLOAD. Enter total weight of fuel on or offload during air refueling in this block.

12.9.4.4. Block 4-PAX/CARGO OFFLOAD. Enter total weight of passengers and cargo extracted during flight in this block.

12.9.4.5. Block 5-ENGINE START Z. Enter Greenwich mean time (GMT) of last engine started.

12.9.4.6. Block 6-COND. Enter symbol depicting flight condition as follows:

12.9.4.6.1. WU/TAXI/TAKEOFF-Indicates warm-up taxi and takeoff conditions.

12.9.4.6.2. 1 Climb. Initial climb is indicated by symbol (1). Secondary and subsequent climbs are shown as (2, 3, etc.). The number here indicates sequence of condition in flight profile. This is also true of cruise segments and descents. Climbs of 4,000 feet or less will not be recorded separately but will be included in preceding cruise increments. When constant climb is maintained to cruise altitude, use fuel flow reading taken at 2/3 climb altitude. When constant climb cannot be maintained to cruise altitude due to air route traffic control (ARTC) clearances, etc., enter difference between sum of individual fuel quantity gage readings at beginning and end of climb.

12.9.4.6.3. Cruise operating conditions are indicated by the number in cruise sequence and an arrow (1, 2, 3, etc.). Instrument readings will be averaged for this period. Normally, cruise entries will be no more than 1 hour. However, the first cruise, the cruise immediately prior to en route or step climb and/or the last cruise prior to descent, may be no less than 30 minutes, nor more than 1 hour and 30 minutes.

12.9.4.6.4. Descents are shown as (1, 2, 3, etc.). Do not confuse descent with the final letdown that occurs when your landing procedures begin. The loss in altitude during final letdown is indicated by “L & T.” Landing and taxi is that condition from the end of the last entry in the sequence of descents to engine shutdown on the ramp. Holding time, however, must he accounted for as an additional cruise () condition after descent when necessary. Descents of 4,000 feet or less will not be recorded separately but will be indicated in the preceding cruise increment. When descent exceeds 4,000 feet, blocks 10 through 18 need not be completed.

12.9.4.6.5. AR-Air Refueling Tanker Operation, ARR Air Refueling Receiver Operation. Cruise, climb, or descent to refueling altitude (end this condition approximately at start of on/offload of fuel.) Indicate AR and ARR 1, 2, etc., in condition block, for refueling condition. Blocks 10 through 18 need not be completed. Blocks 19, 20, 22, 25, and 28 entries are not required for ARR. At completion of on or offload of fuel, a new cruise, climb, or descent condition will be initiated. NOTE: Rescue. search, storm penetration, combat/combat support, or any special mission which requires constant variations in altitude and airspeed may use the same procedures as air refueling operations. For this type of condition use an “S” in the condition block.

12.9.4.7. Block 7-END. Enter GMT for end of condition.

12.9.4.8. Block 8-SET. Enter increment time duration for the condition for WU/TAX/TO. All warm-up and taxi times will be entered in the circle of the SET block. Takeoff time is computed from brake release to the first change of power (when reduced power procedures are used, compute take-off time using 2 minutes).

12.9.4.9. Block 9-TOTAL. Enter cumulative total time of SET time, excluding the warm-up and taxi times entered in the circle SET time.

12.9.4.10. Block 10-OATI. Enter indicated outside air temperature reading.

12.9.4.11. Block 11-OAT/VAR:

12.9.4.11.1. OATC. Enter corrected outside air temperature as determined from the appropriate performance manual.

12.9.4.11.2. VAR. Enter temperature variation from standard International Civil Aviation (ICAO) temperature.

12.9.4.12. Block 12-HP. Enter the pressure altitude for the condition with altimeter set at 29.92 Hg.

12.9.4.12.1. For climb, enter HP for 2/3 the intended climb as soon as the altitude to which the climb is to be made is known. The entry (2/3 HP) reflects pressure altitude for 2/3 of the actual climb. If a climb starts at 15.000 feet and terminates at 30,000 feet, you compute the pressure altitude for 2/3 of the 15,000 difference, which is 10,000 feet. This HP added to the 15,000 foot beginning HP equals 25,000 feet HP, which is the appropriate entry for this climb.

12.9.4.12.2. For cruise, enter the actual HP.

12.9.4.12.3. When descent exceeds 4,000 feet, blocks 10 through 18 need not be completed.

12.9.4.13. Block 13-CRUISE CEILING. Enter 4-engine cruise ceiling for the aircraft from the appropriate performance manual.

12.9.4.14. Block 14-CRUISE IAS. Enter indicated airspeed from the appropriate performance manual required to maintain desired true airspeed.

12.9.4.15. Block 15-TORQUE. Enter torque value from the appropriate performance manual required to maintain the desired true airspeed.

12.9.4.16. Block 16-3-ENGINE SERVICE CEILING. Enter 3-engine service ceiling from the appropriate performance manual.

12.9.4.17. Block 17-3-ENGINE DRIFTDOWN IAS. Enter the 3-engine driftdown indicated airspeed from the appropriate performance manual.

12.9.4.18. Block l8-ENGINE INST F/F LBS/HR. Enter the average individual fuel flow reading and total for the period. Engine instrument fuel flow (lbs/hr) will be the complete figure (4800 not 4.8).

12.9.4.19. Block 19-PERIOD (FUEL USED). Enter fuel used for engines for the period as computed using total of fuel flow readings. ***NOTE:*** For fuel used during WU/TAXI, use 50 pounds per minute. For fuel used during TAKEOFF, use 300 pounds. Enter all fuel used, fuel remaining, and gross weights in thousands. ***EXAMPLE:*** 127,300 = 127.3. All weights are to be carried to the nearest hundred. ***EXCEPTION:*** Engine instrument fuel flow (lbs/hr) will be a complete figure.

12.9.4.20. Block 20-EXTRA (FUEL USED). Enter extra fuel used during flight condition period for fuel jettisoning, APU, etc. Fuel transferred to a receiver during air refueling will be entered in this block.

12.9.4.21. Block 21-TOTAL (FUEL USED). Enter cumulative total of fuel used for successive conditions. This block represents all fuel consumed to END clock time entered in block 7. ARR (receiver) start new condition (cruise, climb, or descent) after refueling with "O" (zero) fuel used.

12.9.4.22. Block 22-PERIOD (CALC FUEL REMAINING). Enter the amount of fuel consumed (block 19 plus block 20) for flight condition as determined by calculation.

12.9.4.23. Block 23-TOTAL (CALC REMAINING). Enter the total amount of the calculated fuel remaining by subtracting the amount in block 22 from the amount of calculated fuel remaining at END clock time entered in block 7. ARR (receiver) condition. Enter cumulative total of fuel (indicated by individual gage readings) on board airplane after refueling.

12.9.4.24. Block 24-This block is unlabeled to facilitate entering the total ramp fuel from block 2, WEIGHT DATA. Enter the ramp calculated fuel aboard, obtained by either measurement with a dipstick and applying any known correction factor or as indicated by total of fuel quantity indicators. On reverse side of form, this block is used to carry forward previous quantity from front side of form.

12.9.4.25. Block 25-GAGE PERIOD (GAGE FUEL REMAINING). Enter the period fuel used for flight condition as determined by the fuel gage readings for present condition compared to the fuel gage reading for previous condition. For fuel used during WU/TAXI, use 50 pounds per minute. For fuel used during TAKEOFF, use 300 lbs.

12.9.4.26. Block 26-TOTAL (GAGE TOTAL). Enter total of fuel as indicated by the individual quantity gages. ARR (receiver) condition. Enter cumulative total of fuel (individual gage readings) onboard airplane after refueling.

12.9.4.27. Block 27-This block is unlabeled to facilitate entering total ramp fuel from Block 2. WEIGHT DATA. Enter the ramp calculated fuel aboard obtained by either measurement with the dipstick and applying any known correction factor or as indicated by the total of fuel quantity indicators. On reverse side of the form this block is used to carry forward previous quantity from the front side of the form.

12.9.4.28. Block 28-FUEL USED. Enter the fuel used from total of blocks 19 and 20.

12.9.4.29. Block 29-ON/OFFLOAD. After the aerial delivery of troops or equipment or after aerial refueling, enter the weight loss or gain to properly indicate actual gross weight of airplane in block 30.

12.9.4.30. Block 30-END GROSS WEIGHT. Enter the aircraft gross weight at end of period. This weight is found by subtracting fuel used for this period (Block 21) from previous ending gross weight. If entry was made in block 29 (ON/OFFLOAD), this weight must also be added or subtracted from the previous ending gross weight to arrive at correct END GROSS WEIGHT figure.

12.9.4.31. Block 31-. This block is unlabeled to facilitate entering total ramp gross weight from Block 2. WEIGHT DATA. On reverse side of form, this block is used to carry forward previous weight from the front side of form.

12.9.4.32. Block 32-REMARKS. Enter any remarks or observations, including instrument readings pertinent to flight, which you feel noteworthy.

12.10. Tactical Checklist. When the pilot or navigator, as required, initiates a tactical checklist, the flight engineer will read and ensure timely completion of all checklist items.

Section 12A---*Hostile Environmental Repair Procedures*

12.11. General. Authority to use the Hostile Environment Kit and Repair Procedures is granted by Operations Group Commander/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 dictates 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 Environmental Repair Procedures. When Hostile Environmental Repair Procedures are actually employed, inform MAJCOM Stan/Eval by letter. Include a brief description of the circumstances and conditions leading to the decision to approve Hostile Environmental Procedures.

Chapter 13

CARGO AND PASSENGER HANDLING PROCEDURES

13.1. General. The loadmaster coordinates loading or offloading with air terminal operations centers or shipping agencies; plans loads; and supervises loading or offloading operations. Performs preflight and postflight of aircraft and systems, and computes aircraft weight and balance. Provides for safety and comfort of passengers and troops, and security of cargo, mail, and baggage during flight. Prepares and rigs equipment for airdrop, and participates in the aerial delivery of equipment, supplies, and personnel.

13.2. Responsibilities of Aircraft Loading.

13.2.1. AMC Designated Stations.

13.2.1.1. Air freight personnel are responsible for selecting cargo and mail for airlift, promptly completing documentation, palletizing cargo, load planning, computing load distribution, and moving cargo to and from the aircraft to meet scheduled departure. They will advise the loadmaster of destination, size, weight, and type of cargo (classified, hazardous, etc.) before starting loading operations to permit proper positioning. They will also coordinate traffic activities affecting loading and offloading and assign sufficient air freight loading personnel for cargo handling. Air freight personnel are responsible for safe positioning of material handling equipment and cargo to or from the aircraft cargo door, ramp, or auxiliary ground loading ramps. Under supervision of the loadmaster, air freight personnel prepare the aircraft for loading, stow loading/tiedown equipment if the aircraft is not to be reloaded, physically load the aircraft and tie down cargo and equipment, and release tiedown and physically offload cargo.

13.2.1.2. The loadmaster is responsible for aircraft preflight, load planning; preparation of DD365-4, **Weight and Balance Clearance Form F-Transport/Tactical**; certifying load plans; operating aircraft equipment; supervising and directing loading and offloading operations; and cargo tie down. He or she coordinates with the loading crew supervisor to verify cargo against manifests. The loadmaster supervises loading operations and is responsible for safe movement of cargo into and out of the aircraft. The loadmaster will notify the PIC, command post, or terminal operations officer if loading personnel are injured or cargo, aircraft equipment, or aircraft structure is damaged during loading or offloading. The loadmaster will brief the PIC on any hazardous cargo and cargo jettisonability prior to engine start.

13.2.1.3. Loads planned by qualified load planners will be accepted by the aircraft loadmaster and loaded aboard the aircraft as planned, unless the load or any portion of it will compromise flight safety or does not comply with applicable aircraft technical orders or USAF and MAJCOM publications. If cargo is refused or rearranged for these reasons, forward all applicable information, including a copy of the load plan, to MAJCOM standardization and evaluation through standardization channels. AMC personnel attach an AMC IMT 54, **Aircraft Commander's Report on Services/Facilities**. ***EXCEPTION:*** The aircraft loadmaster may deviate from load plans to facilitate ease of on-load or off-load of cargo and to alleviate unnecessary aircraft reconfiguration without submitting documentation. The aircraft loadmaster must take into consideration the next

station's cargo configuration requirements and will ensure the aircraft is in proper weight and balance limits. A new load plan is not required for this exception.

13.2.1.4. The loadmaster is the on-scene expert for load planning and accepting cargo for airlift. Some loads are not specifically detailed in applicable directives and require the loadmaster to use his or her best judgment, based on training, experience, and knowledge, to determine the best and safest method of loading the cargo. When difficulties arise, they should seek advice of other personnel (i.e., available loadmasters and squadron, group, wing, NAF, or MAJCOM standardization personnel).

13.2.2. At locations without AMC air terminal or traffic personnel, the shipper assumes responsibilities as described in **paragraph 13.2.1.1** and provides sufficient qualified personnel and material handling equipment for loading or offloading. Loadmaster's responsibilities and authority are the same as described in **paragraphs 13.2.1.2** and **13.2.1.3**.

13.2.3. During JA/ATT, SAAM, USAF mobility, and contingency missions, the loadmaster can accept DD2133, **Joint Airlift Inspection Record**, as a valid pre-inspection of equipment being offered for air shipment. This form, validated by two joint inspection signatures (user and transporting force), may be used in lieu of the applicable portions of the T.O. 1C-130A-9CL-1. The DD Form 2133 will not be used to document preparation of hazardous materials. This will be accomplished using the Shipper's Declaration for Dangerous Goods.

13.3. Emergency Exits and Safety Aisles. Safety aisles will be according to AFI 11-2C-130V3, Addenda A, *C-130 Configuration/Mission Planning*, and this chapter.

13.3.1. When passengers are seated in side facing seats, the loadmaster will ensure there is sufficient space between the cargo and the seats to permit passenger leg room. ***NOTE***: All passenger hand-carried 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. Passengers/ambulatory patients may not be seated closer than 30 inches in front of palletized netted cargo or cargo secured with straps. When the cargo, either palletized or non-palletized, is secured with chains, the 30-inch spacing is not required.

EXCEPTION: Maintain 30 inch spacing on AE missions, when carrying occupied litters.

13.3.3. DELETED

13.4. Pre-mission Duties.

13.4.1. Cargo Missions.

13.4.1.1. Aircraft loadmasters in coordination with aerial port personnel establish loading times. Loading times that differ from the normal pre-departure sequence will be established, with PIC coordination, before the loadmaster enters crew rest. Loading time is governed by the type of load and complexity of loading procedures (bulk, palletized, etc.) not by port saturation or management of aerial port workload levels. When reporting for duty, the loadmaster checks in with the ATOC or other designated location to obtain load breakdown and assist in load planning as required.

13.4.1.2. Proper cargo documentation must accompany each load. A consolidated statement (manifest) will be delivered to the aircraft prior to departure unless one is not

available due to a lack or failure of the manifest processing equipment. In this case, a cargo listing or electronic storage medium containing manifest information must accompany the load.

NOTE: Computer generated load plans are not an acceptable substitute for proper cargo documentation described above. Computer generated load plans are acceptable as manifests for unilateral training loads.

13.4.1.3. Make every effort to exchange tiedown equipment on a one-for-one basis. If this is not possible, annotate the AF IMT 4069, **Tiedown Equipment Checklist**. At non-AMC stations, 463L pallets will normally be exchanged on a one-for-one basis.

13.4.2. Passenger Missions. Maximize seat availability on all missions. It may be necessary for crews to perform passenger service functions at stations that do not have this capability. These functions include manifesting, anti-hijacking processing, and ensuring visa/passport requirements are met. Do not hesitate to contact 618 TACC/XOGX, Aerial Port Control Center; DSN 779-0350/0355, commercial (618)229-0350/0355, if any questions arise such as to who may travel to specific locations or passport/visa requirements. Aircraft operating within other MAJCOMs that have operational C2 over that aircraft will contact the appropriate C2 agency for specific details. File a copy of the passenger manifest with the most responsible on-scene agency if there is no base operations, or other agency responsible for filing the manifest.

13.4.2.1. Manifesting. Passenger service or base operations personnel manifest passengers at locations with an AMC passenger processing activity.

13.4.2.1.1. The PIC and loadmaster are responsible to ensure all passengers are properly manifested.

13.4.2.1.2. At locations without an AMC passenger processing activity, aircrew will manifest all passengers using DD2131, **Passenger Manifest**, and leave a copy of the manifest with the flight plan. If not filed with the flight plan, annotate the location of the manifest on the flight plan IAW AFI 11-202V3.

13.4.2.1.3. When the aircrew accomplishes manifesting, anti-hijack-processing will also be completed by the aircrew IAW AFI 13-207.

13.4.2.2. Ensure all food items are removed from the aircraft by fleet and returned to the in-flight kitchen if an extended delay occurs. Ensure that a copy of AF IMT 129, **Tally In-Out**, is received from fleet to relieve the loadmaster of meal accountability.

13.4.2.3. Complimentary snacks and beverages are authorized on TWCF funded missions (including ANG and AFRC flown missions) for passenger consumption only. Complimentary snacks are not authorized on JA/ATT, Joint Chief of Staff (JCS) exercises, or SAAM missions. The squadron or port operations officer will ensure snacks and beverages are placed on board when departing AMC stations. When departing from other stations and no snacks or beverages are to be placed onboard, the loadmaster may obtain required snacks and beverages from the local in-flight kitchen. Direct the in-flight kitchen to bill the accounting and finance office at the aircraft's home station. Record all unused snacks and beverages on AF IMT 129 and return to the in-flight kitchen for turn-in credit.

13.4.2.4. Ensure the auxiliary power unit/gas turbine compressor is shut down before boarding passengers unless adequate hearing protection is provided. A passenger service representative or crew member will assist passengers at the bottom of the steps, and the loadmaster will assist in seating passengers. Ensure that only adult, English-speaking passengers are seated next to emergency exits. Do not seat mothers with infants, children under 15 years old or physically challenged persons in seats adjacent to emergency exits. Make every effort to seat families together.

13.4.2.5. When children under the age of two are accepted as passengers, their sponsor has the option to either hold the child or place him or her in a Department of Transportation-approved Infant Car Seat (ICS). Although the use of ICS for children processed through AMC-owned or controlled terminals (including gateways) is no longer mandatory, all passengers (duty and space A), regardless of age, are required to be assigned their own seat. This policy will provide an infant and their sponsor with a dedicated seat allowing the use of an ICS at the sponsor's discretion; this mirrors current FAA (commercial) standards. The FAA has banned the use of booster seats, harnesses, and vest child restraints.

13.4.2.5.1. Passengers may hand-carry their ICS. If used, these seats will be secured to a seat using the seat belt. Adults will not hold infant seats during any phase of flight.

13.4.2.5.2. If the mission aircraft is equipped with aft facing "airline style" seats, secure the seat in the same manner as in an automobile. However, if the aircraft is configured with side-facing seats, aircrew must ensure the ICS is adequately secured. The design of the sidewall seatbelt makes it difficult to remove enough slack to secure the ICS. Crewmembers may need to reroute the seatbelt by crossing the belt, between the sidewall and the seatback webbing, routing the belt back through the webbing and through the securing point on the ICS. When removing slack from the seatbelt ensure the buckle remains on one side or the other so that it can be easily accessed for release. The PIC is the final authority for determining whether the ICS is adequately secured.

13.4.2.6. Download the baggage of no-show passengers and those removed from a flight. In the case of SAAM or exercise missions at non-AMC locations, coordinate with Tanker Airlift Control Elements or deploying unit commanders to decide if downloading of baggage is necessary.

13.4.2.7. RUSH baggage movement will be accomplished IAW AMCI 24-101V15, *Military Airlift - Baggage Service*. The loadmaster will ensure ATOC provides a copy of the AMC IMT 70, **Rush Baggage Manifest**, for the shipment of rush baggage.

13.5. Passenger Handling.

13.5.1. The loadmaster is the key to good passenger relations. The following common sense rules should be observed:

13.5.1.1. Address passengers by proper titles.

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

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

13.5.2. Comments by the loadmaster 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.

13.5.3. In-flight Procedures.

13.5.3.1. Passengers may move about the cabin after reaching cruise altitude; however, judgment must be exercised on the number of passengers allowed out of their seats at any one time. Encourage passengers to remain seated with their seat belts fastened. Due to concern for their safety, passengers are not allowed to lounge or sleep on cargo or baggage. ***WARNING*** : Serious injury may occur if passengers do not have their seat belts fastened and the aircraft encounters moderate or severe turbulence.

13.5.3.2. Make frequent checks on the following:

13.5.3.2.1. Cabin temperature.

13.5.3.2.2. Passengers with small children.

13.5.3.2.3. Cleanliness of the cabin and lavatories.

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

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

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

13.5.4. Meal Service.

13.5.4.1. Meals are served at normal hours when practical, based on the local time at point of departure. Avoid waking passengers to offer meals. Ask the PIC about expected flight conditions prior to meal preparation.

13.5.4.2. Passengers having a boarding pass, AMC Form 148, **Boarding/Pass Ticket**, showing a meal was ordered are served meals in the following sequence:

13.5.4.2.1. Small children requiring assistance.

13.5.4.2.2. Distinguished Visitors (DV).

13.5.4.2.3. All other passengers.

13.5.4.3. Use the following procedures for box lunches:

13.5.4.3.1. After takeoff, distribute box lunches to passengers who boarded at the previous station. This lessens confusion when flight segments are short and passengers board at subsequent stations.

13.5.4.3.2. Ensure each passenger receives the meal ordered by verifying the passenger's AMC Form 148.

13.5.4.4. Do not serve liquids or hot food during turbulence.

13.5.4.5. Turn in all meals unfit for consumption to the first in-flight kitchen. If in radio contact with the issuing station, relay aircraft tail number, mission identifier, number of spoiled meals (by menu), issuing organization, and in the case of frozen meals, the manufacturing agency, and manufacturer's lot number.

13.5.4.6. When prepared meals have not been furnished to passengers, the loadmaster will annotate the individual's boarding pass to reflect reimbursement is authorized. Inform passengers they may receive refunds at the next station or the originating or destination terminal.

13.6. Over-Packed Meal Procedures: Not Used.

13.7. En Route and Post Flight Duties.

13.7.1. At stations where a crew change is made and loading or offloading is required, the inbound loadmaster is responsible for offloading the aircraft. The outbound loadmaster is responsible for planning and loading the outbound load.

13.7.2. At crew stage points, brief relief personnel about passenger and aircraft equipment, any missing items, the location of through cargo, mail and baggage, and any information pertinent to through passengers. Point out cargo requiring special consideration (hazardous material, perishables, etc.).

13.7.3. Assist passengers to deplane. If BLUE BARKS, DVs, COIN ASSIST, or couriers are aboard, the loadmaster will inform the protocol or traffic representative respectively.

13.8. Loaded Weapons. Weapons are considered loaded if a magazine or clip is installed in the weapon. This applies even though the clip or magazine is empty.

13.8.1. Personnel who will engage an enemy force immediately on arrival (actual combat) may carry basic combat loads on their person. Weapons will remain clear with magazines or clips removed until immediately prior to exiting the aircraft. The troop commander will coordinate with the loadmaster prior to directing personnel to load any weapons. This applies to airborne assaults and airland missions.

13.8.2. Personnel who will not immediately engage an enemy force will store basic ammunition loads in a centralized location for redistribution on arrival at the objective. Magazines or clips will not be inserted into weapons.

13.9. Weight and Balance. Accomplish weight and balance for this airplane according to T.O. 1-1B-50, *Weight and Balance*, TO 1C-130X-5, *Basic Weight Check List and Loading Data*, and AFI 11-2C-130V3, Addenda A. The unit possessing the airplane maintains the primary weight and balance handbook containing the current airplane status and provides a supplemental weight and balance handbook for each airplane. Enclose the supplemental handbook in a wear-resistant binder (preferably metal), stenciled "Weight and Balance" with the airplane model and complete serial number on the cover or spine.

13.9.1. The supplemental handbook will include TO 1C-130X-5, AFI 11-2C-130V3 Addenda A, sufficient copies of DD Form 365-4 to complete the mission and a certified copy of the current DD Form 365-3, **Chart C-Basic Weight and Balance Record**. Chart C will include the airplane's basic weight, basic moment, and center of gravity.

13.9.2. The weight and balance section of the unit possessing the airplane will maintain the required documents.

13.9.3. Obtain the total fuel weight from the flight engineer or read directly from each gauge and compute the sum for total fuel weight. Do not rely on the fuel totalizer gauge.

13.9.4. Loadmasters, in units who authorize the use of Canned Forms F, will still compute and provide the flight engineer with an accurate operating weight.

13.9.5. The loadmaster will turn in the original DD Form 365-4 to be filed at the departure airfield and maintain a physical or electronic copy for the duration of the flight.

13.10. Cargo Validation On-loading and Off-loading Procedures and Format. To assist in the cargo validation process, a cargo validation on-loading and off-loading format is provided in this chapter. After completion, send through standardization channels to MAJCOM A3V. MAJCOM A3V will forward these comments to HQ AMC/A3V. Use the following format when tasked to validate a new loading procedure or when encountering any cargo you feel requires special or specific on-loading, off-loading or tiedown procedures not currently listed in T.O. 1C-130A-9.

13.10.1. General Loading Data:

13.10.1.1. Nomenclature of Item. Give military or civilian name, national stock number (NSN), and a brief description of the item, i.e., dump truck, medical van, etc.

13.10.1.2. Dimensions (in inches). Length, width, and height. Rough drawing or picture of the unit, pointing out critical dimensions, projections, overhangs, etc.

13.10.1.3. Weight (in pounds). Gross weight; individual axle weight; or data plate weight if possible.

13.10.1.4. Number of loading crew personnel and loadmasters required to on-load or off-load cargo and their position to observe clearances, if required.

13.10.1.5. Equipment and Material Requirements. Special equipment and material required to on-load and off-load cargo, i.e., cargo winch, prime mover, shoring requirements.

13.10.1.6. Aircraft Configuration Required.

13.10.1.7. Preparation of Cargo for Loading. Components that must be removed or reconfigured to on-load and off-load cargo, i.e., helicopter struts, exhaust stacks, cabs, etc.

13.10.1.8. Loading Procedures.

13.10.1.9. Location of Tiedown Points.

13.10.1.10. Offloading Procedures.

13.10.1.11. Comments.

13.11. Emergency Airlift of Personnel. Follow procedures IAW paragraph 17.7.

13.12. Rucksacks. Not Used.

13.13. Flight Station and Troop Compartment. Not Used.

13.14. Cargo and MHE Issues. Not Used.

13.15. Body Fluid/Bio-Hazard Clean-Up. When aircraft are dispatched to transport enemy prisoners, wounded/medically ill personnel or human remains, the interior of the aircraft can become contaminated with different types of bodily fluids during these operations. Because of the potential health risk to passengers and crew, aircrew will immediately clean-up, to the best of their ability, all body fluids/waste when it does not detract from their primary duties. Crews will request troop commanders, team leaders, or traveling companions assist with the in-flight clean-up whenever possible.

NOTE: At no time will aircrew attempt to clean-up without proper safety equipment. If available, clean up of bodily fluid/bio-hazard waste may be accomplished with clean-up kits, NSN 6515-01-524-9755. AMC aerial ports/fleet service functions will order and maintain kits to stock each AMC mission. For units at non-AMC aerial port/fleet service locations, kits can be ordered through medical supply channels. If kits are unavailable, safety equipment in the aircraft Protective Clothing Kit (PCK) may be used.

13.15.1. When it is not possible for aircrew or passengers to clean-up during flight or immediately upon landing, fleet service personnel will clean any residual fluids/waste on the surface areas of cargo and passenger compartments.

13.15.2. In cases where fluids/wastes have gone beyond the surface of the cargo/PAX compartment and into the floors, walls, flight deck, etc, maintenance personnel will be notified and an entry in the AFTO Forms 781A will be made.

13.15.3. When possible cordon off the contaminated area to keep unauthorized personnel away from tracking fluids throughout the aircraft. Apply paper towels or other absorbent material to absorb the fluids and minimize the spill area. Clean the contaminated area thoroughly, double bag materials and turn over to the bioenvironmental department for proper disposal. Units will establish local policy with the infection control officer for disposal procedures.

Chapter 14

FUEL PLANNING

14.1. General. This chapter provides general C-130 fuel planning considerations, definitions, guidance and procedures. Publish local procedures in unit supplements to this AFI.

14.1.1. Category I Reserve. 10% of the flight time fuel over the Category I route/route segment, not to exceed 1+00 fuel at normal cruise. This is designated on the ACFP by the plus symbol (+) or ampersand symbol (&).

14.1.2. Contingency Fuel: Extra fuel indentified to compensate for unforeseen circumstances during any phase of flight (i.e. Unforecasted weather, launch delay, etc).

14.1.3. Depressurization Fuel: Pressurization loss is now known as depressurization fuel. The additional fuel required in the event of a cabin depressurization followed by an extended diversion to an alternate at low altitude where fuel consumption is increased.

14.1.4. Required Ramp Fuel Load (RRFL): Minimum fuel required at engine start to complete the mission.

14.1.5. Wing Relieving Fuel (WRF): WRF is used to maintain primary fuel management which is essential for the long term structural integrity of the C-130. It is additional fuel kept in the main tanks intended to counter wing bending moments. These wing bending moments are most pronounced with heavy cargo loads and lighter fuel weights. WRF is calculated using the appropriate TO 1C-130xx-1 Weight Limitations Charts

14.1.6. All local and JA/ATT missions flying low-level will initially takeoff with main tanks full and maintain primary fuel management to reduce the effects of wing upbending and increase the center wingbox service life. The following two exceptions apply to taking off with less than full main tanks:

14.1.6.1. Secondary fuel management with fuel in the AUX tanks for heavy-weight assault training.

14.1.6.2. Secondary fuel management with fuel in the AUX tanks for 'elevator lifts' out of a dirt assault LZ/DZ.

14.2. Fuel Conservation.

14.2.1. Conservation of fuel requires everyone's active participation. Planning guidelines for fuel conservation:

14.2.1. **(934AW)** Fuel conservation is an AMC/AFRC high emphasis item that requires everyone’s active participation.

14.2.1.1. Use optimized CFPs when possible.

14.2.1.2. Long range cruise (LRC) and/or optimum altitude step-climb profile should be flown.

14.2.1.3. Minimize the use of the APU/GTC when practical.

14.2.1.4. Delay engine start.

14.2.1.5. Cruise CG should be aft if practical.

14.2.1.6. Fly enroute descents when possible.

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.

14.2.2.4. For Wing Relieving Fuel (WRF) ***NOTE:*** WRF is additional fuel kept in the main tanks intended to counter wing bending moments. These wing bending moments are most pronounced with heavy cargo loads and lighter fuel weights. WRF is an element of primary fuel management essential for the long term structural integrity of the C-130. WRF is considered unusable fuel until the cargo is off-loaded (except in an emergency). In practical terms, it is the minimum *landing* fuel for a particular load in a specific aircraft. It is calculated using the appropriate T.O. 1C-130xx-1 Section V Weight Limitations Chart.

14.2.3. Planning guidelines for fuel conservation:

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. **(Added-934AW)** 934 AW has established standard fuel loads for local tactical training missions dropping actual loads of 28,000 lbs and a standard fuel load of 26,000 lbs for all other local training missions except 4.0 hour proficiency sorties, which will be fueled to 32,000 lbs. Aircraft will be refueled between sorties to facilitate the conservation of fuel and reducing wear and tear on the center wing box. For missions tasked by/supporting AMC, refer to prevailing HHQ fuel planning guidance.

14.3. Fuel Planning. Navigators are allowed to fuel plan by either using the appropriate TO 1C-130XX1-1 method (see Table 14.1.) or electronically by using Combat Flight Planning Software (CFPS). In addition, Advanced Computer Flight Planning (ACFP) fuel plans provided by 618 TACC are authorized for determining required fuel loads.

14.3.1. **General**

14.3.1.1. Weight. Add OPERATING WT, CARGO/PAX WT, and RAMP FUEL to obtain RAMP WT. Subtract TAXI fuel (item 9 on the AF Forms 4116) 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 difference is TEMP DEV.

14.3.1.3. Local supplements will not dictate "IAF" or "Top of descent fuel."

14.3.1.4. Plan a 45-minute fuel reserve at destination or alternate (when an alternate is required).

14.3.1.4.1. For remote destinations, holding is authorized in lieu of an alternate airport. In such situations, use 2+00 hrs reserve fuel (1+15 holding in lieu of an alternate and 0+45 reserve).

14.3.1.5. For all missions other than local training missions, calculate 30 minutes of contingency fuel, using destination gross weights. Local training missions are not required to carry contingency fuel. If contingency fuel is carried on local training missions, it should not exceed 30 minutes. Contingency fuel is not considered reserve fuel since it can be consumed at any point during the mission.

14.3.1.6. Reserve and contingency fuel will be computed using consumption rates providing maximum endurance at 10,000 feet MSL using the end of cruise gross weight (ECGW). If an alternate is required, compute using gross weight at alternate destination.

14.3.1.6.1. For remote destinations, reserve and contingency fuel will be computed using consumption rates providing maximum endurance at 20,000 feet MSL using ECGW.

14.3.2. **Alternate Selection.**

14.3.2.1. Plan fuel to an alternate only when AFI 11-202V3 and Chapter 6 of this instruction require the use of an alternate.

14.3.2.2. When only one alternate is required, use the closest suitable and airfield meeting AFI 11-202V3 weather criteria mission requirements (such as special requirements for HAZMAT or patients).

14.3.2.3. If two alternates are required, fuel plan to the more distant of the two meeting AFI 11-202V3 weather criteria.

14.3.2.4. The practice of selecting an alternate in another weather system or selecting an alternate based on maintenance capability will no longer be used.

14.3.2.5. When filing an alternate located in Alaska or at latitudes greater than 59 degrees (North or South) do not add additional holding fuel.

14.3.3. **Depressurization Fuel.** During all flight portions crews are to consider the possibility of exercising depressurization procedures**.**

14.3.3.1. Crews are to calculate the fuel required to reach a recovery airfield in the event of depressurization at the ETP. Additional fuel for pressure loss at ETP is 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 a suitable airfield.

14.3.3.2. Prior to flight, crews must compare the calculated depressurization fuel with the RRFL to determine if additional fuel is required. See Table 14.2.

14.3.4. **Required Ramp Fuel load (RRFL)**

14.3.4.1. Aircraft commanders and navigators will determine the RRFL using all available planning tools including ACFP (if available). When actual fuel load exceeds the RRFL by more than 2,200lbs, defuel the aircraft to the RRFL.

14.3.4.1.1. When there is a conflict between an on-time departure and defueling, the 618 TACC deputy director of operations (DDO) or MAJCOM C2 equivalent will determine which takes precedence. The OG/CC (or designated representative) will make this determination when serving as execution authority for the mission.

14.3.4.2. Tankering fuel for convenience is prohibited. MAJCOM C2 or 618 TACC sanctioned tankered fuel is deemed operationally necessary, and will be included in the RRFL.

14.3.4.3. For those missions that are flight managed by the 618 TACC, when an aircraft commander believes the fuel load is insufficient to execute the mission:

14.3.4.3.1. They will call the appropriate FM to identify and resolve differences.

14.3.4.3.2. If the aircraft commander and FM do not reach agreement, the aircraft commander is the final authority on the safe conduct of the mission.

14.4. TO 1C-130xx1-1 Fuel Planning.

14.4.1. Use the appropriate TO 1C-130xx1-1 as listed in **Table 14.1** for fuel planning. Use 95 percent engine charts and Section II of the "Interim 4116" to compute RRFL. The "Interim 4116" is located on the A3VX website at **https://private.amc.af.mil/a3/a3v/publications.aspx** under "C-130 Publications". All other items of the fuel analysis portion of AF IMT 4116 are explained in **Table 14.2**

Note: The interim 4116 provides a temporary fix by updating several blocks of the fuel plan in Section II until a new AF Form is published.

14.4.2. En route fuel calculation. All times are calculated in minutes and all performance data computed using 95% engines.

14.4.2.1. There are three distinct phases of flight for which required fuel quantities and or fuel flows must be calculated. These three phases are: initial climb out, start cruise and end cruise. Procedures for the necessary calculations are as follows:

14.4.2.1.1. Prior to any calculations, use the appropriate TO 1C-130xx-1-1 Part 4 Figures to extract Time to Climb (TTC), Distance to Climb (DTC), and Fuel to Climb (FTC). Apply the correct temperature deviation and correct for pressure altitude to compute all climb data.

14.4.2.1.1.1. Using TTC and DTC, calculate climb TAS.

14.4.2.2. Climb Fuel. In the climb section of the en route fuel computation worksheet enter takeoff gross weight (TOGW), TTC, and FTC in the appropriate blocks.

14.4.2.3. Start Cruise.

14.4.2.3.1. Subtract climb fuel from the TOGW to obtain the start cruise gross weight.

14.4.2.3.2. Enter the total flight time from the flight plan in the total time block. Subtract TTC from the total time to obtain cruise zone time.

14.4.2.3.3. Enter the appropriate TO 1C-130xx-1-1 Part 5 figure to extract fuel flow. Entering arguments are start cruise gross weight, pressure altitude and temperature deviation. Fuel flow extracted is per engine. Multiply the extracted fuel flow by four to arrive at fuel flow total.

14.4.2.3.4. Divide the fuel flow total by 60 and multiply by the zone time to obtain start cruise zone fuel.

14.4.2.4. End Cruise.

14.4.2.4.1. Subtract cruise zone fuel from the start cruise gross weight to obtain end cruise gross weight.

14.4.2.4.2. Enter the appropriate TO 1C-130xx-1-1 Part 5 figure to extract fuel flow. Entering arguments are end cruise gross weight, pressure altitude and temperature deviation. Fuel flow extracted is per engine. Multiply the extracted fuel flow by four to arrive at fuel flow total. This is also the terminal fuel flow (TFF).

14.4.2.5. Average Cruise Fuel Flow.

14.4.2.5.1. Average the start cruise and end cruise fuel flow to obtain the average cruise fuel flow.

14.4.2.5.2. Divide the fuel flow total by 60 and multiply by the cruise zone time to obtain cruise zone fuel total.

14.4.2.6. Total en route fuel. Add the FTC to the cruise zone fuel total to determine total en route fuel.

14.4.3. Compute preflight endurance using the Average Cruise Fuel Flow. When computing preflight endurance, always subtract 1,300 pounds from actual ramp fuel to account for start, taxi and takeoff.

14.4.4. When computing fuel using TO 1C-130X-1-1, use the appropriate drag index. Standardized drag indexes may be established by local OGVs and published in local supplements**.**

14.4.4. **(934AW)** Standard drag index for all 934 AW aircraft is **+15** IAW T.O. 1C-130H-1-1 chapter 1. Crews are reminded to confirm aircraft configuration before departure from MSP as aircraft configuration is subject to theater specific SPINS and might differ from home station standard configuration.

14.4.5. For an explanation of how to compute maximum endurance fuel flow (MEFF) using the applicable TO 1C-130XX1-1 reference the "Maximum Endurance Fuel Flow How To Guide" at **https://private.amc.af.mil/a3/a3v/publications.aspx** under "C-130 Publications"

14.5. CFPS Fuel Planning. For instructions on how to fuel plan using CFPS reference the "CFPS Planning Guide" at **https://private.amc.af.mil/a3/a3v/publications.aspx** under "C-130 Publications". Also, a modified electronic version of the AF Form 4116 (CFPS 4116) can be downloaded from the same website for use with CFPS fuel planning.

14.5.1. DELETED

14.5.2. DELETED

14.5.3. DELETED

14.5.3.1. DELETED

Table 14.1. Fuel Planning Publications.

AIRCRAFT MODEL	PUBLICATIONS
C-130E	TO 1C-130E(H)-1-1
C-130H	TO 1C-130H-1-1

Table 14.2. Fuel Load Components.

ENROUTE		Fuel for flight time from departure to overhead destination or initial penetration fix at cruise altitude (including time for planned orbit, escort, search, recovery, appropriate climb, weather recon, etc. when applicable).
CAT I FUEL RESERVE		10% of the flight time fuel over the Category I route/route segment, not to exceed 60 minutes fuel at normal cruise. For orbit/search missions, 10% of flight time for that portion with inadequate NAVAIDS from the orbit/search point to destination. Compute at average fuel flow (-1-1) or normal cruise fuel flow (CFPS).
RESERVE		45 minutes (2+00 hrs for remote destinations). Reserve fuel will be computed using consumption rates providing maximum endurance fuel flow at 10,000 MSL (20,000 MSL for remote destinations). For gross weight, use end cruise gross weight (ECGW) from section II of the AF Form 4116. This reserve fuel replaces holding fuel.
CONTINGENCY		30 minutes. Use same fuel flow as reserve fuel above. (Not required for local training missions)
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.
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. This accounts for gauge error. Do not include this 4,000lbs of fuel in the reserve and contingency fuel calculations.
IDENTIFIED EXTRA	DEPRESSURIZATION FUEL	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 a suitable airfield. If computed fuel required for depressurization is less than or equal the total of blocks 2, 3, 5, and 12, no additional entry required in block 7. If computed fuel exceeds the sum of blocks 2, 3, 5, and 12, add the difference in block 7.
	STORED FUEL	Ramp fuel for succeeding legs without refueling.
	THUNDERSTORM AVOIDANCE	1,500 lbs if forecast thunderstorms are scattered or numerous along the route of flight. Will be based on the DD Form 175-1 or equivalent.
	ICING	1,000 lbs if route of flight has known icing conditions. Will be based on the DD Form 175-1 or equivalent.
	KNOWN HOLDING DELAYS	Fuel for anticipated/planned excess holding time. Compute at terminal fuel flow.

	WING RELIEVING FUEL (WRF)	Dependent on cargo weight and basic aircraft operating weight. Normally negligible below cargo weights of 35,000 lbs. Calculate required WRF using the Weight Limitations Charts in appropriate TO 1C-130X-1. Minimum landing fuel of 4,000 lbs is included as part of the WRF total.
	TAXI AND TAKEOFF	1,300 lbs. Entry always required.
	UNIDENTIFIED EXTRA	Difference between required ramp and actual ramp fuel. When actual fuel load exceeds the RRFL by more than 2,200lbs, defuel the aircraft to the RRFL. See exceptions in para 14.1.6.1. and 14.1.6.2.
	MINIMUM DIVERSION	Total of ALTERNATE/MISSED APPROACH, RESERVE, WRF and APPROACH/LANDING.

Figure 14.1. C-130 Fuel Plan (-1 -1) Example.

II. FUEL/ETP PLANNING

NAV:	Lt Bag O'Donuts	OPERATING WT: 86.0	
AC:	Capt Hans O'Brick	CARGO/PAX WT: 10.0	
TAIL #:	64-0527	RAMP FUEL: 57.0	
DATE:	1-Nov-09	RAMP WT: 155.0	
CALLSIGN:	REACH 4527	TAKEOFF WT: 153.7	
		TIME	FUEL
1. ENROUTE		8+32	39.6
2. CAT 1 RESERVE (AVG FF)		+45	3.5
Max End FF: 3280 3. RESERVE (MEFF)		+45	2.5
4. CONTINGENCY (MEFF)		+30	1.6
ALTERNATE + 5. MISSED APPROACH		+31	2.2
APPROACH/ 6. LANDING	1.0/4.0		5.0
IDENTIFIED 7. EXTRA			0.0
TOTAL (1 thru 7) 8. TAKEOFF			54.4
9. TAXI	1.3		1.3
10. REQUIRED RAMP			55.7
11. ACTUAL RAMP		ENDURANCE 12+46	57.0
UNIDENTIFIED 12. EXTRA			1.3
MIN DIV OR (3+5+6+ WRF) 13. REQ OVHD DEST			9.7

1. Note: Wing Relieving Fuel (WRF), when required, is calculated as identified extra fuel; however, it must be included as required overhead fuel in Block 13.

2. Note: The 4000 LB landing fuel should be included as part of any required WRF.

3. Use "END CRUISE" gross weight for computing CONTINGENCY AND RESERVE fuels.

NAVIGATOR SIGNATURE

Joseph Bag O'Donate

CLIMB TEMP DEV:	+5	CRUISE TAS 270	CRUISE CEILING 17.0
CRUISE TEMP DEV:	+5		
DISTANCE TO CLIMB: (DTC)	97 NM	TIME TO CLIMB (TTC) +37	CLIMB TAS 195

ENROUTE FUEL COMPUTATION WORKSHEET

ZONE	GROSS WEIGHT	ALT	ZONE TIME	TOTAL TIME	F/F PER ENGINE	F/F TOTAL
A. CLIMB	153.7	↗	IN MINS	+30		
TTL CLIMB FUEL -	2.5					
B. START CRUISE	151.2	17.0	482	512	1230	4920
CRUISE ZONE FUEL -	39.5			D. AVG CRUISE FUEL FLOW		4620
C. END CRUISE	111.7	17.0			1080	(TFF) 4320

ETP CALCULATION

LSAF	MDPT		FSAF
KCHS	N 38-17 W 053-00		LPLA
DIST: 1360	TIME: 4+36	DIST: 2597	TIME: 8+32
91	30	1360	4+36
1269	4+06	1237	3+56
GS: 310	WF1: +40	GS: 315	WF2: +45

$$\frac{\text{DIST (LSAF TO FSAF) (2597)}}{\text{(WF2 - WF1) + 2 (TAS) (545)}} = \frac{\text{T (286) MIN}}{60}$$

TOTAL TIME TO FSAF - T = TIME TO ETP

8+32 - 4+46 = 3+46

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

ENROUTE FUEL FORMULA

$$\frac{\text{CLIMB DISTANCE}}{\text{CLIMB TIME}} = \frac{\text{CLIMB TAS}}{60}$$

$$\frac{\text{FUEL FLOW TOTAL (FFT)}}{60} \times \text{ZONE TIME (MINS)} \quad \text{ZONE FUEL}$$

$$\frac{\text{START CRUISE FF + END CRUISE FF}}{2} = \text{AVG CRUISE FF}$$

$$\text{FUEL FLOW PER ENGINE} \times 4 = \text{FUEL FLOW TOTAL (FFT)}$$

1. EXTRACT DTC, TTC, CL
AND CRUISE CEILING FR
2. CLIMB. ENTER T.O. GR
AND FTC
3. START CRUISE. IN GRO
SUBTRACT CLIMB FUEL F
DETERMINE START CRUI
4. ENTER TOTAL TIME FR
SUBTRACT CLIMB TIME F
DETERMINE CRUISE TIM
5. OBTAIN FUEL FLOW PE
-1-1 RANGE SUMMARY C
6. COMPUTE FUEL FLOW
BY ZONE TIME TO ARRIV
7. END CRUISE. SUBTRAC
FUEL FROM START CRUI
8. ENTER RANGE SUMMA
END CRUISE WT TO OBT
MULTIPLY BY 4 FOR TOT
THIS IS ALSO TFF
9. AVG CRUISE FF. AVG S
END CRUISE FF TO GET A
10. AVG CRUISE FUEL + C

Figure 14.2. C-130 Fuel Plan (CFPS) Example.

II. FUEL/ETP PLANNING		
NAV:	OPERATING WT:	86.5
AC:	CARGO/PAX WT:	10.0
TAIL #:	RAMP FUEL:	54.0
DATE:	RAMP WT:	150.5
CALLSIGN:	TAKEOFF WT:	149.2
	TIME	FUEL
1. ENROUTE	6+40	35.8
2. CAT 1 RESERVE (NCFF)	+40	3.5
3. RESERVE (MEFF)	+45	2.8
4. CONTINGENCY (MEFF)	+30	1.9
ALTERNATE + 5. MISSED APPROACH	+20	1.7
APPROACH/ 6. LANDING (1.0/4.0)		5.0
IDENTIFIED 7. EXTRA	T-STORMS	1.5
TOTAL TAKEOFF 8. (1 thru 7)		52.2
9. TAXI		1.3
10. REQUIRED RAMP		53.5
Ramp Fuel (-) Taxi → 11. ACTUAL RAMP	ENDURANCE 9+54	54.0
UNIDENTIFIED 12. EXTRA		0.5
MIN DIV OR (3+5+6+ WRF) 13. REQ OVHD DEST		9.5

NAVIGATOR SIGNATURE

CLIMB TEMP DEV:	-8	CRUISE TAS	CRUISE CEILING
CRUISE TEMP DEV:	-10	300	FL210 (22,193)

ENROUTE FUEL COMPUTATION WORKSHEET

ENROUTE FUEL		GROSS
TOTAL FUEL (1st LEG OF CFPS)	52,700	TOGW
TOTAL FUEL (LAST LEG OF CFPS) -	16,900	ENROUTE FUEL -
ENROUTE FUEL (BLOCK 1) =	35,800	ECGW =

FUEL FLOWS	LB/HR (4 ENGINE)
NORMAL CRUISE FUEL FLOW *(NCFF = CFPS FF on MDPT leg)*	5,304
TERMINAL FUEL FLOW *(TFF = CFPS FF for last leg of FLT plan)*	5,113
MAX END FUEL FLOW (MEFF = Calculated using WinFPM)	3,740

ETP CALCULATION

LSAF CYYT		MDPT N51-00		W025-00		FSAF EGUN	
DIST	1121	TIME	3+32	DIST	2116	TIME	6+40
-	75	-	+23	-	1121	-	3+32
=	1046	=	3+09	=	995	=	3+08
GS	332	WF1	+32	GS	318	WF2	+18

DIST (LSAF TO FSAF) (2116) T(217)MIN
(WF2-WF1) + 2(TAS) (586) = ^60
TOTAL TIME TO FSAF - T = TIME TO ETP
6+40 (-) 3+37 = 3+03
ETP METHOD 1 2 3 4 (CIRCLE ONE)

FO

Endurance =

Fuel Burned =

IDENTI

Thunderstorm Avoidance:

Icing: 1,000 lbs

Depressurization: 1,000 lb
suitable airfield. Add 30 mi
to this number. If compute
or equal to blocks 2, 3, 5, a

NOTES

1. Wing Relieving Fuel (WRF), when required, must be included as required overhead fuel in Bloc
2. The 4000 lb landing fuel should be included as part of any WRF, Reserve or Contingency fuels.
3. When planning for holding fuel in lieu of an alternate for remote destinations, use 2+00 reserv holding/+45 reserve)
4. Use End Cruise Gross Weight (ECGW) when computing Reserve and Contingency fuels.
5. Reserve/Contingency fuel (always required): computed using MEFF at 10,000 ft/MEFF at 20,0
6. Missed Approach: 2,200 lbs. Required if destination is below ceiling minimums but above visib planned destination approach.
7. Depressurization Fuel: Additional Fuel for pressure loss at ETP - used when pressurized, carryi aircraft oxygen is not available to the passengers.

Figure 14.3. Multi-Leg Fuel Plan (CFPS) Example.

III. Multi- Leg Fuel Planning						
	Dept	Dest	Dept	Dest	Dept	Dest
NAV:	OPERATING WT:	86.5	OPERATING WT:	86.5	OPERATING WT:	86.5
AC:	CARGO/PAX WT:	10.0	CARGO/PAX WT:	15.0	CARGO/PAX WT:	10.0
TAIL #:	RAMP FUEL:	40.0	RAMP FUEL:	30.0	RAMP FUEL:	18.0
DATE:	RAMP WT:	136.5	RAMP WT:	131.5	RAMP WT:	114.5
CALLSIGN:	TAKEOFF WT:	135.2	TAKEOFF WT:	130.2	TAKEOFF WT:	113.2
NAVIGATOR SIGNATURE	1		2		3	
	TIME	FUEL	TIME	FUEL	TIME	FUEL
1. ENROUTE	1+35	7.7	2+02	9.7	1+24	6.6
2. CAT 1 RESERVE (NCFF)	0	0	0	0	0	0
3. RESERVE (MEFF)					45	2.7
4. CONTINGENCY (MEFF)					30	1.8
ALTERNATE +					0	0
5. MISSED APPROACH						0
6. APPROACH/ LANDING		1.0		1.0		5.0
7. IDENTIFIED EXTRA: (FUEL FOR NEXT LEG)		29.5		17.5		0
8. TOTAL TAKEOFF (1 thru 7)		38.2		28.2		16.2
9. TAXI, AND TAKEOFF		1.3		1.3		1.3
10. REQUIRED RAMP		39.5		29.5		17.5
11. ACTUAL RAMP		40.0		30.0		18.0
12. UNIDENTIFIED EXTRA		0.6		0.6		0.6
13. MIN DIV OR (3+5+6+ WRF) REQ OVHD DEST						7.7

1. Note: Wing Relieving Fuel (WRF), when requireed, is calculated as identified extra fuel; however, it must be included as required overhead fuel in Block 13.
2. Note: The 4000 LB landing fuel should be included as part of any required WRF
3. Use "END CRUISE GROSS WEIGHT (ECGW)" for computing RESERVE and CONTINGENCY fuels.

LEG 1			
ENROUTE FUEL		G	
TOTAL FUEL (1st LEG OF CFPS)	38,700	TOGW	
TOTAL FUEL (LAST LEG OF CFPS) (-)	31,000	ENROUTE FUEL	
ENROUTE FUEL (BLOCK 1) =	7,700	ECGW =	
FUEL FLOWS	LB/HR (4 ENGINE)	CLIMB TEMP DEV	-2
NORMAL CRUISE FUEL FLOW (NCFF = CFPS FF on MDPT leg)	4,920	CRUISE TAS	300
TERMINAL FUEL FLOW (TFF = CFPS FF for last leg of FLT plan)	4,423	DRAG INDEX	+15
MAX END FUEL FLOW (MEFF = Calculated using WinFPM)	3,812	ENDUR	
LEG 2			
TOTAL FUEL (1st LEG OF CFPS)	28,700	TOGW	
TOTAL FUEL (LAST LEG OF CFPS) (-)	19,000	ENROUTE FUEL	
ENROUTE FUEL (BLOCK 1) =	9,700	ECGW =	
FUEL FLOWS	LB/HR (4 ENGINE)	CLIMB TEMP DEV	-8
NORMAL CRUISE FUEL FLOW (NCFF = CFPS FF on MDPT leg)	4,810	CRUISE TAS	300
TERMINAL FUEL FLOW (TFF = CFPS FF for last leg of FLT plan)	4,385	DRAG INDEX	+15
MAX END FUEL FLOW (MEFF = Calculated using WinFPM)	3,725	ENDUR	
LEG 3			
TOTAL FUEL (1st LEG OF CFPS)	16,700	TOGW	
TOTAL FUEL (LAST LEG OF CFPS) (-)	10,100	ENROUTE FUEL	
ENROUTE FUEL (BLOCK 1) =	6,600	ECGW =	
FUEL FLOWS	LB/HR (4 ENGINE)	CLIMB TEMP DEV	-5
NORMAL CRUISE FUEL FLOW (NCFF = CFPS FF on MDPT leg)	4,685	CRUISE TAS	300
TERMINAL FUEL FLOW (TFF = CFPS FF for last leg of FLT plan)	4,320	DRAG INDEX	+15
MAX END FUEL FLOW (MEFF = Calculated using WinFPM)	3,640	ENDUR	

14.6. ACFP Fuel Planning.

14.6.1. ACFP flight/fuel plans are available to aircrew flying 618 TACC flight managed missions.

14.6.2. ACFP fuel plans will designate reserve and contingency fuels under the holding fuel block. ACFP will have 1+15 holding when combining 0+45 reserve and 0+30 contingency fuel (for remote destinations ACFP will calculate 2+30 holding, combining 2+00 reserve and 30 minutes contingency fuel).

14.7. Multi-Leg Fuel Planning. See **Figures 14.2 and 14.4** A multi-leg fuel plan becomes necessary when a mission includes multiple stops where fuel is unavailable. Use the following procedure for multi-leg fuel planning, assume a three leg mission with legs labeled 1, 2, and 3:

14.7.1. Begin with the last leg (3) and fuel plan as normal to obtain required ramp fuel.

14.7.2. Next, determine the fuel required for leg 2. Include the required ramp fuel from leg 3 as identified extra fuel for leg 2. Do not plan for contingency, reserve or alternate/missed approach fuel for leg 2 unless those totals exceed the required ramp fuel for leg 3. If this occurs, add the difference in the identified extra block for leg 2. Use 1,000 lbs. for approach and landing.

14.7.3. Plan leg 1 using the same procedures you used for leg 2.

NOTES:

1. Fuel requirements must be verified at each stopover airfield. Requirement must be recomputed whenever the planned burnoff changes; for example, en route altitude changes, actual cargo/passenger load differs from the estimate, holding is accomplished, diversion to alternate is required, etc.

2. Regardless of the number of mission segments involved, fuel planning is always accomplished by planning the last leg's requirements first. The remaining leg requirements are planned in the reverse order to be flown until the refueling airfield is reached.

Chapter 15

INTENTIONALLY LEFT BLANK

15.1. This chapter is not used for C-130 operations.

Chapter 16

COMBAT MISSION PLANNING

16.1. General. This chapter provides guidance for general C-130 tactical operations. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.25. Mission planning is normally conducted the day prior to the mission. Operations group commanders may elect to use a "same day mission plan" option. The aircrew is ultimately responsible for the accuracy of the mission materials. Unit mission planning facilities should possess essential mission planning material.

16.1.1. NVG Mission Planning. One full day of planning should be allocated to missions that will operate in the NVG low-level environment. This planning may be accomplished by the pilot, navigator, or appropriate representative designated by the mission commander for formation flights.

16.2. DZ Restrictions.

16.2.1. Planners will attempt to ensure that the DZ is long enough to avoid multiple passes in a hostile environment. If multiple passes become necessary, they may be accomplished by planning a racetrack/re-attack or an abbreviated route. In any case, multiple passes will not be performed unless they have been coordinated with the user, they have been planned and briefed, and they have been annotated on navigational charts (including the racetrack/re-attack flight path).

16.2.2. Locate subsequent Multiple Points of Impact (MPIs) a minimum of 500 yards from the previous Point of Impact (PI). If MPIs are placed laterally, increase the width of the DZ accordingly. Ensure the PI distance from leading edge complies with AFI 13-217. Compute minimum size DZ required for the most restrictive aircraft in each element relative to their PI to ensure it fits within the surveyed DZ boundaries. Limit the number of MPIs to three without MAJCOM approval. All aircraft within an element must drop on the same PI. The coordinates for each PI must be provided to the aircrews. Use the most accurate PI altitude available. Thoroughly deconflict and brief all salvo and escape procedures as well as DZ markings prior to mission execution. Only the first PI will be marked. The user accepts responsibility when employing MPI for all injury/damage to personnel/equipment.

16.2.3. Use of unmarked DZs requires OG/CC approval for unilateral missions, and MAJCOM/A3/DO approval for all other peacetime training missions. Authorization to use unmarked DZs for contingency airdrops will be contained in SPINs or ATO.

16.3. Route Planning.

16.3.1. Low-Level Altitude Restrictions. The following minimum altitudes are established for C-130 airlift operations. Higher altitudes may be dictated by FLIP/ICAO procedures, training considerations, terrain, or operational directives. ***WARNING:*** Aeronautical charts do not depict man-made obstacles less than 200 feet AGL or a change in terrain until it exceeds the chart contour interval. The worst situation would occur if a 199-foot tower sat on terrain with an elevation just below the next higher contour. For a TPC (1:500,000) with a contour interval of 500 feet, this results in an uncharted obstacle existing 698 feet above charted terrain. Additionally, the highest spot elevation on any given leg may not be the

highest terrain as in the case of gradually rising elevations. Planners must ensure accurate terrain analysis be evaluating both spot elevations and the highest contour level. ***CAUTION:*** Some charts may depict terrain and obstacle altitudes in meters versus feet (e.g., JOG and TLM charts in some areas of the world).

16.3.1.1. Day VMC En-Route. Fly no lower than 300 feet AGL modified contour altitude above the terrain using visual references and radar altimeter.

16.3.1.2. Night VMC En Route (Non-NVGs). Fly no lower than an indicated altitude of 500-feet above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation), or 400-feet plus one chart contour interval above the highest depicted terrain contour, whichever is highest, within 5 NMs of route centerline to include the aircraft turn radius over each turnpoint. If the altitude for the next leg is higher than the current leg altitude, climb will be completed prior to the turnpoint. If the altitude for the next leg is lower than the current leg, do not initiate descent until over the turnpoint. Legs may be divided into segments for night altitude computations, depending on terrain differential or threats in order to allow flight closer to the ground. Once the obstacle or terrain feature is visually identified and the aircraft is confirmed well clear, the crew may descend to the next segmented altitude, if lower.

16.3.1.3. NVG En Route. Fly no lower than indicated altitude of 500 feet above the highest spot terrain elevation, or 400 feet plus one chart contour interval above the highest depicted terrain contour, whichever is higher, within 3 NM on centerline. During mission planning, aircrews must identify a start climb point appropriate for the location and height of the "man-made" obstacles within 3 NM of planned course centerline. If the aircrew does not visually identify the charted "man-made" obstacles within 3 NM of planned course centerline by the planned start climb point, the crew will climb to attain an altitude of 500 feet above the obstacle. If the altitude for the next leg is higher than the current leg altitude, complete the climb prior to the turnpoint. If the altitude for the next leg is lower than the current leg, do not initiate descent until over the turnpoint. Legs may be divided into segments for night altitude computations, depending on terrain differential or threats in order to allow flight closer to the terrain. Once the controlling obstacle or terrain feature is visually identified and the aircraft is confirmed well clear, the crew may descend to the next segmented altitude. NVG modified contour will not be flown. ***WARNING:*** If either the pilots' NVGs, SCNS, pressure altimeter, radar altimeter, GPS, or aircraft radar fail, climb to MSA until resolving the problem. In addition, climb to MSA to resolve any T.O. 1C-130(x)/(x)-1 Section III procedures, commensurate with the tactical situation.

16.3.1.3.1. Minimum altitude capable training will not descend below NVG en route altitude for the leg/segment being flown.

16.3.1.4. Minimum Safe Altitude (MSA). MSA in an initial VFR altitude that provides additional terrain clearance while the aircrew analyzes situations that require interruption of low-level operations (route disorientation and equipment malfunctions or when either pilot must leave the seat during low-level operations, etc.). Plan MSA at an indicated altitude of 500 feet above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation), or 400 feet plus one chart contour interval above the highest depicted terrain contour, whichever is highest, within 5 NM of route centerline to include

the aircraft turn radius. An MSA will be computed for each leg, route segment, or entire low-level route.

16.3.1.5. Emergency Safe Altitude (ESA). ESA is designed to provide positive IMC terrain clearance during emergency situations that require leaving the low-level structure. Planners may compute several ESAs for route segments transiting significant terrain differentials, or a single ESA for the entire low-level route. To compute ESA, add 1,000 feet (2,000 feet in mountainous terrain) to the elevation of the highest obstruction to flight within 22 NM either side of the planned route. An ESA will be computed for the route and conspicuously annotated on the chart.

16.3.1.6. Minimum altitudes for IFR operations within published Military Training Routes (MTRs) in US sovereign airspace will be the computed leg MSAs unless a higher altitude is required by FLIP AP/1B.

16.3.2. Airdrops will not be conducted below the following altitudes: ***WARNING:*** DZ surveys do not assure terrain and obstruction clearance. Planners and aircrews are responsible for ensuring clearance through mission planning/chart preparation.

16.3.2.1. Day VMC Drop Altitude. Fly minimum day VMC airdrop altitudes as specified in AFI 11-231, visually avoiding high terrain and obstacles in the vicinity of the drop zone.

16.3.2.2. Night VMC Drop Altitude. If not on NVGs fly minimum night VMC run-in altitudes, from slowdown through escape, at an indicated altitude of 500-feet above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation), or 400-feet plus one contour interval above the highest depicted terrain contour, whichever is higher, within 3 NM of run-in centerline. If on NVGs, fly NVG en route altitude through slowdown. After slowdown, when the drop zone is in sight and will remain in sight, or when a positive position is identified and adequate terrain clearance is assured, the aircraft may descend from run-in altitude to drop altitude specified in AFI 11-231, AMT, SPINS, or mission planning sheet.

16.3.2.3. IMC Drop Altitude. Fly minimum IMC drop altitudes at 500 feet above the highest obstruction to flight (man-made obstruction, terrain feature, or spot elevation), or 400 feet plus one contour interval above the highest depicted terrain contour, whichever is highest, within 3 nautical miles either side of the run-in centerline from DZ entry point to DZ exit point or as specified in AFI 11-231, whichever is higher.

16.3.2.3.1. DZ Entry Point. Formation descent will not begin until the last aircraft is at or past the DZ entry point.

16.3.3. Night VMC Tactical Approach Altitude. Compute IAW AFTP 3-3.25, Chapter 7.

16.3.4. Peacetime Route Restrictions. In addition to restrictions in AFI 11-202V3, specific country or theater of operations publications, and FLIP area planning, routes will not be flown:

16.3.4.1. With less than 1 NM separation (3 NMs in excess of 250 KIAS) when below 2,000 feet AGL from known sensitive environmental areas such as hospitals, fish hatcheries, ostrich and emu farms, large poultry complexes, recreation areas, institutions, and similar locations.

16.3.4.2. With less than 3 NMs separation from prohibited airspace.

16.3.4.3. Less than 3 NMs separation from nuclear power plants.

16.3.4.4. Through restricted airspace, except transition or termination in such areas where the planning unit is a primary using agency or has approval of the controlling agency.

16.3.4.5. In weather conditions less than specified in this AFI and AFI 11-202V3.

16.3.4.6. Below 1000' AGL within a 2000' radius over cities or towns shown as magenta shaded areas on 1:500,000 (TPC) scale charts.

16.3.4.7. Over or through active live fire or impact areas that may not be specifically designated as prohibited or restricted areas.

16.3.4.8. Below 500 feet AGL unless:

16.3.4.8.1. Host nation rules specifically allow such VFR operations.

16.3.4.8.2. Routes or training areas have been environmentally assessed and surveyed for 300-foot AGL operations. ***NOTE:*** This restriction does not apply to one-time-use routes. Consult FLIP AP/1B for published Military Training Route restrictions.

16.3.4.9. For the airdrop portion of all SKE missions filed under IFR, or for portions of IFR SKE routes flown in uncontrolled airspace, the mission command unit must comply with appropriate FAA exemptions. Provide a NOTAM to the FAA flight service station nearest the affected areas so that it is in-place at least 6 hours in advance of the intended activity, regardless of actual or forecast weather. NOTAM information will include:

16.3.4.9.1. Name of the nearest city or town and state.

16.3.4.9.2. Date and time period of intended activity.

16.3.4.9.3. Number and type of aircraft.

16.3.4.9.4. Altitudes.

16.3.4.9.5. IFR Drop Corridor Ingress and Egress points of the route segment expressed in radial and DME from a VORTAC.

16.3.5. Navigation Chart Preparation. Mission planners will construct a master chart for mission briefings and aircrew reference. Copilot and navigator crewmembers will use individual tactical navigation route charts for each mission. Low-level navigation charts will be annotated with any added, deleted, or changed information in the most recent CHUM or supplement. In no case will CHUM coverage be less than 22 NMs either side of the entire planned route of flight. Crews may trim charts to no less than 10 NMs after establishing the ESA. Color copies, if available, of a master chart reduce the probability of missing or misplotted data on aircrew charts.

16.3.5.1. Chart Annotation. Annotate the master chart with the applicable **Chapter 11** and AFTTP 3-3.25 requirements. Refer to AFTTP 3-3.25 and AFPAM 11-216 for detailed chart annotation symbology. An individual's chart annotations should have, as a minimum, turn points, IP, DZ, course line, course data, CHUM data, and ESA.

16.3.6. Mission Forms and Logs.

16.3.6.1. AF IMT 4053, **INS Flight Plan and Log**. An AF IMT 4053 should be used when planning tactical low level missions. A MAJCOM approved computer generated flight plan may be used in lieu of the AF IMT 4053.

16.3.6.2. AF IMT 4051, **Pilot's Low Level Airdrop Plan**. Pilots will complete and use either an AF IMT 4051 or AF IMT 70 for all low-level airdrop/airland missions. A log or stick diagram containing the same information or an aircrew flimsy page containing this information may be substituted for the AF IMT 4051/AF IMT 70.

16.3.6.3. AF IMT 4062, **C-130 Run-in/Drop Information Card**. Navigators/engineers will use the AF IMT 4062 to annotate pertinent information during all tactical missions.

16.3.7. Route Study. Crew route study is mandatory before accomplishing flight in the low level environment.

Chapter 17

AIRLAND EMPLOYMENT

17.1. General. This chapter provides guidance for general C-130 airland operations. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.25.

17.2. Passengers on Tactical Flights.

17.2.1. Passengers are allowed, including Space-A passengers, on any flight, single ship or formation that:

17.2.1.1. Is not air dropping or conducting NVG operations on that sortie. This restriction does not apply if specifically tasked in the mission frag, OPORD, or SPINS. Passengers receiving orientation flights are also exempt from this restriction. For JRTX/CAPSTONE missions, passengers are allowed on tactical flights conducting airdrop operations.

17.2.1.2. Meets the provisions of AFMAN 24-204 concerning passengers with hazardous cargo.

17.2.1.3. Is not prohibited by international agreement.

17.2.1.4. If on a SAAM, the user does not object to Space-A passengers.

17.2.2. Personnel, i.e., crew chiefs, tasked to support JA/ATT airdrop and/or airland operations are allowed on airdrop missions.

17.2.3. The PIC will report the number of seats available to aerial port/passenger terminal. Passengers will be briefed by passenger service personnel and may refuse transportation on tactical missions due to potential roughness of the flight at no loss to their order of priority for movement.

17.3. ARA. Use the following guidance when planning ARAs:

17.3.1. Day VMC. Plan a minimum of 300 feet AGL modified contour altitude above the terrain using visual references from the IP to a point where the approach begins. If a high approach is used, mark a start climb point.

17.3.2. Night VMC. ARAs will be planned for all night VMC tactical LZ operations IAW **Chapter 11**.

17.3.3. IMC. Except for contingencies, ARAs conducted in IMC must use approach plates published by the Defense Mapping Agency Aeronautical Center (DMAAC) or approved by MAJCOM. During contingencies, the MAJCOM A3/DO/XO, or DIRMOBFOR may approve IMC ARA approach plates. Units must comply with any restriction in FLIP or the host nation agreement, and receive written approval from ATC and airspace management authority.

17.4. Tactical Arrivals.

17.4.1. Low Altitude Arrivals. See AFTTP 3-3.25 for discussion of advantages/disadvantages and flight parameters for each arrival. These maneuvers may be

flown on continuation training and operational missions with passengers aboard. In all cases plan to roll out on final at approach speed no lower than 300 ft AGL.

17.4.2. High Altitude Arrivals. See AFTTP 3-3.25 for discussion of advantages/disadvantages and flight parameters for each arrival. These maneuvers may be flown on continuation training and operational missions with passengers aboard. In all cases plan to roll out on final at approach speed no lower than 300 ft AGL.

17.5. Engine Running On-load and Off-load (ERO) Procedures. Use ERO procedures when necessary to expedite aircraft or cargo movement, meet time requirements of unit moves, joint training exercises, and contingencies or enhance crew duty day. The PIC is responsible for prior coordination with 618 TACC or the controlling agency for early takeoffs. With the exception of small arms ammunition (Hazardous Class/Division 1.4), do not use ERO procedures when explosive cargo is involved unless authorized in the JA/ATT, exercise operation or contingency air tasking order. ERO procedures may be used for any mix of personnel or cargo. Material handling equipment should be used if palletized cargo is to be on-loaded or off-loaded. PICs must assess prevailing weather, lighting and parking location to ensure safe operations.

17.5.1. General Procedures.

17.5.1.1. PICs will brief crewmembers 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. Use wing leading edge and taxi lights to enhance safety at night as the situation dictates.

17.5.1.4. Station another crew member on interphone or public address (PA) in the cargo compartment as safety observer. Safety observers will remain forward of all cargo.

17.5.2. Offload Preparation/Procedures. Aerial delivery support (ADS) arms may be disconnected during descent checklist. Prior to landing, the loadmaster will brief all personnel in the cargo compartment regarding their locations, duties, and responsibilities during the ERO.

17.5.2.1. Brief drivers on the following items:

17.5.2.1.1. Exact offload procedures and applicable signals to be followed.

17.5.2.1.2. When cleared by the loadmaster, to assume their position. Actuate brake pedal sufficiently to ensure brakes are operational. Vehicles requiring a build-up of air pressure to provide brake pressure must delay pressure build-up until engine start.

17.5.2.1.3. The loadmaster will direct vehicle engines to be started when the aircraft comes to a complete stop and the cargo ramp and door are open.

17.5.2.1.4. Vehicle parking brakes will not be released until all restraint is removed and cleared by the loadmaster.

17.5.2.1.5. Vehicles will proceed directly aft of the aircraft at least 50 feet before turning and/or 300 feet before stopping.

17.5.2.2. Brief troops on the following items:

17.5.2.2.1. Secure baggage aboard vehicles, if applicable.

17.5.2.2.2. Deplane when directed by the loadmaster.

17.5.2.2.3. Proceed directly aft of the aircraft at least 50 feet before turning and/or 300 feet before stopping.

17.5.3. After the aircraft is slowed to taxi speed, the loadmaster may remove all tiedowns except one forward and one aft restraint, open the aft cargo door, and lower the ramp to approximately 12 inches above horizontal. ***WARNING:*** If a combat offload of pallets is to be accomplished before offloading vehicles, do not remove any vehicle restraint until after the combat offload is complete.

17.5.4. After clearance from the pilot, the loadmaster lowers the ramp, and clears off headset to direct on-load or off-load operations.

17.5.4.1. The loadmaster will direct all on-load and off-load operations using pre-briefed signals. Other qualified loadmasters (CRG, CRG, aerial port) may perform these duties; however, the aircraft loadmaster retains overall responsibility for the operation.

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

17.5.5.1. Passengers will be escorted by a crewmember or qualified CRG, CRG, aerial port, or airfield control (e.g. STT) personnel when enplaning or deplaning through the aft door and ramp.

17.5.5.2. Auxiliary ground loading ramps should be used.

17.5.5.3. Unless cargo size and location dictate otherwise, deplane passengers before cargo, and enplane after cargo.

17.5.6. Personnel on-load and off-load through the crew entrance door:

17.5.6.1. Station a crewmember (normally the loadmaster) on interphone with cord held taut at approximately 20-feet at an angle of 45-degrees from the aircraft axis.

17.5.6.2. Brief deplaning personnel to secure loose articles and remain forward of the interphone cord.

17.5.6.3. No enplaning personnel should approach the airplane until the loadmaster is in place. ***NOTE:*** If downloading to an empty aircraft, a DD365-4 is not required for the subsequent sortie.

17.5.7. Upload Preparation/Procedures. Review the passenger and cargo manifests, crew lists, and complete DD365-4 for the subsequent sortie.

17.5.7.1. Loadmasters may use the load plan total weight and load center of balance (CB) for entry on the DD365-4 provided these procedures are followed:

17.5.7.1.1. The load plan data must be checked and validated by a qualified load plan validator i.e., aircraft loadmaster, aerial port specialist, or any individual who has completed the AMC Affiliation Program Airlift Planners Course.

17.5.7.1.2. The load plan validator will legibly sign the signature block on the load plan with name, rank, and organization.

17.5.7.1.3. The load must be placed on the aircraft exactly according to the load plan.

17.5.7.1.4. Prior to flight, if there is any doubt by loadmasters on the accuracy of the load plan weight or CB, then the loadmaster must accomplish the DD365-4 by station loading each individual item.

17.5.8. After completion of on-load or off-load, secure the ground loading ramp(s) in the installed position (if mission dictates), in the cargo compartment, or stow them in the aft cargo door.

17.5.9. AE Engines Running On-loads. For AE missions requiring engine running on-loads/off-loads, see **Chapter 20**.

17.5.10. Resume taxi after coordination with the loadmaster. ***CAUTION:*** Ramp should be raised to approximately 12-inches above the horizontal position prior to taxi.

17.6. Combat Off-load Procedures. The controlling C2 commander, MAJCOM A3/DO/XO or the commander, or DIRMOBFOR may authorize combat offload when conditions warrant. The method of combat offload will be determined by the aircrew based on the conditions at the offload site. Unit OG/CC may approve unilateral combat offload training.

17.6.1. Cargo pallets, airdrop platforms, and CDS containers can be offloaded without damage to the aircraft with the cargo ramp in the horizontal position. Use the following methods for combat offload operations.

17.6.1.1. Method "A." Use this method to offload single, multiple, ramp or married pallets, airdrop platforms, and CDS containers. Pallets, platforms, or CDS may be offloaded in a train like fashion or one-by-one as the situation dictates.

WARNING: Many explosive items have specific "drop" criteria that, if exceeded, render the item useless or dangerous to the user. With the exception of small arms ammunition (hazard class and division 1.4), explosives and munitions shall not be combat offloaded without approval of MAJCOM/A3/DO.

EXCEPTION: Explosives and munitions rigged for airdrop may be combat offloaded without MAJCOM/A3/DO approval.

CAUTION: A taxiway or ramp at least 500 feet long is required, however, 1,000 feet is desired to provide a margin of safety. When pallets, platforms, or containers are offloaded one at a time, use a longer taxiway based on the number to be offloaded.

NOTE: Combat offload of fragile and sensitive cargo items (i.e., computers) that might be damaged by standard method “A” combat offload procedures will not be attempted without user concurrence. If the nature of the mission dictates that cargo must be offloaded, aircrews may lower the ramp to approximately 18 inches above the ground.

17.6.1.1.1. Single or double/triple married pallets may be offloaded, without ballast, using this method provided their weight does not exceed 12,000 pounds, and the height of the pallets fall within cargo height jettison limit in section III of the flight manual or Chapter 5 of the cargo loading manual.

17.6.1.1.2. Airdrop rigged platforms up to 24 feet in length may be offloaded, without ballast, using this method provided their weight does not exceed 12,000 pounds.

NOTE: Single or married pallets and airdrop rigged platforms over 12,000 pounds may be offloaded using this method, provided ballast or cargo equal to the difference between 12,000 pounds and the weight of the pallets or platforms (to be offloaded) remains in C through F compartments during offload. **Example:** A 17,000 pound married pallet or airdrop platform requires 5,000 pounds of ballast or cargo to remain in C through F compartments during the offload.

17.6.1.1.3. CDS bundles may be combat offloaded using this method. The static line retriever will be used via manual activation; manual gate cut may be done if the retriever is inoperative. With the Centerline Vertical Restraint (CVR), offload must be accomplished one side at a time if the total bundle weight exceeds 12,000 pounds. Non-CVR single stick may be offloaded if the total weight is less than 12,000 pounds. Without the CVR, if the total weight of the bundles exceeds 12,000 pounds, bundles should be restrained in groups of four or less and offloaded one group at a time. For the unplanned combat offload of non-CVR bundles, restrain the bundles as described above. Perform an initial offload via the static line retriever, and on sequential offload remove aft restraint before clearing the pilot to taxi. Consider the slope of the offload site, which may cause bundles to roll aft upon removal of restraint.

CAUTION: When using method "A" on excessively rough, sharply undulating, or battle-damaged surfaces, damage to the aircraft ramp may occur. Reducing forward taxi speed on these surfaces will reduce aircraft oscillation. The PIC must determine if the offload area will permit the offload operation to be conducted without damage to the aircraft or equipment.

17.6.1.2. Method “B.” Use this method to offload married pallets that do not fit the category for method “A” or for which no ballast is available for married pallets weighing between 12,000 to 15,000 pounds. Use four serviceable steel 55-gallon drums under each pallet to be offloaded. The correct number of steel drums needed to complete this type of offload must be available at the offload site or must accompany the load when conditions at the offload site are unknown.

WARNING: The maximum weight for pallets to be off-loaded across the ramp at any one time when using method “B” is 15,000 pounds for C-130E, and H aircraft.

WARNING: Do not use method “B” for airdrop-rigged platforms to prevent binding the platform under the vertical restraint rails.

17.6.2. Aircrew Procedures:

17.6.2.1. Prior to commencing combat offload operations, the pilot will brief each crewmember on the method to be used. Specific procedures are in the expanded checklist. The pilot will coordinate tasks.

17.6.2.2. All crewmembers participating in the offload will refer to the checklist. Report any problem to the pilot immediately.

17.6.2.3. If other individuals must be aboard to assist the crew in an unusual circumstance, give them a thorough safety and procedures briefing for the entire offload sequence.

17.6.2.4. A safety observer will take position at the bottom of the flight deck steps on interphone and PA and transmit warnings through all speakers of the PA system to help the loadmaster enforce all safety precautions.

17.6.2.5. The loadmaster will maintain constant interphone contact with the PIC and is the only crewmember authorized to operate the dual rail locks during combat offload operations.

WARNING: During the entire offload operation, no one is permitted behind or beside the load unless the loadmaster checks that all rail locks are locked and engaged in the pallet detents or secures' each pallet to aircraft tiedown rings to ensure positive aft restraint.

WARNING: Always maintain forward restraint with the right-hand locks.

17.7. Emergency Airlift of Personnel. Use these procedures for emergency airlift of personnel from areas faced with enemy siege or hostile fire; or use these when directed by the controlling component commander, MAJCOM A3/DO or DIRMOBFOR. See Chapter 20 for emergency airlift of litter patients.

17.7.1. Emergency airlift of this nature will normally be accomplished without the use of individual seats, seat belts, or litter stanchions. Passengers will be seated on the cargo floor/ramp. The number of personnel will vary depending on size and the number of tiedown straps on board the aircraft. Personnel may be loaded in groups of 12 to 16 (depending on size) to control loading operations. Ambulatory combat floor loading will not be performed on non-combat missions.

17.7.2. General Procedures:

17.7.2.1. When available, mattresses or other cushioning material may be used for seating.

17.7.2.2. When available, a pallet subfloor may be installed.

17.7.2.3. When a pallet subfloor is installed, or when the intermediate rollers are removed from the aircraft, use the rail rings for attaching the tiedown strap used for forward restraint and body stability.

17.7.2.4. When a pallet subfloor is not used, consider removing the intermediate rollers from the aircraft, mission conditions permitting.

17.7.2.5. When the intermediate rollers are not removed from the aircraft, secure them on the outboard rails.

17.7.2.6. Seat troops, passengers, and ambulatory patients facing forward.

17.7.2.7. Attach a tiedown strap for each row of personnel to provide forward restraint and body stability.

17.7.2.8. When the intermediate rails are stacked on top of the outboard rails, use floor rings for attaching the straps. In this situation, the available seating space is decreased, and the number of passengers must be decreased.

17.7.2.9. Secure baggage on the cargo ramp/floor. Excess baggage and cargo secured on the cargo ramp/floor will decrease the number of troops, passengers, and patients proportionately.

17.7.3. The maximum altitude for emergency airlift will not exceed FL250.

17.8. NVG Airland. ***NOTE:*** ALZ lighting patterns will be IAW AFI 13-217. AMP 4 (blacked out runways) are not authorized. The PIC must ensure TOLD data reflects the possibility for a landing at the end of the zone (subtract landing/safety zone distances from runway available to ensure adequate runway exists for rollout).

17.8.1. NVG Approaches and Landings. The navigator will program a backup ARA approach in SCNS and configure the radar to monitor the approach course to assist the pilot in LZ acquisition, approach, and landing.

17.8.1.1. Checklist Procedures. Normal T. O. checklists will be used.

17.8.1.2. NVG Max Effort Operations. NVG max effort operations are approved for crews trained and certified.

17.8.1.3. NVG Formation Departures/Arrivals. All crewmembers (minus the loadmasters) must be NVG airland certified or under the direct supervision of an instructor before performing NVG formation departures/arrivals. The mission commander will thoroughly brief NVG formation departures/arrivals to include emergency procedures, abort calls, light discipline, runway markings, etc.

17.8.1.4. Crew Coordination. Coordinated actions during the final segment of an NVG approach and landing are critical.

17.8.1.4.1. Navigator Duties. In addition to backing up the pilots with the radar, while on final the navigator should call altitude alerts every 100' (or as requested by the pilot) and is required to call when descending through 100', 50', 25', and 10'. On departure the navigator will call out passing 50', 100', 200', 300' and 400' AGL, and will ensure terrain clearance with the radar.

17.8.1.4.2. Copilot Duties. Beginning at 300' AGL, copilots will verbalize airspeed and rate of descent ("107, down 6" indicates 107 KIAS and a minus 600 VVI). Copilots should also call out when passing 60 KIAS on landing roll.

17.8.1.4.3. Engineer Duties. The engineer's primary job is to monitor engine instruments and ensure checklist completion. The pilot should brief the engineer of any additional crew coordination requirements.

17.8.1.5. Tactical VFR Approaches. While VFR approaches afford flexibility in axis of approach, they demand thorough preflight planning and coordinated aircrew actions. The PIC will consider all mission aspects, including individual crewmember proficiency/qualifications when selecting an appropriate tactical VFR approach. For tactical VFR approaches, bank angle will not exceed 45 degrees and the aircraft will not descend below 500' AGL until intercepting a normal glide path approaching the final approach course and in a safe position to land. The first pilot to acquire the landing zone should state "Pilot/Copilot has the LZ". The next pilot to acquire the zone should announce "Pilot/Copilot has the LZ at (state clock position)".

17.8.1.6. IMC Approaches. IMC approaches may be flown by either pilot. The pilot flying may execute the instrument approach with NVGs down but shall not use NVGs during the instrument portion (pilot flying will have to "look under" the NVGs for instrument crosscheck). The transfer of aircraft control for the landing will be no lower

than 300' AGL. Altitude advisories shall be in accordance with earlier chapters of this regulation. The first pilot to acquire the landing zone should state "Pilot/Copilot has the LZ". The next pilot to acquire the zone should announce "Pilot/Copilot has the LZ at (state clock position)".

17.8.2. Ground Operations.

17.8.2.1. ERO. It is recommended that LMs use NVGs to maintain situational awareness. Blacked out operations are prohibited.

17.8.2.2. Taxi/backing. Pilots may taxi using NVGs on airfields without lights (blacked out) or equipped with overt or covert lights. If taxiing or accomplishing ground ops on blacked out taxiways/runways/ramps, the PIC will ensure aircraft or environmental lighting provides for clear definition of taxiway/runway/ramp edge. Comply with all taxi restrictions in **Chapter 5** and the GDSS/GDSS2(when available)/ASRR. The LM may provide the pilot with directions to taxi the aircraft while using NVGs. ***WARNING:*** If ever in doubt as to obstruction clearance, stop the aircraft, obtain additional wing walkers/marshallers and/or deplane crewmembers to act as wing walkers.

17.8.2.3. Combat Offloads. Crews may accomplish Combat Offloads on NVGs provided aircraft or airfield lighting permit clear definition of taxiway/runway/ramp edges.

Chapter 18

AIRCRAFT FORMATION

18.1. General. The standard formation building block is a two-ship element. Techniques to fly C-130 formation are outlined in AFTTP 3-3.25. Formation procedures will be conducted in accordance with this chapter and the airdrop technical order. Consider safety, aircrew capability, proficiency, survivability and user needs when planning any formation tactic.

18.2. Specified Times. The mission commander determines the sequence of events and mission times based on ATO, fragmentation order, and staff input, fuel requirements, parachutist/passenger comfort, taxi distances, briefing requirements, etc.

18.3. Weather Minimums.

18.3.1. Formation takeoff and landing minimums are the minimums for the airport navigation aid used, but not lower than 200 feet and one-mile visibility (RVR 50). During IFR formation operations, adhere to both ceiling and visibility minimums. If departure ceiling or visibility is below published landing minimums, but above 200 feet and one-mile visibility (RVR 50), the formation may take off if the requirements for a departure alternate as prescribed in **Chapter 6**, are met. If the runway has dual RVR readouts (approach and departure end of the runway) both ends must be at least RVR 50.

18.3.1.1. Weather minimums for NVG formation departures are 300/1 or approach minimums (whichever is higher).

18.4. Ground Operations.

18.4.1. Minimum taxi interval is one aircraft length with four engines operating and two aircraft lengths with two engines operating. Formation lead may increase taxi intervals if circumstances dictate.

18.5. Takeoff.

18.5.1. The minimum takeoff interval between aircraft is 15-seconds.

18.5.2. For aborts during takeoff, the navigator immediately transmits an abort call (three times using formation position number) on interplane and the copilot on primary frequency. Clear the runway as quickly as safety allows. Succeeding aircraft not on takeoff roll will hold until the runway is clear.

NOTE: For aircraft without “hot mike” capability on primary radio, the navigator transmits the abort call on primary, and the copilot (or navigator if the copilot is occupied with emergency procedures) transmits on interplane.

NOTE: Consider not using Have Quick or secure radio for interplane during takeoff.

18.5.3. Do not advance power above flight idle until takeoff roll is started.

18.6. Altimeter Setting. Formation leaders will ensure all aircraft use the same altimeter setting.

18.7. Formations.

18.7.1. Formations will normally consist of 2-ship elements. During mission planning, mission commanders will choose a formation geometry appropriate to the mission and tactical situation. At no time will aircraft be operated within 500 feet of another aircraft.

18.7.2. Airspeed Changes. Lead will announce airspeed changes of 15-knots or greater at night.

18.7.3. Inadvertent weather penetration procedures will be briefed to the formation. At a minimum, formation lead will direct the formation to a safe altitude, heading, airspeed, and aircraft spacing. Refer to AFTTP 3-3.25 for inadvertent weather penetration procedures.

18.8. Visual Geometries.

18.8.1. Basic visual spacing will be 2000-6000 feet between aircraft in an element and 8000 feet between element leads. SKE must be operational for night, unaided visual formations or the formation is restricted to 2000 feet in-trail. The optimal formation composition and geometry will depend on mission requirement, theater restrictions, terrain, and the tactical situation.

18.8.1.1. Flight leads will brief visual formation contracts.

18.8.2. Visual Geometries that may be flown are:

18.8.2.1. In-Trail.

18.8.2.2. Wedge.

18.8.2.3. Fluid Trail.

18.8.2.4. Line Abreast.

18.8.2.5. Modified “V”.

18.8.3. Night Geometries. Crews may fly visual in trail, fluid trail, and tactical formation maneuvering (TFM) during night NVG formation tactical missions. To fly night TFM, use the following guidance:

18.8.3.1. NVGs will be used.

18.8.3.2. Formation contracts and verbal signals will be pre-briefed.

18.8.3.3. SKE must be operational.

18.8.3.4. Due to aircraft limitations, use line abreast NVG formation only when required by the tactical situation.

18.8.3.5. Shackles, cross turns, and half cross turns should be limited to times when necessary for formation maneuvering. Verbal signals must be used. Normally, shackle, cross turn, and half cross turn training should be conducted during day VMC. ***WARNING:*** When flying at night, rapid changes in airspeed, altitude, bank angles, “G” loads and aircraft position necessitated by the performance of these maneuvers increase the potential for spatial disorientation.

18.8.3.6. The MC will brief lighting procedures (if the wingman calls “blind”, etc.).

18.8.3.7. Fly 2-ship elements.

18.8.3.8. Wingmen should avoid flying the line right/left positions for extended periods of time.

18.8.3.9. Fluid trail spacing will be no closer than 2000' between aircraft.

18.8.4. NVG Threat Reactions for Training. NVGs are required for night threat reactions. Crews must exercise vigilance to ensure the aircraft remains within the NVG en-route altitude corridor or climb to MSA while conducting threat reactions. ***NOTE:*** Any crewmember will call "Terminate" if they observe the aircraft being flown outside the above parameters.

18.9. Visual Rejoins.

18.9.1. Rejoining aircraft will maintain 500 feet above or below the formation until the formation is in sight and clearance to rejoin is granted.

18.9.2. Rejoining aircraft must be in position at formation altitude by "green light" to accomplish the drop.

18.10. Tactical Formation Maneuver Restrictions.

18.10.1. Day VMC: No restriction.

18.10.2. Night VMC: Must be accomplished on NVGs.

18.11. Visual Slowdown Procedures.

18.11.1. Unless tactically unsound, night slowdowns will include an aural or visual signal.

18.12. Visual Airdrop Procedures.

18.12.1. Minimum spacing for CDS airdrops is 6,000 feet between aircraft. ***WARNING:*** Attempting to regain position by only reducing power or airspeed places the aircraft in a nose high, low-power situation and may lead to a stall.

18.13. Visual Recovery. Lead determines the type of visual recovery based upon formation geometry, threat scenario, traffic pattern, traffic flow, etc. Attain traffic pattern altitude and airspeed before arriving at the recovery field.

18.13.1. Downwind Recovery.

18.13.1.1. Roll out on final at no less than 300 feet AGL. Aircraft will not descend below preceding aircraft during the recovery.

18.13.2. Overhead Recovery.

18.13.2.1. Roll out on final at no less than 300 feet AGL. Aircraft will not descend below preceding aircraft during the recovery.

18.14. Landing. The desired landing interval is 20 seconds, minimum 15 seconds. ***WARNING:*** Do not perform touch-and-go landings during formation recoveries.

18.15. SKE Procedures.

18.15.1. Use the pressure altimeter and GSI to monitor altitude during climb or descent The formation lead announces the altitude passing each 2,000 feet (including departure and recovery). All aircraft report reaching assigned altitude in sequence to the formation leader.

Formation lead will not report the formation level to ATC until all aircraft have reported level at the assigned altitude.

18.15.2. Priority of FCI signals are: altitude, heading and airspeed.

18.15.3. Unless otherwise briefed, spacing between aircraft will be 4000 feet and spacing between element leads will be 8000 feet. Minimum SKE spacing is 4000 feet between aircraft.

18.15.4. Lead will signal turns of 10 degrees or more and airspeed changes of 10 KIAS or more.

18.15.5. Element leads will not exceed 20 degrees of bank.

18.16. Loss of SKE-Individual Aircraft. Notify lead in all cases.

18.16.1. VMC.

18.16.1.1. If only the DVST/PPI is inoperative aircraft may elect to maintain position with lead's concurrence. The route, drop, and recovery may be flown. ***NOTE:*** Consider using air-to-air TACAN or radar to maintain spacing.

18.16.2. IMC.

18.16.2.1. Loss of all SKE indications will require a breakout. Use the following procedure if an alternate plan was not briefed:

18.16.2.2. If the formation is in straight and level flight climb 500 feet, turn 30 degrees in the safest direction from the base heading for 30 seconds, and then return to base heading. If the formation is in a turn roll out and climb 500 feet. Lead will contact (or direct contact to) ATC for a separate clearance. ***CAUTION:*** Performing the above maneuvers in a radar pattern may place an aircraft outside of protected airspace.

18.17. SKE Rejoins.

18.17.1. Set leader number as required to the formation according to lead's direction and enable all formation slot numbers.

18.17.2. Set "range" X 1,000 feet" switch at maximum range.

18.17.3. Approach the formation from 1,000 feet above or below the formation.

18.17.4. Establish radio contact with the formation. Confirm SKE frequency and appropriate leader's slot number.

18.17.5. When the formation appears on the plan position indicator (PPI)/Direct View Storage Tube (DVST), check that the master lost indications have been extinguished.

18.17.6. The rejoining aircraft will identify the appropriate element leader. Upon positive identification, lead completes an FCI check prior to the rejoin.

18.17.7. Join in position while maintaining 1,000 feet altitude separation. When stabilized in position and the last formation aircraft is positively identified, request rejoin clearance from lead and climb or descend to formation altitude.

18.17.8. The rejoining aircraft must be stabilized in position at formation altitude by the IP (IMC) or by one-minute prior to the TOT (VMC) to accomplish the drop.

18.18. SKE Airdrop Procedures.

18.18.1. All aircraft will use formation lead's drift to determine SKE crosstrack. Non-AWADS formation aircraft must ensure they use the same ballistic wind for identical SCNS programming. AWADS formation aircraft may use their own computed wind. After level at drop altitude, formation lead will pass back revised drift and ballistic winds if different.

18.18.2. Slowdown. The entire formation will slowdown simultaneously. Lead signals 30 seconds prior to slowdown with the SKE "SD" button. Lead transmits a 5-second "-" prep. Lead initiates slowdown with the FCI "E" and a radio call (tactical situation permitting). After slowdown, element leads will not exceed 10 degrees of bank.

18.18.2.1. Descending Slowdown. Upon reaching 140 KIAS, the formation may descend to drop altitude. Start descent using 140 KIAS and 1,000 feet per minute until reaching drop altitude. Do not initiate descent until the following conditions are met:

18.18.2.1.1. Lead position is positively identified.

18.18.2.1.2. The entire formation is within 3 NMs of DZ run-in course centerline.

18.18.2.1.3. The last aircraft in the formation is at or past the DZ entry point (or the last aircraft in the flight or element if using the waterfall descent procedures.).

18.18.3. Each element stacks 50-feet above the preceding element's drop altitude. Wingmen maintain the same drop altitude as their element leaders by reference to the pressure altimeter and SKE TWS. For large formations, i.e., greater than two flights, all aircraft within a flight will maintain the same drop altitude with following flights stacking 50-feet above the preceding flight's drop altitude.

WARNING: Analyze pre-drop gross weight to determine if obstructions can be cleared with one engine inoperative. If obstruction clearance cannot be met, adjust the number of aircraft, reduce aircraft gross weight, revise run-in and/or escape course, or increase drop altitude.

NOTE: Do not attempt AWADS/SKE airdrops in areas of thunderstorm activity, heavy precipitation, or during icing conditions.

18.18.4. During the run-in, element leaders will maintain formation position in relation to their flight leader (TWS) until they are established on drop altitude and airspeed. When these two requirements are met, element leaders are cleared their own independent run-in to their own CARP.

18.18.5. Non-AWADS element leads must verify SCNS accuracy via visual ground references or SCNS ETE timing window, TWS, and SCNS XTRK, as prescribed in AFTTP 3-3.25, not earlier than the one-minute advisory and not later than the 5 second advisory.

18.19. SKE Formation Landing.

18.19.1. The interval between aircraft for landing is 6,000 feet desired, 5,000 feet minimum.

18.20. C-130E/H/J Interfly Procedures.

18.20.1. When a C-130E/H departs behind a C-130J, use a 15-second minimum takeoff interval. When a C-130J departs behind a C-130E/H, use a 25-second minimum takeoff interval to ensure an adequate safety margin for wake vortices and to prevent compression on

takeoff. For safety purposes, the above assumes all aircraft use their standard takeoff power setting for the formation takeoff.

18.20.2. SKE Enroute Spacing. All CAPS/SKE formations are flown with standard 2-ship elements. ***EXCEPTION:*** The wingman in each element maintains 4000 feet ITRK (A-PATH) from their element, with 500 feet XTRK (X-PATH) to the right of lead.

Chapter 19

AIRDROP

19.1. General. This chapter provides guidance for C-130 airdrop operations. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.25.

19.1.1. Airdrop above 3000 feet AGL. Equipment and CDS drops performed above 3000 AGL will be made using one of the following methods: AWADS, Ground Radar Aerial Delivery System (GRADS), or a radar beacon airdrop. A SKE wingman may execute a SKE timing drop provided the leader navigates to the release point by AWADS, GRADS, or a radar beacon.

19.2. Identification of Airdrop Items. It may be necessary to identify items that are not dropped or land off the DZ in unsecured areas.

19.2.1. Identify supplies or equipment by the following class numbering system:

19.2.1.1. Class I - Subsistence.

19.2.1.2. Class II - Individual equipment.

19.2.1.3. Class III - POL.

19.2.1.4. Class IV - Construction materials.

19.2.1.5. Class V - Ammunition (include the type):

19.2.1.5.1. Type “A” - Small arms.

19.2.1.5.2. Type “B” - Mortars.

19.2.1.5.3. Type “C” - Artillery.

19.2.1.6. Class VI - Personal demand items.

19.2.1.7. Class VII - Major end items (vehicles, howitzers, etc.).

19.2.1.8. Class VIII - Medical supplies.

19.2.1.9. Class IX - Repair parts.

19.2.1.10. Class X - Non-military programs (i.e. agricultural supplies).

19.2.2. Airdrop loads may also be identified by the following internationally recognized color coding system for combined operations:

19.2.2.1. Red - Ammunition and weapons.

19.2.2.2. Blue - Fuel and lubricants.

19.2.2.3. Green - Rations and water.

19.2.2.4. Yellow - Communications equipment.

19.2.2.5. White (or Red Cross on white background) - Medical supplies.

19.2.2.6. Black and white stripes - Mail.

19.3. Airdrop Kits. The loadmaster will carry enough equipment in the airdrop kit to satisfy load or mission requirements. Minimum contents of airdrop kits will include cloth-backed pressure sensitive tape, masking tape, 1/2-inch tubular nylon cord, 550 cord, 5 cord, 80 pound cotton webbing, one carabiner (NSN 4240-01295-4305 or equivalent carabiner with a locking mechanism), and two small G-14 clevises.

19.4. Joint Air Drop Inspection.

19.4.1. The loadmaster will complete the applicable DD Forms 1748, *Joint Air Drop Inspection Records*, before takeoff (see AFJI 13-210 for specifics) and verify the accuracy of cargo and troop documentation. The Joint Airdrop Inspector will check all possible items for all loads to be dropped during that mission. For loads that require in-flight rigging, the Joint Airdrop Inspector will annotate on the DD Forms 1748 which items are required to be completed during flight, and the aircrew loadmasters will ensure those items are completed and checked. No further inspections by the Joint Airdrop Inspector are required.

19.4.2. If loads to be airdropped (and loads to be airlanded) are carried at the same time, see the restrictions listed in **Table 19.1**. These restrictions are designed to prevent airland loads from interfering with airdrop rigging equipment.

Table 19.1. Load Planning Restrictions.

	RESTRICTIONS	MINIMUM DISTANCE (INCHES)
1.	ANCHOR CABLE HEIGHT FROM AIRCRAFT FLOOR	80”
2.	RETRIEVER WINCH CABLE/PULLEY FROM AIRCRAFT FLOOR	84”
3.	DISTANCE BETWEEN ANCHOR CABLES; (a) CDS OR EQUIPMENT (b) PERSONNEL 1 (1) FORWARD BULKHEAD (2) INTERMEDIATE SUPPORTS	 108” 6" INBOARD, 64" OUTBOARD 76" INBOARD, 76" OUTBOARD
4.	AIRLAND CARGO HEIGHT	CANNOT INTERFERE WITH OVERHEAD RIGGING EQUIPMENT CDS ONLY -- 80" HEIGHT[2]
5.	CARGO LOCATIONS ON PERSONNEL AIRDROPS (STATIC LINE OR HALO)	TROOP DOOR EXIT: NO CARGO BETWEEN FS 657-737. RAMP EXIT: FORWARD OF FS 700.

	RESTRICTIONS	MINIMUM DISTANCE (INCHES)
6.	PERSONNEL DISTANCE FROM AIRDROP RIGGING EQUIPMENT	60"
7.	SAFETY AISLE TO REAR OF AIRCRAFT[3]	ALL MISSIONS, ALONGSIDE OR OVER TOP OF CARGO
8.	ACCESS TO DUAL RAIL CONTROL HANDLES	CANVAS SEATS NOT USED 1L AND 2L
9.	ACCESS TO OPERATE CDS EQUIPMENT	CANVAS SEATS NOT USED 1L AND 2L.

NOTES:

1. Personnel airdrops may be performed with only one troop door configured for airdrop with user concurrence.

2. Will not exceed 80 “within 12” either side of retriever cable. Height of cargo outside of the 12" left and right (total 24") may exceed the 80" height limitation, but will not interfere with overhead rigging equipment.

3. CDS and heavy equipment configuration. A maximum of three rows of canvas seats may be used. The remaining vacant row serves as a safety aisle. All sidewall seats will be raised or stowed in the wheel-well area when airland pallets and vehicles are located within this area and exceed 96" width.

19.5. Verification of Load Information. The navigator will verify the actual number and type of parachutes, load weights, sequence of extraction, and position of loads in the aircraft agree with planned CARP data. If an individual load has a different type or number of parachutes from other loads, compute a CARP for each load to ensure all loads will land on the DZ. Base drop altitude on the item requiring the highest drop altitude.

19.6. Marking Airdrop Loads. For training missions (e.g. unilateral, exercise, or JA/ATT) the navigator will mark all equipment and standard airdrop training bundles with the aircraft call sign and date. If more than one load is dropped on the same pass, mark loads with order of exit from aircraft. Markings will be placed on the extracted end of the load, and also between the extraction parachute and attachment to the floor. ***EXCEPTION***: If more than one CDS bundle is dropped on the same pass, mark only the first container out.

19.7. DZ Markings. Plan and coordinate DZ markings according to AFI 13-217.

19.8. Safety Equipment.

19.8.1. Personnel required to be mobile in the cargo compartment during low-level phases will wear protective headgear from the combat entry point to the combat exit point if an actual threat is briefed. ***EXCEPTION:*** Personnel performing water jumps. All other personnel will be seated with the seat belt fastened. Check helmet boom mike during preflight. Loadmasters will lower their helmet visor (except when NVGs are used) before opening any doors and keep them lowered until doors are closed. As a minimum, the helmet

will be worn from the start of the pre-slowdown checklist until the completion of the drop checklist. Loadmasters will be on interphone from completion of pre-slowdown checks until completion of the drop checklist. ***EXCEPTION:*** For heavy equipment airdrop, both loadmasters will be on interphone prior to retracting the left rail locks in case of a loose platform.

19.8.2. During airdrops, loadmasters will wear either a restraint harness, or a parachute, from the pre-slowdown checklist until doors are closed and locked. When using a restraint harness, loadmasters performing duties near an open ramp and/or door in-flight will attach the lifeline IAW paragraph **19.8.3**

19.8.3. When used, fit the restraint harness and adjust the lifeline before flight as follows:

19.8.3.1. Troop door personnel drops. Connect the hook to tiedown ring 26D and adjust the lifeline to allow mobility only to the troop door for installation of the paratroop retrieval strap/bar and to accomplish other emergency procedures. When dropping with CVR sections 2 and 3 installed, connect the hook to the CVR tiedown ring 25D.

19.8.3.2. Troop door SATB drops. Connect the lifeline as described in paragraph **19.8.3.1** or to a floor/dual rail tiedown ring at FS 657 and adjust to allow mobility only to the troop door being used.

19.8.3.3. Ramp and door operations. (See para. **19.8.3.3.1** for ICDS/JPADS guidance). Connect the hook to a floor/dual rail tiedown ring at FS 677, adjusting to a point that will preclude the wearer from exiting the aircraft. Restraint harness lifelines may be attached to an unused anchor cable provided the anchor cable stop is positioned and taped at FS 677.

WARNING: Except for an actual contingency, towed trooper, 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 loadmaster to fall outside the aircraft.

19.8.3.3.1. ICDS/JPADS operations. When pre-flighting the restraint harness for dropsonde airdrops, pre-measure the harness with the ramp in the closed position. Connect the hook to a floor/dual rail tiedown ring at FS 737, adjusting to a point that will preclude the wearer from exiting the aircraft. For the subsequent cargo airdrop, connect the hook to floor/dual rail tiedown ring no further aft than FS 677, adjusting to a point that will preclude the wearer from exiting the aircraft. Restraint harness lifelines may be attached to an unused anchor cable provided the anchor cable stop is positioned and taped at FS 677.

19.8.4. Loadmasters will wear a LPU for operations over bodies of water when doors are open and a parachute is worn or with restraint harness below 2000 feet.

19.8.5. During an airdrop, occupants in the cargo compartment will either have a seat belt fastened, wear a restraint harness, or wear a parachute before doors are opened. ***EXCEPTION:*** Flight examiner loadmasters are exempt from wearing a parachute or restraint harness while conducting flight evaluations provided they do not go aft of FS 677. For static line jumps, static lines are attached to anchor cables before doors are opened. ***EXCEPTION:*** Jumpers exiting on subsequent passes (racetracks) may stand and hook up with doors open if

they are forward of the aft edge of the wheel wells (FS 617.) ***NOTE***: Do not use flight deck restraint harness for airdrops.

19.8.6. Parachutes for safety personnel will not be provided.

19.9. Secure En Route Communications Package (SECOMP). Use of SECOMP will cease at the discretion of the PIC if it interferes with either aircraft equipment or an aircraft emergency condition.

19.10. Airdrop Weather Minimums and Wind Restrictions. Comply with published AFI 11-202V3 and FLIP VFR weather minimums for visual airdrops. For non-CONUS VFR airdrops, comply with host nation VFR criteria if more restrictive than AFI 11-202V3. Comply with AFI 13-217 for minimum DZ weather/wind restrictions.

19.11. Tactical Checklists. Tactical checklists found in the applicable T.O. 1C-130xx-1 will be used.

19.11.1. During the PIC's crew briefing, the pilot, navigator, and loadmaster will coordinate appropriate times or geographical location for execution of all tactical checklists. The time required by the loadmaster will determine when checklists must be accomplished en route. Complete all items of the preceding checklist before beginning the next checklist. The combat entry checklist will be accomplished prior to entering the tactical or threat environment or when deemed necessary by the PIC.

EXCEPTION: The "SLOWDOWN CHECKLIST" may still be in progress after the "ONE MINUTE ADVISORY".

19.11.2. The "twenty minute", "ten minute", "one minute", and "five second" advisories are required for all personnel airdrops. Only the "one minute" and "five second" advisories are required for equipment and CDS airdrops. Additional advisories may be provided at crew discretion if requested by the user and pre-coordinated with the aircrew.

NOTE: Loadmaster will ensure jumpmasters receive all time advisories, wind updates, and no-drop decision when passed.

19.11.3. The navigator will give accurate time advisories regardless of the tactical checklist in progress. Advisories are based on planned TOT up to slowdown. After this point, all advisories are based on green light time from the DZ.

NOTE: During personnel airdrops, the aircraft must be at or above drop altitude and stable not later than one minute out (two minutes out for jumpmaster directed drops) to allow the jumpmaster access to the paratroop door.

NOTE: The loadmaster will notify the PIC when an emergency condition exists in the cargo compartment, complete the required emergency checklist and report completion of the malfunction checklist or status. Normal tactical checklists are resumed if possible. If not possible, proceed with the completion of drop checklist.

19.12. Airdrop Altitudes and Airspeeds. See AFI 11-231 for specific airdrop altitudes and airspeeds. The aircraft must be level at drop altitude and on drop airspeed by green light time. Slowdown during personnel drops should be planned to allow jumpmaster access to paratroop doors NLT 1-minute before TOT (2-minutes for jumpmaster directed drops).

19.13. No Drop Decisions. ***WARNING:*** Should the crew believe the drop will occur outside of safe parameters, they will call “no drop” and ensure the red light is illuminated.

19.13.1. Before the "one minute advisory" call, any crewmember observing a condition that could jeopardize a safe drop will notify the PIC. After the one-minute advisory, any crewmember observing a condition that could jeopardize a safe drop will transmit a "no drop" call on interphone. The PM and loadmaster will acknowledge the no-drop call. AWADS/SKE flight and element leaders, if able, will continue to provide signals for wingmen as long as the no-drop situation does not affect the wingmen or formation.

19.13.2. In IMC, a “no drop” will be signaled via the FCI and over interplane, if tactically sound. ***NOTE:*** Checklist may still be in progress after the “one minute advisory”. A no-drop will be called if the slowdown checklist is not complete prior to the “five-second” call.

19.14. Drop Zone Communications. See AFI 13-217 and AFTTP 3-3.25 for DZ communication procedures.

19.15. Methods of Aerial Delivery. The following are approved methods of aerial delivery:

19.15.1. Visual Airdrops.

19.15.2. Ground Marked Release System (GMRS). ***NOTE:*** The user assumes responsibility for airdrop accuracy during GMRS drops.

19.15.3. Verbally Initiated Release System (VIRS). ***NOTE:*** The ground party accepts responsibility for drop accuracy.

19.15.4. Jumpmaster Directed (JMD) Personnel Release Procedures.

19.15.4.1. Jumpmaster directed drops are limited to single ship airdrop operations only. These drops may be performed by qualified AF or sister service jumpmasters (or trainees under supervision of qualified personnel). Units will receive approval notice through the mission tasking directive from 618 TACC/XOOMJ for AMC-directed missions or from the appropriate theater command and control agency, annotated on JA/ATT Form 612R, tasking order, etc. The following conditions apply:

19.15.4.1.1. The jumpmaster’s parent service/user accepts all responsibility for the accuracy of the drop, plus any potential injuries/damage to equipment.

19.15.4.1.2. Specific in-flight visual signals, verbal signals, and interphone procedures between the jumpmaster, loadmaster, and PIC will be coordinated during the pilot, loadmaster and jumpmaster briefing.

19.15.4.1.3. Navigators will still accomplish CARP or high altitude release point (HARP) calculations to back up the computations and in-flight directions given by the jumpmaster.

19.15.4.1.4. Navigators will update the jumpmaster in-flight on actual wind information and any changes to the crew’s preflight computed CARP location.

19.15.4.1.5. JMD releases will not be mixed with any other type of airdrop method, i.e., GMRS, VIRS, or standard CARP drops. If JMD drop procedures are called for, the crew will follow the jumpmaster’s instructions, while adhering to normal safety

concerns. Should the crew believe the drop will occur outside of safe parameters, they will call "no drop" and ensure the red light is illuminated.

19.15.4.1.6. DELETED

19.15.4.1.7. DELETED

19.15.5. AWADS Airdrops. AWADS-equipped units are authorized to make airdrops using AWADS equipment in VMC or IMC.

19.15.6. Radar Beacon Airdrops. Radar beacon drops in IMC during peacetime must be approved by MAJCOM/A3/DO for active duty units and either HQ AFRC/A3 or ANG/A3 for AFRC/ANG units. The AOC/ALCC may approve IMC radar beacon airdrops for exercises or for contingency and combat operations.

19.15.7. Improved Container Delivery System (ICDS)/Joint Precision Air Drop System (JPADS).

19.15.7.1. ICDS and JPADS operations are conducted using the GPS-retransmission link and Precision Air Drop System (PADS) mission planner (MP) laptop and software. ICDS are normally rigged CDS loads with non-steerable chutes; JPADS operations are conducted using steerable chutes with automatic guidance units.

19.15.7.2. Collateral Damage Assessment (CDA). Units must perform a full collateral damage assessment prior to JPADS/ I-CDS airdrops. The CDA must be coordinated and approved by the area controlling agency. Coordinate with the owning agency of the restricted airspace or controlled airspace and landowners with property surrounding the DZ for all JPADS/I-CDS operations. Examine the area in the vicinity of the DZ for potential damage or hazards in the course of normal operations or during extraordinary system failure events. If the CDA demonstrates potential damage or hazards restrict airdrop release (LAR), lower the drop altitude, change the run-in, change parachute type or cancel operations. Inform the controlling unit of the risk to their operations; the controlling unit, and the JFC designated agency are approving authorities for risk to the area surrounding the DZ. Intelligence personnel are responsible for providing the JFC-designated agency close-up and overview imagery to facilitate CDA. Training units are highly encouraged to contact AMC/A3DT (2-3 weeks prior) in order to ensure all planning, coordination and reviews/assessments have been accomplished. Operations conducted at Yuma Proving Ground under JPADS related test plan do not need AMC/A3DT review. See AFI 13-217 for further information. The CDA must include, at a minimum, a review of the airspace and ground space with respect to: CARP and LAR location, 63% 1-sigma I-CDS success ellipse, Chute failure footprint and Guidance failure footprint.

19.15.7.3. The PO or mission planner is required to provide JPADS-MP derived CARP(S) for each airdrop pass and a completed CDA prior to an airdrop mission. Both pilots will review preflight CARP(S)/CDA for each respective airdrop. Use the approved checklist for dropsonde and ICDS/JPADS airdrops. During the cargo door dropsonde release, use of zero flaps at speeds between 170 – 180 KIAS is required to preclude dropsonde tail strikes. Loadmasters will open the cargo door for the dropsonde airdrops. Loadmasters will release the dropsondes from the corners of the cargo ramp, which will

be in the fully closed position. Upon hearing and seeing "GREEN LIGHT", lightly toss the sondes at a 45-degree angle away from the corner of the ramp.

NOTE: Do not exceed 185 KIAS with the cargo door open.

19.15.7.4. Intermediate gates made of ½-inch tubular nylon or greater will be rigged on all JPADS-equipped bundles. All aft restraint requirements will be met utilizing normal Type XXVI restraint. Intermediate gates will not be considered when computing aft restraint requirements. Cut the Type XXVI release gate/intermediate release gates IAW paragraphs **19.29.3** or **19.29.3.1**

19.15.7.4.1. For single-stick JPADS multi-bundle drops, all intermediate gates will be manually cut by the loadmaster. Double-stick JPADS operations require installation of ½ inch tubular nylon intermediate gates to ensure bundle separation. All bundles will be released sequentially to ensure 3 second separation between each bundle.

19.15.7.5. JPADS certified aircrews are authorized to airdrop above 3,000 feel AGL without the use of radar beacon, GRADS, or AWADS when using JPADS procedures and equipment.

19.15.7.5.1. For I-CDS operations, GPS Figure of Merit (FOM) 3 (including single GPS/INS equipped aircraft) or verification of waypoints by AWADS offset aimpoints is required. For JPADS operations, GPS FOM 3 (including single GPS/INS equipped aircraft) is required from the 1 minute warning until 'Green Light'.

19.15.7.5.2. Wind Limits. Wind limitations are unrestricted for dropsonde operations, 18 knots for Firefly, Screamer and Dragonfly and as published in AFI 13-217 for all other parachutes.

19.15.7.5.3. Drop Zone Size. Drop zone size criteria for JPADS and ICDS drops during contingency operations is at the discretion of the user. AFI 13-217 drop zone size restrictions apply during training.

19.15.7.5.4. JPADS Guided Footprint Locations. During normal training operations a JPADS DZ, CARP, chute failure footprint and guidance failure footprint will be located within a restricted airspace. If winds force the CARP outside of restricted airspace additional coordination with ATC is required prior to airdrop operations. This includes coordination with the ATC agency, filing a NOTAM, and ensuring airspace is clear for the entire guided system's flight profile from the drop altitude to the ground.

19.15.7.5.5. During normal training operations the entire 1-sigma (63%) I-CDS success footprint will be located within the surveyed DZ boundaries. The chute failure footprint must fall within restricted airspace. If outside of a restricted airspace the chute failure must fall on the surveyed DZ. If operating in a restricted area and winds force the CARP outside of restricted airspace coordination with Air Traffic Control (ATC) is required prior to airdrop operations. This includes coordination with the ATC agency, filing a Notices to Airmen (NOTAM) and ensuring airspace is clear from the drop altitude to the ground.

19.15.7.6. IMC/VMC day/night drops are authorized for contingency operations. CONUS training operations are required to comply with FAR 105 restrictions. Drops conducted thru or originating from IMC are only authorized from within or above an active restricted area. Before conducting IMC drops, check with the controlling agency for additional local restrictions. JPADS parachutes will not be dropped thru severe turbulence or severe icing.

19.15.7.7. Aircrew Procedure. After the JPADS-MP produces a CARP it is entered into the Self Contained Navigation System (SCNS). The pilot not flying and PO will verify the CARP and all airdrop parameters are entered correctly into the navigation system. For verification, the PO will read the JPADS-MP computed release point coordinates directly from the JPADS-MP while the pilot not flying verifies the same information is in the aircraft navigation system.

19.15.7.8. Jettison of JPADS AGU with MILGPS. Instances of jettison, unauthorized access, tampering, theft, or loss of the JPADS MILGPS enclosure must be reported to the GPS Controlling Authority (CA). Each such report shall include the JPADS MILGPS serial number and SAASM GPS serial number of the missing item and must state whether the system was keyed or unkeyed. Product Manager Force Sustainment Systems (PM FSS) will relay such jettison to the GPS CA. **NOTE:** Time permitting; the LM with concurrence from the PO will remove the MILGPS enclosure from the AGU prior to load jettison.

19.15.7.9. JPADS AGU MILGPS Procedure. For training missions with Air Force JPADS AGUs aircrew will check out the MILGPS from the tactics office. Upon mission completion and prior to removing the MILGPS enclosure, power up the AGU and accomplish the Recovery Mission Duration Zeroization (RMDZ) function (if desired). Zeroize prior to removal by pushing, for three seconds, the zeroize button located on the front panel of the MILGPS enclosure. **NOTE:** Keying and unkeying requires the MILGPS to be installed in a powered ON AGU. The AGU LCD screen should update within 20 seconds and should read MILGPS Keyed or Unkeyed. Once complete power OFF the AGU. The PO will remove and return the enclosure to the Unit's Tactics Office.

19.16. High Altitude Airdrop Oxygen Requirements.

19.16.1. A continuous supply of 100 percent oxygen will be used by all personnel during unpressurized operations above 10,000 feet MSL. Crewmembers will follow established MAJCOM oxygen mask requirements.

19.16.1.1. **EXCEPTIONS:**

19.16.1.1.1. Students of the Military Free Fall School, Parachutist Course (MFFPC) and Military Free Fall Jumpmaster Course (MFFJM), may perform unpressurized operations between the altitudes of 10,000 feet MSL and 13,000 feet MSL without supplemental oxygen, for a period not to exceed 2 hours, with the following safety measures in place:

19.16.1.1.2. For MFF-PC Students: A suitably qualified USAF Physiology Technician (PT) will be onboard and positioned in the aft portion of the cargo compartment when aircraft is between 10,000-13,000 feet MSL for longer than 30 minutes. Unpressurized flights between these altitudes will not exceed 2 hours. The

USAF PT will remain on 100% oxygen (or an appropriate air mix) throughout the unpressurized portion of the flight above 10,000 feet MSL. Under circumstances where a USAF PT is unavailable, a US Army 18 Delta Medic or USAF Pararescue trained and certified by HQ ACC/SGOP may be used. The role of the PT will be to monitor parachutists for signs of impairment resulting from hypoxia. If hypoxic impairment is suspected, the parachutist will be returned to the forward portion of the cargo compartment and administered 100% oxygen. Once symptoms and signs of hypoxia have been resolved, the parachutist may continue training. Instructors and jumpmasters will have 100% oxygen available (provided by the user) and will breathe from this supply whenever practicable.

19.16.1.1.3. For MFF-JM Students: There is no requirement for a USAF PT to be onboard for unpressurized operations between 10,000 and 13,000 feet MSL. However, the parachutists will breathe 100% oxygen for a period of at least 3 minutes, immediately prior to jumping if their time between 10,000 and 13,000 feet MSL exceeds 30 minutes. Supplemental oxygen will be supplied by an oxygen console provided by the Military Free Fall School.

19.16.1.2. All other parachutists may operate without supplemental oxygen during unpressurized flights up to 13,000 feet MSL provided the time above 10,000 feet MSL does not exceed 30 minutes each sortie. Jumpmasters may operate without supplemental oxygen for an additional 60 minutes within the 10,000-13,000 foot MSL envelope provided their duties do not include jumping. For unpressurized flight above 13,000 feet MSL, or exceeding the 30-minute envelope between 10,000 and 13,000 feet MSL, the use of an individual mask and regulator is required for all jumpers. The user is responsible for all supplemental oxygen requirements. Aircraft equipment will not be used by the parachutists.

19.16.2. When dropping from 18,000 feet MSL or higher, use pre-breathing procedures. When the aircraft oxygen system does not provide sufficient oxygen regulators for all personnel, approved portable oxygen console(s) will be pre-flighted and installed in the aircraft. The console(s) will provide enough oxygen regulators for all parachutists and crewmembers not accommodated by the normal aircraft system.

19.16.3. All airdrops above 25,000 feet MSL require a waiver to AFI 11-202V3 for unpressurized flight, from HQ AFFSA/XO, 1535 Command Drive, Suite D305, Andrews AFB MD, 20331-7002 through MAJCOM/Stan/Eval. MA-1 portable oxygen units (with serviceable web carrying straps) equipped with A-21 regulators will be provided for each person aboard the aircraft except parachutists. ***WARNING:*** No personnel will be exposed to unpressurized flight at or above 30,000 feet MSL more than three times each 7 days; in addition, they must have a minimum of 24 hours between exposures.

19.16.4. Pre-breathing requirements. All personnel will pre-breathe 100 percent oxygen below 10,000 feet pressure altitude or cabin altitude on any mission scheduled for a drop at or above 18,000 feet MSL for times shown in **Table 19.2** Pre-breathing will be completed before cabin altitude ascends through 10,000 feet MSL. All personnel will remain on 100 percent oxygen until cabin altitude is below 10,000 feet. A break in pre-breathing requires the pre-breathing period to be restarted, or the airdrop will be restricted to below 10,000 feet MSL. When pre-breathing on the ground is required, a launch crew may assist the primary

crew as needed to assure pre-breathing requirements are met. Pre-breathing will be conducted with a personally fitted oxygen mask attached to a helmet or approved adjustable head harness. Portable oxygen bottles may not be used for pre-breathing. ***NOTE:*** Quick don masks are emergency equipment and are not approved for pre-breathing or high-altitude operations (at or above 18,000 feet MSL).

Table 19.2. Prebreathing Requirements and Exposure Limits for High Altitude Operations.

Prebreathing Times				
Altitude	**Aircrews**	**Jumpers**	***Maximum Exposure Time Per Sortie Maximum Sorties Per 24-Hour Period**	**Maximum Sorties Per 24-Hour Period**
From FL 180 to FL 249	30 Min	30 Min	2 Hours	1
From FL 250 to FL 299	45 Min	30 Min HALO 45 Min HAHO	1 Hour	1
From FL 300 to FL 349	60 Min	60 Min	30 Min	1
FL 350 or above	75 Min	75 Min	30 Min	1

NOTE: Maximum Exposure Time Per Sortie is considered to be any time cabin altitude exceeds 10,000 feet MSL. Personnel will conduct no more than two oxygen jumps per 24-hour period that do not require pre-breathing (between 13,000 feet and 18,000 feet MSL) one of which, in the same 24 hour period, that requires pre-breathing (18,000 feet MSL or above). (***Example:*** Scenario 1: 2x 17,500 feet MSL or Scenario 2: 1 x 24,999 feet MSL and 1 x 17,500 feet MSL).

19.16.5. The jumpmaster may dictate the use of supplemental oxygen by any or all jumpers at altitudes less than those listed. Parachutists transfer from the aircraft oxygen system or portable oxygen console to a personal oxygen system at approximately one minute before green light.

19.16.6. Pressurization Scheduling. Maintain cabin pressure at or below 10,000 feet until the pre-slowdown checklist (time for check may have to be adjusted) and until pre-breathing is complete. Depressurization will not exceed 3,000 feet per minute. Slower rates are recommended if time allows. Ensure zero pressure differential before opening doors.

19.17. High Altitude Airdrop Loadmaster Requirements. Loadmaster requirements will be based on the following criteria:

19.17.1. Two loadmasters will be used on actual drops utilizing the ramp and door.

19.17.2. Two loadmasters will be used on all HALO personnel drops (13,000 feet MSL and above).

19.17.3. One loadmaster may be used on HALO personnel drops (up to 13,000 feet MSL) when utilizing the ramp and door or, only one paratroop door is opened.

19.18. High Altitude Operational Requirements for Physiology Technicians. PTs will support high altitude airdrop missions IAW AFI 11-409. At least 1 USAF PT is required per 16 personnel on the aircraft, up to a maximum of 3 PTs, for all airdrops conducted at or above 18,000 feet MSL. All CONUS requests for PT support must be made to USAF HAMS current operations desk (DSN 779-6303 / Commercial 618-229-6303). PACAF requests must be made to Kadena AB, JA (DSN 315-634-1967).

NOTE: The USAF High Altitude Airdrop Mission Support Program Manager, 203 West Losey Street, Building 1700, Suite 1600, Scott AFB IL 62225 may authorize variations to the PT-to-personnel ratio.

19.19. High Altitude Airdrop PT Duties.

19.19.1. PTs will fly as crewmembers as stated on aeronautical orders. When missions require a PT, the PT will be on interphone at all times. PT flight duty stations will be as required to monitor crewmembers, jumpers, and oxygen equipment. PTs will:

19.19.1.1. Preflight aircraft supplemental oxygen equipment.

19.19.1.2. Advise and aid loadmasters in positioning and securing oxygen equipment.

19.19.1.3. Brief crew and jumpers prior to the first mission on physiological problems that may be encountered, the importance of proper pre-breathing, and any special requirements.

19.19.1.4. Advise the PIC, crew, jumpers, and other personnel on use of oxygen equipment and on the depressurization schedule.

19.19.1.5. Monitor personnel, aircraft and supplemental oxygen equipment, and life support equipment.

19.19.2. The aircrew or the mission PT will notify HQ USAF/SGPA (DSN 858-4654), and HQ AMC/SGPA (DSN 576-2303) and appropriate Command Coordinator for Aerospace Physiology, of any physiological incident by the most expedient manner.

19.20. High Altitude Airdrop Conduct of Operations.

19.20.1. For communications and signals, interphone and hand signals are the primary methods of communications. Written messages may be necessary in some instances to communicate with individuals not connected to the aircraft interphone. Loadmasters will carry a suitable writing utensil and medium to write out messages that cannot be dealt with by using hand signals. When dropping parachutists, the jumpmaster may monitor interphone. The loadmaster will coordinate all hand signals with the jumpmaster.

19.20.2. Crewmembers will wear parachutes or restraining harnesses in the cargo compartment any time the doors are open during high altitude airdrop operations. Safety harnesses are worn on airdrops conducted above 14,000 feet MSL. (***EXCEPTION:*** PTs may wear a parachute on drops above 14,000 feet MSL but will not position themselves near an open exit.) LPUs must be worn with parachutes for operations over bodies of water with the doors open.

19.20.3. If an oxygen console is used, the loadmaster will be stationed aft of it to perform in-flight duties. The other loadmaster and physiology technician will be on interphone and

normally forward of the oxygen console, if used, to perform in-flight duties. This arrangement will provide a buddy system to check everyone on oxygen.

19.20.4. Maintain interphone contact between the cockpit and the cargo compartment. Both loadmasters must be on interphone from completion of pre-slowdown checks until execution of the completion of drop checklist and the cabin altitude is below 10,000 feet. The jumpmaster may also monitor interphone during high altitude personnel airdrops.

19.21. High Altitude Personnel Airdrop Procedures. ***CAUTION:*** Ensure any paratroopers remaining on-board de-arm their parachutes before cabin altitude descends below set parachute activation altitude.

19.21.1. Air deflectors must be operational if paratroop doors are used. If an air deflector does not extend, do not open the affected troop door.

NOTE: Jump platforms may be used.

WARNING: The aircraft ramp and door and paratroop door(s) will not be open at the same time.

19.21.2. When parachutists exit from the ramp, all parachutists, with the exception of the jumpmaster, will stand forward of the ramp hinge until the five-second advisory. One or both paratroop doors may be used in lieu of the cargo ramp. The ramp and door or paratroop door may remain open during racetracks if required, provided racetrack altitude is at or above a safe drop altitude and paratroopers are rigged for high altitude airdrops.

19.21.3. For jumpmaster-directed HALO drops, the green light may be turned on one minute prior to the release point. The navigator will provide a standard "green light" call at the jointly agreed upon release point. User assumes responsibility for drop accuracy.

19.21.4. Normally, the jumpers will exit the aircraft at their own discretion; however, their exit must occur during the green light time.

19.22. High Altitude Cargo Airdrop Procedures. Advancing technologies have enabled airdrops to be accomplished at much higher altitudes. Conduct high altitude cargo drops using AWADS, GRADS, ICDS/JPADS or radar beacon procedures. Heavy equipment airdrops above 10,000 feet MSL rigged with a single 28-foot extraction parachute or smaller will be rigged with the Extraction Parachute Jettison System (EPJS).

19.23. Personnel Airdrops.

19.23.1. In the event user personnel plan to jump with mixed parachute types, aircrews will always fly to and drop off the CARP for the main mass of paratroopers. The user assumes responsibility for the drop accuracy of individuals who choose to jump along with the main body of troopers while using a different type parachute. Aircrews will inform user jumpmasters if significant differences exist between CARPs.

19.23.2. Troop seats must have a serviceable retaining strap or be fitted with a pre-measured length of type III nylon cord to secure the seat in a raised position prior to slowdown. Ensure that parachutists have secured their seats, as required, and that no part of the seat protrudes into the aisle.

19.23.3. The loadmaster allows the jumpmaster access to the paratroop doors not later than the one minute advisory. (***EXCEPTION:*** The jumpmaster needs a minimum of two minutes in the door for jumpmaster directed drops.) The loadmaster then takes a position on the

cargo ramp to provide maximum maneuverability for jumpmasters and safety personnel to perform their duties.

WARNING: During personnel airdrops, the loadmasters will not position themselves directly under the center anchor cable supports (A-Frame, FS 737) in case of anchor cable or support mounting failure.

***NOTE*:** At no time will both paratroop doors be opened for paratroop drops if only one loadmaster is on board.

19.23.4. Upon seeing the red jump lights illuminate, the primary loadmaster will notify the jumpmaster or safety personnel of the red light condition. The loadmaster will count, if possible, any parachutists that exit while the red light is illuminated. ***WARNING:*** Do not attempt to physically stop or hinder jumpers from exiting the aircraft if jumpers continue to exit after "red light".

19.23.4.1. Control of the paratroop doors reverts back to the loadmaster after all parachutists have exited or remaining parachutists have been stopped by the jumpmaster or safety personnel and cleared from the paratroop door area. For racetracks, the loadmaster will retain control of the doors until completing the next slowdown checks.

19.23.4.1.1. Racetrack speeds and flap settings are flown as briefed. The paratroop door(s) may be left open with jump platform(s) extended during racetracks if all paratroopers aft of the aft edge of the wheel-well (FS 617) are hooked up to the anchor cables. Jumpers may stand and hook up to the anchor cable with paratroop doors open provided they are forward of FS 617. Other occupants of the cargo compartment must either be seated with a seat belt fastened, wear a restraint harness, or wear a parachute.

19.23.4.1.2. Avoid flying over water or built up areas while doors are open.

19.23.5. Static line retrieval:

19.23.5.1. The primary method of retrieval is using the static line retriever. The static line retriever will always be rigged and used for emergency retrieval of a towed parachutist. Manual static-line retrieval may be used to retrieve no more than ten static lines per door, per pass with one loadmaster, or 20 static lines per door, per pass with two people (combination of loadmasters, jumpmasters or safety personnel).

NOTE: Jump platform(s) may be left extended during manual retrieval of static lines. However, if the retriever winch is used, the jump platform must be retracted.

NOTE: When using the Towed Parachutist Retrieval System (TPRS), paratroop door static lines are normally retrieved using the retrieval sling assembly (choker). The retriever assist strap (RAS) is not required for normal retrieval of static lines. Although not required, the RAS may be used for proficiency or instructional purposes during normal static line retrieval.

19.23.6. During combat, cut static lines that cannot be retrieved. On other than combat missions, if the static line retriever fails during retrieval and more than 10/20 static lines are to be retrieved from a paratroop door, manually retrieve the static lines by using a 5,000 pound tiedown strap as follows:

19.23.6.1. Secure the hook end to a point forward enough in the cargo compartment to permit static lines to enter completely in to the aircraft.

19.23.6.2. Insert the other end of the strap under the static line from the bottom up, making a "U" around the static lines.

19.23.6.3. Pull the strap forward to retrieve the static lines into the aircraft. Loadmasters may require assistance to pull the strap forward.

19.23.7. If the static line retriever fails following a combination or tailgate drop, use the following procedure using the Prusik knot. See AFTTP 3-3.25 for Prusik knot techniques.

19.23.7.1. Take a 30-inch piece of 1/2-inch tubular nylon cord that is tied in a loop. Loop the cord around the static line retriever winch cable. Use a minimum of three wraps around the retriever cable to ensure locking of the 1/2-inch tubular nylon cord.

19.23.7.2. Pull to tighten the knot around the retriever winch cable to prevent slipping. Attach a carabiner into the 1/2-inch tubular nylon loop. Attach the hook end of a 5,000-pound strap into the carabiner and pull in the static lines. The 1/2-inch tubular nylon cord will remain locked in place under tension.

19.23.7.3. More than one 1/2-inch tubular nylon cord may be attached to the winch cable using the Prusik knot to facilitate static-line retrieval. The Prusik knot may be adjusted up or down the cable as required. The knot will not slip as long as it is wrapped tightly with a minimum of three turns (more wraps equal more friction) and tension is applied.

19.24. Tailgate Airdrop Procedures.

19.24.1. Tailgate drops are those drops during which parachutists exit from the aircraft ramp. The maximum rigged weight of the parachutist is 325 pounds. Tailgate drops are approved for STT, PJ, Air Force Survival Evasion Resistance Escape (SERE) Specialists, Army Special Forces, Navy SEALS, paratroopers equipped for arctic airdrop, other US and allied special operations personnel, US Army Quartermaster Center and School, Yuma Proving Ground Airborne Test Force, and units for which a combination drop is their normal method of deployment.

19.24.2. Rig both anchor cables and static line retrievers before takeoff to provide maximum mission flexibility. Mission commanders may approve rigging only one cable and static line retriever winch if circumstances dictate.

19.24.3. Use one anchor cable for each pass and limit each pass to a maximum of 20 parachutists. If more than one pass is required, alternate anchor cables, retrieving static lines and deployment bags prior to each additional pass to prevent entanglement. Static lines are retrieved using aft controls. ***NOTE:*** To ensure full utilization of the aircraft during training, over-the-ramp personnel airdrops may be made with center-aisle seats installed to approximately flight station 650 (aft of escape ladder). When more than 20 static line parachutists are to be dropped on a single pass, the paratroop doors will be used.

19.25. Combination Airdrops.

19.25.1. Combination drops are those during which parachutists exit from the aircraft ramp after equipment extraction or gravity release (CDS, Combat Rubber Raiding Craft (CRRC), Container Ramp Bundle etc.). ***NOTE:*** The M551 armored reconnaissance and airborne assault vehicle (ARAAV) and its crew may be airdropped as a combination drop provided the M551 is rigged on a type V airdrop platform. The M551 crew will hook their static lines to the right anchor cable.

19.25.2. Combination drops are restricted to single-ship or the last aircraft of an equipment formation. When tailgating parachutists, the drop altitude is determined by the item requiring the highest drop altitude per AFI 11-231. If an additional pass is required to drop all the personnel after a combination CDS drop, close the ramp and door and re-rig the static-line retriever cable as depicted in T.O. 1C-130A-9.

19.25.3. The navigator will compute a CDS or platform CARP and a personnel CARP (for ten seconds after the equipment release point) using the same indicated airspeed (IAS) and altitude used for the equipment. Inform the jumpmaster if the PI falls within 150 yards of the DZ boundary; the jumpmaster is the final approving authority in this situation.

19.26. Door Bundle Airdrops.

19.26.1. General A-7A or A-21 containers weighing up to 500 pounds (excluding the weight of the parachutes) are referred to as "door bundles" and are dropped from the aircraft through the paratroop door or ramp and door using the personnel airdrop checklist. Door bundles may be dropped independently or with personnel and are limited to one bundle per exit used. When dropped with personnel, the bundle is the first object to exit the aircraft. Remove restraints and position the bundle in the paratroop door or on the ramp prior to completion of the slowdown checklist. (***EXCEPTION:*** If the jumpmaster needs the paratroop door for spotting, place the door bundle as close as possible to the paratroop door.) If jumpers are to follow the door bundle, the user is responsible for ejecting the bundle out the troop door or off the ramp. For door bundles exiting over the ramp, secure the forward end of the bundle to a suitable floor tiedown ring with one-half inch tubular nylon. This tie is to prevent premature release of the bundle and will be cut by the loadmaster at the release point.

19.26.1.1. Door bundles dropped from the paratroop doors will be rigged with non-breakaway static lines. Their dimensions, including the parachute, must not exceed 48 inches by 30 inches by 66 inches unless authorized in a specific T.O. When the container is placed in the door for airdrop, the largest dimension will be placed in the vertical or upright position. The parachute must be placed on top of the load, or toward the inside of the aircraft.

19.26.1.2. Door bundles dropped from the ramp and door will be rigged with a T-10 parachute (converted for cargo) or parachute equipped with breakaway static lines (per TO 13C7-1-11). Also, bundles rigged for a ramp exit are equipped with a skid board compatible with the center roller conveyors. ***NOTE:*** If no parachutists are to be dropped after the door bundles, non-breakaway static lines will be used. Anchor cable stops will be positioned as depicted in TO 1C-130A-9 for CDS airdrops.

19.26.2. During unilateral single-ship airdrop training, door bundles will not exit aircraft after a paratrooper has jumped. ***NOTE:*** During joint training, combat or contingency operations, the user determines door bundle requirements and order of exit from any or all personnel airdrop aircraft in the formation.

19.26.3. When door bundles are dropped with personnel, compute the CARP for the first paratrooper exiting after the bundle and compute an additional CARP for the door bundle to ensure that it will impact on the DZ. Release the bundle at the personnel CARP, followed by the parachutists when the door is clear. When a door bundle is the only object dropped, base the CARP on the bundle.

19.27. Equipment Airdrops. Only equipment rigged in accordance with 13-C series T.O.s or JSOC 350 series may be airdropped. The maximum airdrop load to be extracted over the ramp is 42,000 pounds for C-130E/H airplanes 61-2358, 62-1784 and up and 25,000 pounds for other C-130 aircraft. The aerial delivery unit supporting the load movement ensures current publications are available for loadmaster reference during joint inspections.

19.28. Heavy Equipment airdrops with the Extraction Parachute Jettison System (EPJS).

19.28.1. Loadmasters must receive EPJS ground training before using the system during airdrop missions.

19.29. CDS Airdrops.

19.29.1. Reset flaps according to the appropriate CDS flap setting chart and maintain level flight. It is not recommended to drop CDS at gross weights less than 104,000 pounds. If drop must be made, use zero flaps and expect longer than normal exit time.

CAUTION: The aircraft will tend to pitch up as the load exits the aircraft. This pitch must be controlled to allow no more than two or three degrees additional pitch. Do not over control to the point that negative "G" forces are encountered while the load is exiting the aircraft as this increases exit time or may stop load movement.

CAUTION: Dropping high altitude CDS bundles at 17,000 feet or above requires proper yoke compensation for shift in center of gravity as the load exits. Premature yoke inputs, over compensation, or no yoke inputs all may result in aircraft tail impacts by exiting bundles.

19.29.2. When the loadmaster calls "load clear", the flaps should be set to 50 percent.

19.29.3. Loadmasters are permitted to pull down sharply with a gloved hand or on a tiedown strap looped over the static-line retriever winch cable to assist the cut of the release gate. Loadmasters will only pull on the cable after hearing and seeing "GREEN LIGHT".

19.29.3.1. A manual gate cut is defined as using a knife to cut/release the CDS/intermediate gates. Loadmasters will not cut release gates while in the paratroop doors next to the exiting bundles. Loadmasters will ensure they hear and see "GREEN LIGHT" before manually cutting the CDS/intermediate release gate. Loadmasters are allowed to go aft of the buffer stop/ alternate forward barrier to manually cut the release gate. Exercise caution to remain clear of exiting bundles. All single stick container loads (CVR and non-CVR) may be released using manual gate cut procedures. Double stick CDS released simultaneously will only be cut using the static-line retriever.

19.29.3.2. When performing a manual gate cut, enter "N/A" into blocks 3, 5, and 6 of the DD Forms 1748-1 Entry C "Type XXVI Nylon Release Gate." Annotate "Manual Gate Cut" into Block 17, Remarks.

19.29.4. Airdrops at or above 3,000 feet AGL will normally be conducted with high velocity parachutes. When necessary for operational missions, airdrops at or above 3,000 feet AGL may be accomplished with low-velocity parachutes with prior coordination through theater CAOC/AMD, and with concurrence of the user and aircraft commander. The user must understand accuracy utilizing low-velocity parachutes above 3,000 feet AGL will be diminished. User must accept responsibility for final bundle condition and the potential diminished accuracy of airdrop loads.

19.29.5. Loadmasters will ensure all CDS bundles (high or low-velocity) are rigged in the following static-line configurations:

19.29.5.1. Non-Breakaway: CDS loads dropped at 9,999 feet MSL or below will be rigged and airdropped with non-breakaway static lines.

EXCEPTION: LCADS parachutes will always be rigged for the breakaway regardless of altitude.

19.29.5.2. Breakaway: To minimize loadmaster workload while on oxygen and facilitate a rapid escape, CDS loads dropped at 10,000 feet MSL and above will be rigged and airdropped with breakaway static lines.

19.29.5.3. Release-away: JPADS 2K loads will be rigged and airdropped with release-away static lines regardless of planned drop altitude.

19.29.6. Release-away, breakaway, and non-breakaway static lines for CDS airdrops (contingency and training), will be rigged utilizing the oscillation dampening loop. Rig the oscillation dampening loop in the following manner:

19.29.6.1. Take an appropriate length of 80-pound cotton webbing and form a loop of one-turn single through the small clevis to a convenient location on the outboard side of the container webbing. Tie the loop to create slight tension in the 80-pound cotton webbing and secure with a surgeons knot and locking knot.

19.30. Combat Rubber Raiding Craft (CRRC) Airdrops.

19.30.1. Use the standard CDS checklist. Either two CRRC platforms and up to 18 static-line parachutists or one CRRC platform and up to 19 parachutists may be airdropped on one pass. Checklist and emergency procedures are the same as for CDS airdrops. Wind and sea state limitations are at the discretion of the supported unit. ***NOTE:*** When airdropping two CRRC platforms, the forward release gate must be cut manually by the loadmaster. When dropping one CRRC, either use the static line retriever or manually cut the release strap.

19.31. Free-Fall Airdrops. Use the normal CDS airdrop checklist and emergency procedures. Single containers not exceeding weight or dimension restrictions for door bundles may be dropped from either troop door using the personnel airdrop checklist.

19.32. High Velocity CDS Airdrops. Use normal CDS aircrew checklist procedures.

19.32.1. Units must establish a marking system to readily identify which 26-foot parachutes are packed for breakaway and non-breakaway static lines. The aircrew must ensure the CDS loads and the high-velocity parachutes are rigged and packed (marked) properly for the planned airdrop altitude (MSL). Aircrew procedures must be consistent with parachute packing.

19.32.1.1. Units must establish a marking system to readily identify which 26-foot parachutes are packed for breakaway and non-breakaway static lines. The aircrew must ensure the CDS loads and the high-velocity parachutes are rigged and packed (marked) properly for the planned airdrop altitude (MSL). Aircrew procedures must be consistent with parachute packing.

19.32.1.2. DELETED

19.32.1.3. DELETED

19.33. Container Ramp Bundles. The CDS Airdrop Checklist will be used with the exception of arming the CDS switch. CDS flap setting must be computed and used to ensure a positive deck angle for the drop.

19.33.1. Current items considered ramp bundles are: Zodiac F470U Boat in A-22 Cargo Bag, Advanced Rescue Craft (ARC) on a Combat Expendable Platform (CEP) rigged IAW FM 4.20.142/TO 13C7-51-21, and One or Two Motorcycles on a Combat Expandable Platform rigged IAW FM 10-577/TO 13C7-55-1. Ramp bundles will be loaded and rigged in the aircraft IAW Section 7-IIA of the aircraft TO 1C-130-9.*19.33.3.1. Ensure that no fuel is leaking from the RAMZ bundle. A leaking bundle will not be loaded aboard the aircraft or will be downloaded if already aboard. If one or more RAMZ with fuel are loaded aboard the aircraft the day prior to flight, the fumes may be decreased/eliminated by venting the aircraft overnight. Close both paratroop doors onto the extended jump platforms and secure them with tie down straps.

19.33.1.1. RAMZ containers are jumpmaster-directed ramp bundle drops regardless of the type parachute used by the STT team. The jumpmaster may use streamers and request additional passes to position the aircraft over the containers and STT release point. Containers are individually secured to the ramp with Type VIII nylon, which is manually cut by the loadmaster on the jumpmaster's command. The STT may exit immediately after container release or on a subsequent pass.

19.33.1.2. For jumpmaster-directed RAMZ airdrops, a navigator's CARP/HARP is not required when using streamers/spotter chutes.

19.33.1.3. For single-pass RAMZ airdrops, compute the CARP/HARP for the RAMZ by dividing the packages weight in two and applying this result to the ballistic data for a single, personnel T-10A/B parachute. If STT personnel jump on the same pass with the RAMZ, combination drop procedures apply.

19.33.2. Alternate Navigator Directed RAMZ Deployment.

19.33.2.1. Accomplish the slowdown using normal procedures.

19.33.2.2. Release point. The navigator determines the release point and assumes the responsibility to call "five seconds" and "green light." At green light, the loadmaster will manually cut the RAMZ bundle loose, which will signal the jumpers are clear to follow the gravity ejected load.

19.33.3. RAMZ Preflight. Prior to flight, the loadmaster will ensure the following items are accomplished:

19.33.3.1. Ensure that no fuel is leaking from the RAMZ bundle. A leaking bundle will not be loaded aboard the aircraft or will be downloaded if already aboard. Close both paratroop doors onto the extended jump platforms and secure them with tie down straps.

WARNING: If flammable fumes are present, unnecessary electrical equipment/switches will not be turned on or off until the fumes are eliminated. Use 100 percent oxygen and accomplish the Smoke and Fume Elimination checklist as appropriate.

WARNING: Only 15-foot static line will be used on the RAMZ cargo parachutes. A 12-foot static line extended to 15-feet will not be used. If personnel (rigged for static line airdrop) are to follow immediately after the RAMZ, their static lines will also be 15-feet.

NOTE: When loaded aboard the aircraft, the vertical restraint tiedown strap on the RAMZ will be secured in such a manner that it is not placed over any fuel bladder, and just tight enough to take the slack out of the strap.

19.33.4. RAMZ Deployment:

19.33.4.1. During the pre-slowdown checklist, vertical, aft and forward restraint straps will be removed from the RAMZ package. Gradually release the forward restraint to allow the package to slowly shift forward against the Type VIII nylon release strap. ***WARNING:*** Personnel must stand clear of the RAMZ package when removing the forward restraint.

19.33.4.2. At the "one minute" call, the jumpmaster will normally be on the left side of the cargo ramp and may be spotting from the aft end. Additional jumpers will be forward of the RAMZ. The loadmaster will be positioned to retrieve the RAMZ parachute static line D-bag(s) (for HALO airdrops) and to observe equipment and jumpers at all times. At the "one minute" call, the jumpmaster will be alerted and the Type VIII nylon release strap is rechecked. ***WARNING:*** If a "no drop" is called and the RAMZ is held in place by only the release strap, all personnel will move forward of the ramp hinge, except the loadmaster and the jumpmaster who will monitor the RAMZ for possible shifting and secure as necessary.

19.33.4.3. If the deployment is jumpmaster directed, the jumpmaster will determine the exit point and deploy prior to receiving a "no drop" notification or seeing the red light come on. The loadmaster will relay to the pilot all visual corrections given by the jumpmaster. The jumpmaster will signal for the loadmaster to cut the Type VIII nylon release strap.

19.33.4.4. If the deployment is PIC or navigator directed, the loadmaster will relay pertinent information to the jumpmaster. At the command "green light", the loadmaster will cut the Type VIII nylon release gate and deploy the RAMZ. If jumpers are tailgating, this will signal the jumpers that they are cleared to follow the load. If jumpers are freefall parachuting, they will exit after the loadmaster has retrieved the RAMZ parachute D-bags.

WARNING: If the RAMZ exits the aircraft, but fails to properly deploy, the static lines will be cut immediately.

CAUTION: The Type VIII nylon release strap must be cut below the knot to allow the nylon strap to pull free through floor tie down rings.

19.33.5. The RAMZ package will normally be delivered aligned into the wind (+/- 30 degrees) when the wind is 5 knots or greater. The jumpmaster will be advised when this cannot be complied with.

19.33.6. The minimum deployment altitude will be 3500 feet AGL when the STT exits using freefall parachutes. Higher altitudes may be used for training. For operational missions, minimum altitude with the freefall parachutes is 2500 feet AGL. If low ceilings prohibit the

use of freefall parachutes, the STT will deploy using static line parachutes immediately following the RAMZ package. The RAMZ and STT will be deployed from the same altitude. The minimum deployment altitude for both RAMZ and STT will be 800 feet AGL.

19.33.7. For training, one or more safety recovery boats will be in position to recover equipment and personnel as required.

19.34. SATBs. A 15-pound training bundle may be dropped to simulate personnel, equipment, or CDS airdrops. Use the applicable tactical airdrop checklist for the type airdrop being simulated. ***EXCEPTION:*** The loadmaster will use the equipment checklist for simulated CDS airdrops. SATBs may be dropped on the actual heavy equipment or CDS CARP for sight angle airdrop training provided the bundle will land on the DZ. Adjust the drop score for the difference between the SATB CARP and the actual CARP.

19.35. NVG Airdrop Procedures. Qualified NVG airdrop pilots are authorized to perform normal night operations (including low level flying and formation) at night VMC altitudes IAW the tactical chapters of this regulation and AFTTP 3-3.25. Airdrops may be accomplished on drop zones marked IAW AFI 13-217 lighting patterns (covert and overt) while wearing NVGs. NVG airdrops on unmarked DZ are prohibited unless permitted by contingency SPINs or coordinated through contingency ATO.

19.35.1. Loadmasters will use NVGs during airdrops if the mission dictates. Loadmasters are authorized to perform airdrops with minimum lighting. Use NVGs as necessary to assist with operations and keep cargo area lighting to a minimum.

19.35.2. Cargo Compartment Lighting. After the Combat Entry Checklist, all cargo compartment lighting will be minimized. Blacked out (no-light) operations in the cargo compartment are not authorized. Loadmasters will carefully consider cargo compartment lighting intensity prior to opening ramp and door to minimize interference with formation wingmen's NVG vision.

19.36. Emergency Procedures. Loadmasters will complete a detailed emergency procedure coordinated task briefing. All crewmembers should review the applicable emergency procedures for the airdrop to be performed before takeoff. If a malfunction occurs during an airdrop, the loadmaster immediately notifies the PIC and takes appropriate action. After all appropriate emergency actions are complete, run the completion of drop checklist. ***NOTE:*** In the event of a malfunction, incident, or off-DZ drop, do not de-rig, handle or move items unless required for safety of flight. Any follow-on investigation will benefit from seeing the items in the position or state they were in at the time of the event.

19.37. Emergency Parachutist Bail Out Procedures.

19.37.1. Under satisfactory conditions (static-line exit), the minimum acceptable emergency bailout altitude is 400 feet above the terrain. When an aircraft emergency occurs during static-line airdrops, the PIC maintains an acceptable attitude and altitude for the parachutists to evacuate the aircraft. If the jump must be made at an airspeed in excess of 150 KIAS, advise the parachutists of the airspeed and altitude. Order evacuation by turning on the green light and giving the briefed alarm bell signals.

19.37.2. Minimum emergency bail-out altitude for free-fall parachutists is 2,000 feet AGL.

19.37.3. If conditions are unsuitable for aircraft evacuation, turn the red light on until exit doors are closed. The PIC advises the jumpmaster through the loadmaster to have the parachutists unhook, take their seats, and fasten seatbelts.

19.38. Towed Parachutist.

19.38.1. The jumpmaster will stop the remaining parachutists; the loadmaster will notify the PIC; and the PM will turn on the red light. The PF will maintain drop airspeed, at least the minimum drop altitude (AGL) for the type parachute being used, and avoid flying over or up wind of water or built up areas.

19.38.1.1. Crews should suspect they have a towed parachutist if static lines are not fully tucked into the upper corner of the paratroop door or if a D-bag appears to be stuck outside the door. It is unlikely for a D-bag to become caught on the outside of the aircraft and is a probable indicator a parachutist is being towed. In any case, crews should follow emergency procedures until they have confirmed no parachutist is being towed. Crews should take special effort to confirm towed jumper status at night with limited rearward visibility. They should consider using an additional source of illumination to view the rear of the aircraft.

19.38.2. The jumpmaster or safety observer is responsible for identifying how the parachutist is towed. If being towed by anything other than the static line, the jumpmaster or safety will attempt to free the parachutist. If being towed by the static line, the jumpmaster or safety will make a recommendation to the PIC, through the loadmaster, whether to retrieve the parachutist or cut him or her free. If all parachutists have exited and there is no safety person onboard, this responsibility rests with the loadmaster.

19.38.3. The PIC will make the final decision whether or not to cut the towed parachutist free. If the decision is to cut the parachutist free, the loadmaster will cut the static line on the PIC's command. ***NOTE:*** Towed parachutists indicate consciousness and that reserve parachute is ready by maintaining a tight-body position with both hands on reserve parachute. This indicates the jumper is prepared to be cut away.

19.38.4. If the parachutist is towed after exit from a paratroop door, the pilot should lower the landing gear and set flaps to 100 percent to reduce parachute buffeting. (See warning below.) If possible, avoid turning the aircraft in the direction of the towed parachutist as this often causes parachutist to swing violently and increases the possibility of injury. All turns should be shallow and coordinated to reduce the severity of parachutist oscillation. During training, the first priority is to retrieve the parachutist whether he or she is conscious or unconscious. However, if the parachutist cannot be retrieved and indicates consciousness, cut the parachutist free. ***WARNING:*** Although 100 percent flaps selection provides an improved airflow for a towed parachutist, under certain conditions the landing gear down, 100 percent flap configuration may reduce aircraft performance. The PIC should consider density altitude, aircraft weight, position in formation, or other factors deemed important in determining what flap setting between 50 and 100 percent should be used.

19.38.5. For a parachutist towed after exit from the cargo ramp and door, the first priority is to cut the parachutist free if consciousness is indicated. Retrieve if the parachutist is unconscious, does not signal, cannot be observed, or if a condition exists that prevents

cutting the static line. ***NOTE:*** If the parachutist is towed following a ramp exit, it will be necessary to partially rewind the static-line retriever to reach the static line for cutting.

19.38.6. There are two methods for the retrieval of towed parachutists from the paratroop doors. The primary method of retrieval is use of the Towed Parachutist Retrieval System (TPRS). The secondary method of retrieval is to rig a 5,000-pound tiedown strap/paratroop retriever bar in the paratroop door prior to retrieval of the towed parachutist. When the secondary method must be used, the maximum rigged weight of the parachutist is limited to 250 pounds (including equipment, parachute, etc.) ***WARNING:*** The 5,000-pound tiedown strap/paratroop retriever bar shall not be used with the TPRS.

19.38.7. Parachutist Retrieval Through Paratroop Door Using TPRS.

19.38.7.1. Install the retrieval sling assembly (choker) around all static lines immediately below the static line snap hooks.

19.38.7.2. Install Retriever Assist Strap (RAS) around all static lines.

19.38.7.3. Fold in jump platform.

19.38.7.4. Using the static line retriever winch, retrieve the static lines through the RAS.

19.38.7.4.1. If the static line retriever winch has been modified with the slip clutch assembly, engage static line retriever winch until it slips. If the retriever clutch slips prior to bringing the parachutist into the paratroop door area, determine and remove the cause of the overload, slightly unwind the static line retriever winch to reset the slip clutch, and continue retrieval operation. ***WARNING:*** During retrieval attempts, take all possible action to ensure the parachutist does not slip back at any time. This does not preclude unwinding the retriever to reset the slip clutch, if necessary.

19.38.7.4.2. Stop retrieval when the cotton sleeve at the apex of the D-bags begin to pass through the RAS.

19.38.7.5. If in the paratroop door area, bring the parachutist into the aircraft by hand. If the parachutist is not in the paratroop door, i.e. positioned in the lower aft corner of the paratroop door, it is necessary to pull the D-bags manually through the RAS. Primary loadmaster maintains control of the static line retriever pistol grip. Secondary loadmaster and safety observer or jumpmaster (if safety observer or jumpmaster are onboard the aircraft) routes the D-bags through the RAS. Once the D-bags have been brought into the aircraft, manually pull them far enough forward so they will not interfere with the remaining retrieval. The primary loadmaster will continue retrieval. When pulled up to the door, bring the parachutist into the aircraft by hand.

WARNING: All personnel should remain clear of the paratroop door and the line of travel of the static line retriever cable until the parachutist has been retrieved to the door area.

NOTE: When the parachutist is in the door area and is under the control of the loadmaster or safety observer, or jumpmaster, slightly unwind the static line retriever to relieve tension on the line so the parachutist can be brought into the aircraft.

19.38.7.6. After retrieving the parachutist, the pilot will reset flaps to 50 percent, raise the landing gear (if required), and call for completion of drop checklist.

19.38.8. Parachutist Retrieval Through Paratroop Door Using 5,000-Pound Strap/Paratroop Retriever Bar.

19.38.8.1. Install a 5,000-pound tiedown strap across the paratroop door by threading the hook end of the strap behind the one inch tubular brace located at FS 737, across the door under all static lines, and behind the one inch tubular brace at FS 700. Secure the hook end of the tiedown strap to a floor/rail tiedown ring forward of FS 700 and the ratchet end to any convenient tiedown ring aft of FS 737. Remove as much slack as possible.

WARNING: Use extreme caution when routing 5,000-pound strap over the oxygen regulators located at FS 740 left and right side.

NOTE: The strap may be routed prior to the drop at FS 740 provided it is secured and does not interfere with the paratroop door operation or jumpers.

19.38.8.2. Push the static lines to the top of the paratroop door and remove additional slack in the tiedown strap. Fold the jump platform in.

19.38.8.3. If the airplane is equipped with a paratrooper retriever bar, install the bar as follows: The bar is inserted beneath all of the static lines extending out of the door, and one end is then raised and inserted in the retaining bracket in the aft portion of the door frame. The other end of the bar is then carefully raised and inserted in the forward portion of the door frame. The bar provides a smooth surface for the static lines to ride over as the paratrooper is retrieved back into the airplane.

19.38.8.4. Fold the jump platform in and initiate retrieval using the static-line retriever winch.

19.38.8.4.1. If the aircraft has been modified with the slip clutch assembly to the static-line retriever winch, engage static-line retriever until it slips. If the retriever clutch slips prior to bringing the parachutist into the paratroop door area, determine and remove the cause of the overload. Then, slightly unwind the retriever to reset the retriever's slip clutch, and continue retriever operation.

19.38.8.4.2. On aircraft not modified with slip clutch assemblies, stop retrieval when the cotton sleeve at the apex of the D-bags begins to pass over the 5,000-pound strap/paratroop retriever bar. ***WARNING:*** During retrieval attempts, take all possible action to ensure the parachutist does not slip back at any time. This does not preclude unwinding the retriever to reset the slip clutch, if necessary.

19.38.8.5. When the parachutist is in the paratroop door area, bring the parachutist into the aircraft by hand. If it is difficult to get the parachutist into the area of the paratroop door, i.e. positioned in the lower aft corner of the paratroop door, it will be necessary to pull the D-bags manually through the opening between the 5,000-pound strap/paratroop retriever bar and the paratroop door.

19.38.8.5.1. The loadmaster maintains control of the static line retriever pistol grip. The other loadmaster, safety observer or jumpmaster will route D-bags through the opening. Once D-bags have been brought into the aircraft, manually pull them far enough forward so they will not interfere with the remaining retrieval.

19.38.8.5.2. The loadmaster will continue retrieval. When pulled up to the door, bring the parachutist into the aircraft by hand.

WARNING: All personnel should remain clear of the paratroop door and line of travel of the static-line retriever cable until the parachutist has been retrieved to the door area.

NOTE: When the parachutist is in the door area and is being controlled by the loadmaster, safety observer or jumpmaster, slightly unwind the static-line retriever to relieve tension on the line so the parachutist may be brought into the aircraft. The jump platform may be extended once the parachutist is in the door area.

19.38.8.6. After retrieving the parachutist, the PM will reset flaps to 50 percent, raise the landing gear (if required) and call for the completion of drop checklist.

19.38.9. Parachutist Retrieval Through Ramp and Door. ***WARNING:*** The TPRS shall not be used during parachutist retrieval through ramp and door.

19.38.9.1. Thread the hook end of the 5,000-pound tiedown strap, front to rear, around the right/left vertical support member at FS 840 approximately 5-1/2 feet above the ramp in the ADS position. Attach the hook end into the strap and draw taut. Run the ratchet end of the strap across the ramp and thread it, front to rear, around the opposite vertical support member at FS 840. Remove all slack from the strap and attach the ratchet end to any convenient tiedown ring forward of FS 840. Ratchet the strap until taut. ***NOTE:*** For aircraft with tiedown rings installed at FS 847 (waterline 208), the 5,000-pound tiedown strap may be installed by attaching the hook end of the strap to the sidewall ring at FS 847 on the same side as the towed parachutist with the hook facing forward. Hook the ratchet end of the strap to the opposite sidewall ring at FS 847, remove all the slack from the strap, and ratchet the strap until taut. The strap will be pre-measured prior to pre-slowdown and excess strap taped.

19.38.9.2. Using the static-line retriever, retrieve the static lines over the strap and as the parachutist is pulled up to the ramp, bring the parachutist into the aircraft by hand underneath the strap.

WARNING: The last 5 feet are the most crucial for the towed parachutist. An oscillating parachutist usually strikes the aircraft head first. If the parachutist is oscillating violently, stop the retrieval momentarily to allow stabilization, then continue with retrieval. Repeat these steps as required.

NOTE: After the parachutist is pulled up to the ramp and is being controlled by the jumpmaster, safety observer or loadmaster, slightly unwind the static-line retriever to relieve tension on the line so the parachutist can be brought into the aircraft.

19.38.9.3. After retrieving the parachutist, run the completion of drop checklist. ***WARNING:*** There is no effective, dependable, or consistently reliable means to manually retrieve a towed parachutist from the paratroop door or ramp and door. Manually retrieving a parachutist is a last resort. Manual retrieval techniques vary, depending on the scenario, and should be used with extreme caution.

19.39. Equipment Emergency Procedures.

19.39.1. When notified of a malfunction, the PF will maintain drop airspeed and AGL altitude (if possible) and avoid flying over or upwind of water or built up areas to the maximum extent possible. The loadmaster will accomplish the malfunction checklist and notify the PIC when complete. The crew will then run the completion of drop checklist.

WARNING: Do not proceed aft of any platform or load until it is properly restrained. Preposition emergency aft restraint chains. Attach restraint to the items to which the extraction force is applied and remove all slack. Required restraint is per TO 1C-130A-9.

NOTE: Upon landing, ensure the load and airdrop system is not tampered with until after the malfunction is investigated by tactics/standardization and evaluation personnel.

19.39.2. Loose platform prior to green light. The loadmaster will take the following corrective actions:

19.39.2.1. Notify the PIC by stating, "Malfunction, loose platform".

19.39.2.2. Alert parachutists (if required) to remain forward/clear of the load.

19.39.2.3. Apply emergency restraint chains on all platforms to be dropped, moving from front to rear.

19.39.2.4. Raise the aft anchor cable supports, if required.

19.39.2.5. Clear the ramp and door to close.

19.39.2.6. Relock the platforms.

19.39.2.7. Secure the platform(s) with aircraft tiedown equipment if unable to engage the locks.

19.39.2.8. After completing the malfunction checklist, perform the completion of airdrop checklist. ***NOTE:*** Make no further attempt to airdrop the platform.

19.39.3. Extraction parachute fails to release mechanically/falls on the ramp, or the load failed to extract with a single extraction parachute outside of the aircraft. The loadmaster will:

19.39.3.1. Extraction Parachute Jettison System – Activated (if installed).

19.39.3.2. Notify the PIC by stating, "Malfunction/Extraction Parachute Jettison" with a brief description of the problem.

19.39.3.3. Alert parachutists (if required) to remain forward/clear of the load.

19.39.3.4. Apply emergency aft restraint chains on all platforms moving from front to rear.

19.39.3.5. Cut the extraction line if the EPJS was not installed or if it fails to release the extraction line.

WARNING: Ensure the lifeline is attached and locked to a tiedown ring or unused anchor cable with stop positioned no further aft than FS 677 prior to proceeding aft to cut the extraction line.

WARNING: Exercise extreme caution when manually cutting the extraction line. Platforms could dislodge from restraint chains, or a malfunctioning EPJS could suddenly initiate the squib and release the extraction line. In all cases, the extraction line will rapidly recoil after the cut.

19.39.3.6. Raise aft anchor cable supports, if required.

19.39.3.7. Clear the ramp and door to close.

19.39.3.8. Relock the platforms.

19.39.3.9. Secure the platform(s) with aircraft tiedown equipment if unable to engage the locks.

19.39.3.10. After completing the malfunction checklist, perform the completion of airdrop checklist.

WARNING: The combined effects of aircraft gross weight, drop altitude, and temperature may prevent level flight at drop speed when towing deployed extraction parachutes as small as 22 feet. Total drag on the aircraft may be more than the thrust available to overcome it. The situation could require an immediate forced landing near the DZ.

NOTE: Make no further attempt to airdrop the platform.

19.39.4. DELETED.

19.39.4.1. DELETED.

19.39.4.2. DELETED.

19.39.4.3. DELETED.

19.39.4.4. DELETED.

19.39.4.5. DELETED.

19.39.4.6. DELETED.

19.39.4.7. DELETED.

19.39.4.8. DELETED.

19.39.4.9. DELETED.

19.39.4.10. DELETED.

19.39.5. Multiple 28 foot extraction parachutes fail to release mechanically/fall on the ramp. The loadmaster will:

19.39.5.1. Notify the PIC by stating, “Malfunction,” with a brief description of the problem.

19.39.5.2. Alert parachutists (if required) to remain forward/clear of the load.

19.39.5.3. Raise aft anchor cable supports, if required.

19.39.5.4. Clear the ramp and door to close.

19.39.5.5. Relock the platforms.

19.39.5.6. Secure the platform(s) with aircraft tiedown equipment if unable to engage the locks.

19.39.5.7. After completing the malfunction checklist, perform the completion of airdrop checklist. ***NOTE:*** Make no further attempt to airdrop the platform.

19.39.6. Load fails to extract with multiple 28-foot extraction parachutes outside the aircraft. The loadmaster will:

19.39.6.1. Ensure the right rail control handle is in the emergency position.

19.39.6.2. Notify the PIC by stating, "Malfunction, load failed to extract" (if the load still fails to extract).

19.39.6.3. Alert parachutists (if required) to remain forward/clear of the load.

19.39.6.4. Pull the simul open control handle full forward. ***WARNING:*** The loadmaster must apply a sustained steady pull (10-20 seconds) on the simul open control handle to compensate for lock loading and binding caused by the towed parachutes.

19.39.6.5. Report the condition to the PIC if the load still fails to extract.

19.39.7. If the load cannot be jettisoned and flight conditions permit, proceed to a suitable airfield, avoid flying over built up areas and land in a flat attitude with ramp and door open. ***WARNING:*** With multiple 28-foot extraction parachutes deployed outside the aircraft, maximum thrust will be needed to stay aloft or to control the descent. The drag produced by the extraction parachutes should decrease if airspeed is allowed to bleed off. This reduction in drag could permit level flight or reduce the rate of descent should level flight not be possible. Do not reduce power to achieve this air speed change and do not slow below max effort takeoff speed. Max effort takeoff speed is 1.2 X power on stall speed and provides an acceptable airspeed margin for zero bank angle. If the aircraft must be turned to get to a suitable landing area, this airspeed may not be sufficient to prevent a stall while in banked flight. If a turn is required, pilots should be sensitive to the first indication of a stall and reduce bank and or lower nose to decrease angle of attack and eliminate the stall indication. Any power reduction will increase the stall speed. The tradeoff in selecting a landing site, straight ahead or one requiring a turn is a function of the rate of descent the required airspeed will produce. The higher the airspeed, the faster the aircraft will likely descend. A forced landing straight ahead will produce the lowest allowable airspeed, least rate of descent and most desirable impact forces. Any turn will decrease the time before impact. However, the risks associated with turning may be mitigated by the terrain the aircraft will impact such as forest or built up areas.

19.40. CDS Emergency Procedures.

19.40.1. Gate fails to cut/load fails to exit.

19.40.2. The loadmaster will take the following corrective actions:

19.40.2.1. De-arm the CDS switch (if installed).

19.40.2.2. Notify the PIC by stating, "Malfunction," with a brief description of the problem.

19.40.2.3. Alert parachutists (if required) to remain forward/clear of the load.

19.40.2.4. Raise the aft anchor cable supports (if required).

19.40.2.5. Clear the ramp and door to close.

WARNING: When notified of a malfunction, extend additional flaps and lower the nose to maintain a slight nose down attitude until the ramp and door are closed and the load is secured. Maintain drop airspeed and AGL altitude (if possible) and avoid flying over or upwind of water or built up areas.

WARNING: When dropping double stick using the CVR and one gate fails to cut, the loadmaster will delay notifying the PIC of a malfunction until the containers of the released stick have exited the aircraft. If the containers of both sticks fail to exit, notify the PIC immediately and continue with emergency procedures.

WARNING: When the cargo ramp and door cannot be closed from the cockpit, the loadmaster secures the load for aft movement. Ensure the lifeline is attached and locked to a tiedown ring or unused anchor cable with stop positioned no further aft than FS 677 prior to proceeding aft to cut the extraction line.

19.40.2.6. Secure the load for landing and install high altitude CDS safety pins (if required).

19.40.2.7. After completing the malfunction checklist, perform the completion of airdrop checklist.

EXCEPTION: If a malfunction is due to a failure of the static-line retriever or CDS remote timer system, the mission may be continued provided the 80 lb tie on the knife did not break, and the knife did not nick the gate. Use the opposite static line retriever and manually activate the retriever switch at FS 245 for three seconds or perform a manual gate cut. The DD 1748-2 is not required, but a write-up in the AFTO 781A is required.

19.41. CRRC Emergency Procedures. Follow either CDS or towed parachutist emergency procedures as required.

19.42. Container Ramp Bundle Emergency Procedures. Follow either CDS or towed parachutist emergency procedures as required.

19.43. Standard Airdrop Training Bundle Emergency Procedures.

19.43.1. SATB fails to release mechanically/falls on the ramp. The loadmaster will:

19.43.1.1. Notify the PIC by stating, “Malfunction,” with a brief description of the problem.

19.43.1.2. Clear the ramp and door to close.

19.43.1.3. After completing the malfunction checklist, perform the completion of airdrop checklist. ***NOTE:*** Make no attempt to remove the bundle from the ramp prior to closing the ramp and door. Do not attempt further SATB airdrops utilizing the bomb rack.

19.43.2. SATB outside the aircraft and fails to separate. The loadmaster will:

19.43.2.1. Notify the PIC by stating, “Malfunction,” with a brief description of the problem.

19.43.2.2. Cut the static line on the PIC’s command over the DZ. ***WARNING:*** When simulating an airdrop using the cargo ramp and door, a hung bundle could become wedged in the aircraft elevator during turns. Do not attempt to retrieve the SATB. If possible, cut the static line prior to making a turn.

19.43.2.3. Notify the PIC the bundle has been cut away.

19.43.2.4. After completing the malfunction checklist, perform the completion of airdrop checklist.

19.44. High Altitude Emergency Procedures. If a physiological incident occurs, the PIC will:

19.44.1. Abort the mission.

19.44.2. Begin descent (pressurization and descent will be determined by the type and degree of sickness or pain).

19.44.3. Ensure the affected person remains on 100 percent oxygen until a medical doctor determines the type of treatment required.

19.44.4. Proceed to the nearest base with qualified medical assistance available.

19.44.5. Advise the control tower of the emergency and request an ambulance meet the aircraft.

19.44.6. Advise attending physician to call Brooks AFB Hyperbaric Medicine DSN 240-3281/3278, commercial (210)536-3281/3278).

Chapter 20

AEROMEDICAL EVACUATION

20.1. Mission.

20.1.1. This chapter applies to Air Force C-130 Aircrews, Aeromedical Evacuation Aircrews and all management levels concerned with operations of the C-130 aircraft. All operators involved in Aeromedical Evacuation missions on C-130 aircraft will use this AFI.

20.1.2. C-130 aircraft may be used for AE transport of ill or injured DOD members and their dependents. These AE missions may be directed at any time by C2 agencies. AE personnel will utilize the procedures in applicable AFI 11-XXX and 41-XXX series, in conjunction with this publication, to accomplish the AE mission.

20.2. Operational Control and Reporting of Aeromedical Evacuation Forces.

20.2.1. HQ AMC is lead command for Aeromedical Evacuation. HQ AMC Directorate of Operations (AMC/A3) is the executive agent for operational AE missions.

20.2.2. Command and control of Aeromedical Evacuation missions is the same as other airlift missions.

20.2.3. The PIC is a qualified pilot responsible for command and control of all persons aboard the aircraft during an AE mission. In matters of flight safety, crew duty waivers, or operational considerations, his/her decisions are final (see AFI 11-2MDS-specific V3 for a more detailed list of PIC responsibilities). In matters of patient care, decisions of the MCD are final.

20.2.4. Medical Crew Director (MCD). The MCD is a qualified flight nurse responsible for the overall supervision of patient care and management of AECMs assigned to Aeromedical Evacuation missions. He/she advises the PIC on patients' conditions and the use of medical equipment that may affect aircraft operations. The MCD is directly responsible for the safety and medical well being of patients on the aircraft and coordinates enplaning and deplaning procedures with the AEOO and supporting agencies. In matters of patient care, the decisions of the MCD are final.

20.2.5. HQ AMC Command Surgeon (AMC/SG) is responsible for providing clinical standards and procedures concerning the treatment of patients in-flight.

20.2.6. The Aeromedical Evacuation Operations Officer (AEOO), if available, is a Medical Services Corps officer or a Medical Administration Specialist/Technician who acts as a liaison between the AE crew and ground support facilities. When available, the AEOO is responsible for coordinating the launch and recovery of the AE mission.

20.3. Alerting Procedures.

20.3.1. At all locations AMC C2 agency will alert the PIC who will alert the MCD. The MCD will alert the medical crew. The goal is to link the PIC, local AMC C2 agency and MCD before mission execution.

20.3.2. When the AE crew is staged separate from the front-end crew, the MCD will contact AMC local C2 agency and establish alert, showtime, etc. with the C2 agency. The MCD will

make every effort to communicate with the front-end crew any mission irregularities prior to crew rest. Utilize local AMC C2 agency to leave messages for non-emergency. Crew rest will be based on scheduled launch time. Do not violate crew rest.

20.3.3. The local AMC C2 agency will provide AC/MCD AE mission information when he/she checks on mission status. Local C2 agency will be the link between the AE crews and the PIC, thus permitting mission status updates to both parties without interruption of crew rest.

20.3.4. AE mission requirements can change depending on clinical status of patient(s) and aircraft availability. There will be occasions when aircraft cannot depart (i.e. MX problems) or emergency patient movement that may separate an AE crew from the front-end crew. The MCD is responsible for communicating these changes with the PIC and local AMC C2 agency to de-conflict problems.

20.4. Pilot in Command Responsibilities.

20.4.1. Establish communications link with the MCD during pre-mission planning and throughout the mission.

20.4.2. Brief AE crew on the mission, flight plan, flight profile, and current threat (as applicable).

20.4.3. The PIC will fully integrate front-end and Aeromedical Evacuation Crew Members (AECM) into single crew throughout mission including en route transportation, dining, billeting, etc.

20.4.4. Coordinate with MCD and C2 agencies for cabin altitude/flight restrictions based on patient requirements. When the sortie is being flight managed, coordinate flight restrictions with the FM if the FM provided plan needs to be modified.

20.4.5. For missions with combined cargo and patients, coordinate with the MCD for loading, positioning, egress considerations.

20.4.6. Comply with hazardous cargo/passenger restrictions in AFI 24-101.

20.4.7. Advise AECMs of intentions to start engines, taxi, itinerary changes, in-flight difficulties, and additional responsibilities of the flight crew.

20.4.8. Transmit load messages and radio transmissions to tasking AE C2 agency as requested by the MCD.

20.4.9. Brief the MCD on additional responsibilities of the flight crew.

20.5. Loadmaster Responsibilities.

20.5.1. Assist the AE crew with aircraft systems.

20.5.2. Coordinate emergency evacuation plan with the MCD.

20.5.3. Operate aircraft systems, i.e., doors, ramps, emergency exits, etc.

20.5.4. Assist the AE crew as necessary, providing such assistance does not interfere with primary duties.

20.5.5. Operate galley and prepare food and beverages for food service provided to patients by AECMs.

20.5.6. Assist with aircraft configuration for AE operations.

20.6. Aeromedical Evacuation Crew Responsibilities.

20.6.1. Responsible for patient clinical care activities including loading, positioning, and off-loading.

20.6.2. Assist Loadmaster/maintenance crew with aircraft configuration for AE operations.

20.6.3. Install and remove medical equipment/supplies.

20.6.4. Assist the Loadmaster with observation and care of passengers when it does not interfere with primary duties.

20.6.5. The MCD or designated AECM should be on aircraft inter-phone (headset) for all phases of flight, and will be on aircraft inter-phone during critical phases of flight to include take-off and landing.

20.7. Ground Operations.

20.7.1. Engines should be shut down during enplaning and deplaning of patients. **Exception:** ERO procedures as outlined in **20.14**

20.8. Refueling Operations.

20.8.1. Refueling normally begins after deplaning patients are off the aircraft and prior to enplaning that station's patients. The PIC and CSS shall ensure aircrew members and servicing personnel accomplish CS per AFI 32-2001 and TO 00-25-172.

20.8.2. Concurrent servicing may be accomplished with patients onboard provided:

20.8.2.1. The CSS coordinates with all personnel involved prior to beginning concurrent operations.

20.8.2.2. Prior to starting concurrent servicing, the total number of patients, passengers, and crew on board the aircraft will be given to the fire department.

20.8.2.3. Loading ramps/stairs are in place for immediate use and exits (excluding the overhead escape hatches) are opened for egress.

20.8.2.4. The aircraft is thoroughly ventilated.

20.8.2.5. At least two AECMs (one must be a FN) remain onboard to observe and assist patients in the event of an egress.

20.8.3. If cabin lights, lavatories, electrical power to operate medical equipment and aircraft inter-phone are operating prior to refueling, use may be continued during servicing operations. Only those systems, switches or electrical circuits needed to operate equipment to sustain life, may be turned on and used during refueling.

20.8.4. Patients and passengers will not enter or exit the aircraft during servicing. Crewmembers may enter or exit the aircraft only when performing essential duties associated with the concurrent servicing operation.

20.8.5. DELETED.

20.8.6. Activities around the aircraft will be kept to a minimum during the refueling process. On-load/off-load patient and passenger baggage prior to or after refueling.

20.8.7. Do not use the on board toilet facilities during servicing.

20.8.8. When the aircrew is at the aircraft, the PIC is responsible for all aspects of aircraft operations and shall inform the CSS how aircrew members will participate in passenger evacuation/safety.

20.9. Aircraft Configuration.

20.9.1. On designated ARM and operational AE missions, configure the aircraft during pre-flight per T.O. 1C-130A-9.

20.9.2. Litter Support Provisions.

20.9.2.1. Roller conveyers will be stowed, unless required for comfort/baggage pallets. Rollers on the ramp will be stowed during patient on-loading or off-loading operations.

20.9.2.2. Litter patients will be enplaned feet first and deplaned head first due to minimal degree of ramp incline. This eliminates the need to turn litter patients around on the cargo ramp prior to placing them in the litter tier.

20.9.2.3. A five (5) high configuration using the center seat and litter stanchions is approved for all AE missions.

20.9.2.4. The seat and litter stanchion ladder will be installed for all AE missions when cargo requirements permit.

20.9.2.5. Litter support straps will be secured to the aircraft floor prior to take-off. If litters are not in the tier, loose litter support straps will be secured in a top and bottom litter support bracket on the center seat and litter stanchion. This will remove a free-swinging strap hazard.

20.9.3. Available litter spaces and ambulatory seating will depend on the aircraft cabin's mission configuration.

20.9.4. Therapeutic Oxygen. Therapeutic oxygen is not an integral system on the C-130 aircraft. Use the PTLOX or MOST system.

20.9.5. Integral patient/passenger emergency oxygen is not available on the aircraft. In the event of an emergency, patients and passengers will use the Emergency Passenger Oxygen System (EPOS) or Protective Breathing Equipment (PBE).

20.9.6. AECMs will have portable oxygen available. AECMs normally use an MA-1 portable oxygen bottle, or equivalent. EPOS or PBEs can be used as an alternate oxygen source if the preplanned flight level is below FL350. ***NOTE***: If a pressure demand regulator is used, the oxygen supply will be turned "off" when the personal oxygen equipment is removed.

20.9.7. Do not secure aircraft or medical equipment adjacent to an emergency exit in a manner that will prevent or impede egress.

20.9.8. Life Preservers. Use the Adult/Child life preserver for patients.

20.10. Passengers and Cargo.

20.10.1. The PIC, with the concurrence of the MCD, will ensure maximum aircraft utilization for passengers and cargo. Passenger restrictions based upon patient considerations will be

identified when seats are released. The PIC will advise the appropriate C2 agency of the number seats available for passengers.

20.10.2. Cargo and passengers may be carried with patients unless a clear detriment to the health and well being of the patient or passengers can be demonstrated. The decision will be made by the MCD, considering the need for maximum utilization of the aircraft. Conflicts will be referred to the respective tasking AE command element for a decision. Litter patients will be positioned forward of cargo pallets. Exception: If cargo is in place, and the PIC and MCD agree, patients may be transported aft of the cargo. The MCD and Loadmaster will ensure patient egress is not affected by mixed cargo/patient loads.

20.10.3. Cargo will not be bumped except in unusual/abnormal cases, and only after the MCD has coordinated with the PIC and notified the tasking AE command element.

20.10.4. Do not move ambulatory patients to litters in order to provide seating for additional patients or passengers.

20.10.5. For patient comfort and to permit in-flight rest for patients use the following for missions over 4 hours in duration:

20.10.5.1. Minimum of 2 litters must be available for ambulatory patients.

20.10.5.2. One seat must be reserved for every 3 litter patients.

20.10.6. An emergency litter will be set up on all AE missions.

20.10.7. Patient Therapeutic Liquid Oxygen (PT LOX) may be transported for positioning and depositioning of operational/contingency support AE Missions.

20.10.8. A maximum of 25 PTLOX serviced units may be transported simultaneously without Hazmat certification. Processing through aerial port is not required. If shipping more than six PTLOX containers as cargo, do not cover with plastic. This will prevent potential high concentration of oxygen levels. ***WARNING*:** Ensure the cargo floor is free from any oil or petroleum products.

20.10.9. Hazardous cargo will not normally be transported aboard AE missions.

20.10.10. AE Movement of Contaminated/Contagious Personnel. Potentially contaminated patients must be decontaminated before entering the AE system. However, in extreme circumstances, the AMC/CC is the policy waiver authority for movement of contaminated/contagious casualties/personnel. If a waiver is approved, AMC will provide the capability to move a small number of contaminated/contagious casualties (a combination of approximately 50, with a maximum of 20 contagious personnel). AMC will equip AE crew operating in designated high-threat areas with the required equipment/supplies to carry out this mission. ***NOTE:*** If AECMs are utilizing the MCU-2A ground chemical mask, a FL below 10,000 feet is recommended due to reported valve failure during rapid decompression.

20.11. Crash/Fire/Rescue.

20.11.1. Aircraft carrying patient(s) will be provided CFR protection per T.O. 00-25-172. Stand-by CFR vehicle is not necessary during normal operations however, a CFR vehicle will be available upon request. The flight crew will coordinate CFR requirements.

20.11.2. At non-AMC bases, non-U.S. military bases, and civilian airfields, the controlling agency will coordinate the CFR coverage, as necessary. The request for CFR vehicle coverage may be denied. This will not prevent refueling operations from occurring.

20.12. AE Call Sign/Use of Priority Clearance.

20.12.1. AIREVAC Priority. The PIC may request "AIREVAC priority" for preferential ATC handling if a delay will affect a patient's well being. PICs will request priority handling if AE missions are experiencing long delays during takeoff or landing phases, that will affect a patient's condition.

20.13. Load Message.

20.13.1. The MCD will complete the AF Forms 3858, *C-130/C-141 Aeromedical Evacuation Mission Offload Message* and coordinate for transmission of patient information with the "30 minutes out call."

20.14. ERO Procedures.

20.14.1. ERO procedures are outlined in AFI 11-2AE Volume 3. ERO procedures for loading patients are authorized for contingency operations or when AE mission requirements dictate minimum ground time. ERO procedures can be practiced/trained during ARMs, joint training operations, exercises, etc. EROs will not be used in a noncontingency environment unless mission essential.

20.14.2. The loadmaster will be positioned on the left side, at the foot of the ramp and on headset during actual on-load procedures.

20.14.3. When litter patients are wearing personal gear (i.e. web belts, canteen, helmets, flak vests, etc.), consider loading four (4) high versus five (5) high in the center seat and litter stanchions, to increase space between litters to accommodate gear. If situation requires/permits, remove personal gear from patients and secure on ramp or in a designated area.

20.15. Floor Loading Procedures.

20.15.1. Floor loading of patients is authorized for all contingency operations when a time critical environment exists (i.e. non-secure landing zones, areas faced with enemy siege/hostile fire, humanitarian reasons, etc.), and minimum ground time is essential. Floor loading procedures can be practiced/trained during aeromedical readiness missions (ARMs), static trainers, joint training operations, exercises, etc. The cargo/ramp floor will be configured with all rollers stowed (cargo permitting). Maximum altitude for floor loaded patients is FL 350. Patients will have an EPOS pre-positioned on their litter when floor loaded.

20.15.1.1. Ambulatory Patients. If available, any cushioning material may be used for seating, to prevent the patient from having to sit on the cargo floor. Seat ambulatory patients so they face forward in the aircraft. Attach a cargo tie-down strap for each row of patients, in a manner that it will provide forward restraint and body stability. See T.O. 1C-130A-9 for proper use of the tie down device.

20.15.1.2. Litter Patients. Two crewmembers are required to work simultaneously in securing the opposite sides of the litters to the floor (applies when securing two or three

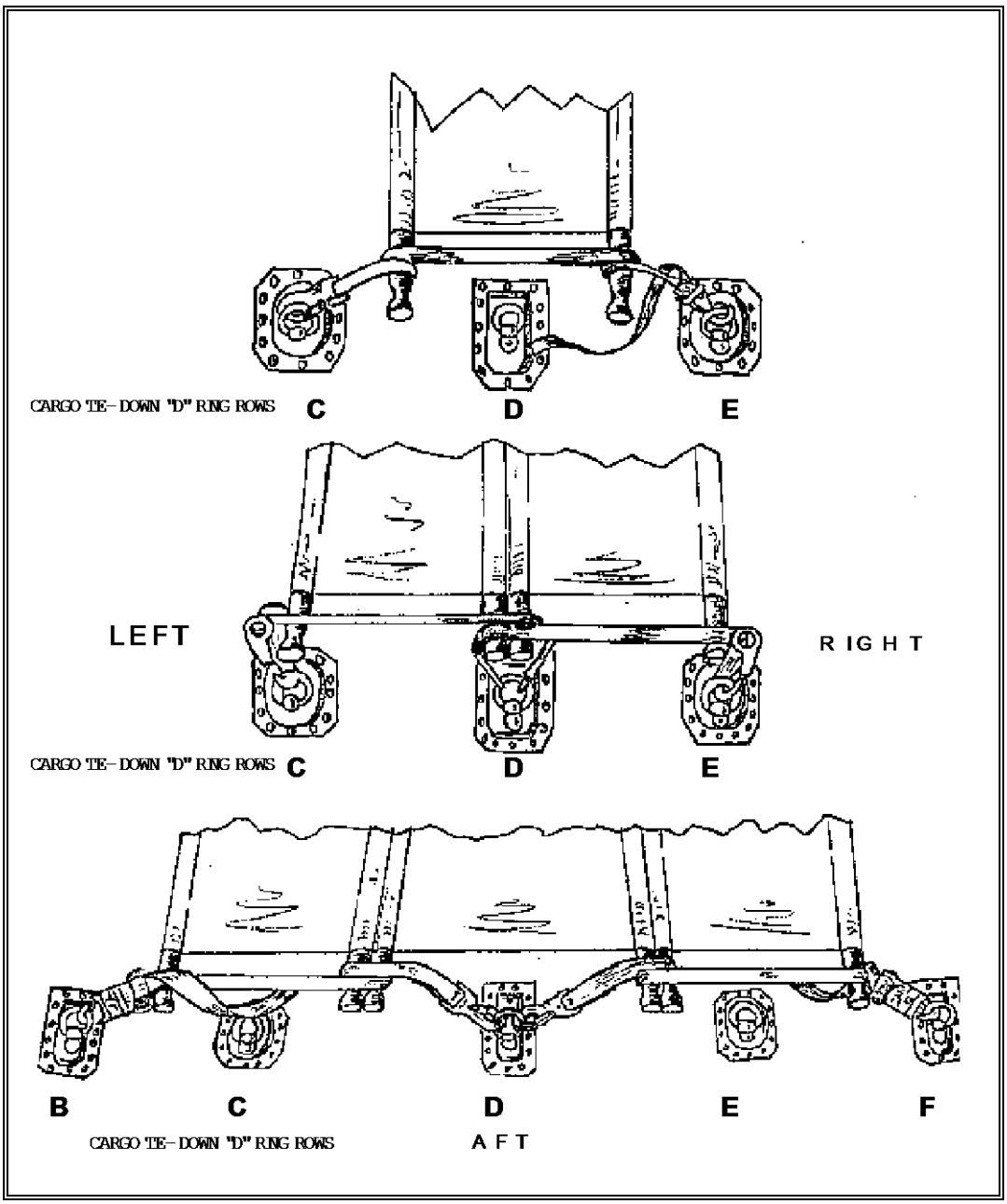
litters together). Position litters side-by-side and longitudinally on the cargo area floor, with the patient's head toward the aft of the aircraft. A maximum of 15 litters, comprised of five rows of three litters, can be floor loaded. Medical equipment can be secured on a litter(s) in the "I" or "L" sidewall litter tier or on the ramp. Secure the litters to the aircraft floor using the following procedures. (See **Figure 3.1**)

20.15.1.2.1. One litter: Center litter over "D" column. Use one tie-down device at each end of the litter. Connect clamp end of device to a tie-down ring in the "C" column, and run strap webbing over the litter handles, wrapping once around each handle. Attach the hook on the ratchet end of the tie-down device to the tie-down ring in the "E" column on the other side of the litter. Remove slack from strap webbing, and ratchet the tightening device (see T. O. 1C-130A-9 for proper use of the tie-down device). Repeat process at other end of litter. Ensure ratchets have 1½ turns.

20.15.1.2.2. Two litters: Place litters side-by-side, and align inboard litter handles over "D" column. Use two tie-down devices at each end of the litters. Connect clamp end of tie-down devices to tie-down ring in "D" column, and run strap webbing over both inboard handles, then over respective outboard handle. Do not wrap strap webbing around any handles. Attach the hook on the ratchet end of the tie-down devices to the tie-down ring in "C" or "E" column (as applicable). Remove slack from strap webbing, and ratchet the tightening device (see T.O.1C-130A-9 for proper use of the tie-down device). Repeat process at other end of litter. Ensure ratchets have 1½ turns.

20.15.1.2.3. Three litters: Place litters side-by-side and center inboard litter over "D" column. Use two tie-down devices at each end of the litters. Connect clamp end of tie-down devices to tie-down ring in "D" column, and wrap strap webbing once around applicable paired litter handles, then over respective outboard handle. Do not wrap strap webbing around outboard handles. Attach the hook on the ratchet end of the tie-down devices to the tie-down ring in "B" or "F" column (as applicable). Remove slack from strap webbing, and ratchet the tightening device (see T.O. 1C-130A-9 for proper use of the tie-down device). Repeat process at other end of litter. Ensure ratchets have 1½ turns. ***NOTE***: Due to forward pallet stop bumper locations, litter handles may have to be secured forward of the litter stanchions mounted at the forward bulkhead.

Figure 20.1. Floor Loading Litters



Chapter 21

EMERGENCY NUCLEAR AIRLIFT (ENAF)

21.1. General. The objective is to move nuclear weapons safely. You may be tasked at any time to airlift nuclear weapons. The amount of preparation time and degree of assistance you receive will depend on the length of time the MAJCOM has to move the weapons.

21.2. Conduct of Operations. Crews should be briefed and receive detailed instructions from a specific OPLAN or mission directive. If there is a conflict between this instruction and the requirements in an OPLAN or mission directive, use the OPLAN or mission directive.

21.3. Emergency Nuclear Airlift Standards. Crews are expected to use sound judgment and common sense in what may be a turbulent or tense environment. Pay particular attention to the following areas:

21.3.1. Nuclear weapons must be handled safely. The most immediate hazard is the high explosive that can be set off by shock or heat in most nuclear weapons. Keep loading operations controlled and orderly at all times. Load or handle only one item or pallet at a time. Crews may ask shipper or receiver personnel to help, but the overall aircraft loading responsibility still belongs to the aircrew.

21.3.2. Use specific loading procedures outlined in TO 1C-130-9, Section 6.

21.3.2.1. For mixed loads (more than one type of weapon), base the load plan on how many weapons can be properly restrained using TO 1C-130-9 criteria. Do not allow weapons to rub or touch each other when tied down.

21.3.3. DELETED.

21.3.4. The route of flight must not violate restrictions in the classified United States Air Force Special Weapons Over-flight Guide (SWOG). Over-flight of a foreign country with nuclear weapons is an extremely sensitive issue. Comply with SWOG instructions at all times. Crews without access to the SWOG, will request a route of flight that complies with the SWOG through command and control center (C2 agency) channels, TACC/XOOON, DSN 779-4584. The C2 agency must ensure the route of flight is provided to the aircrew by the most expeditious means available. If no route of flight is provided, fly normal ATC routings to the destination. Do not divulge the nature of cargo to any en route ATC facility or country to obtain a specific clearance.

21.3.5. United States military custody of nuclear weapons is required. Normally, the copilot is the courier who has custody of the nuclear cargo for the flight. Under certain conditions, the shipper may furnish United States military couriers who will retain custody of the weapons in flight.

21.4. Aircrew Selection. All active duty aircrews (except 374 AW) may be used for ENAF.

21.4.1. DELETED.

21.4.2. DELETED.

21.4.3. DELETED.

21.4.4. DELETED.

21.5. Aircrew Requirements.

21.5.1. Crew complement will be according to the OPLAN or specific mission directive. If not specified, use a normal crew complement.

21.5.2. The crew will be armed (courier and two additional crewmembers).

21.5.3. Crewmembers tasked for a mission that has a higher security classification than their personnel security clearance will be authorized emergency access to enough information to complete the mission. Approval authority rests with a general officer, wing commander, or wing commander equivalent and cannot be delegated.

21.6. Aircrew Briefings.

21.6.1. Crews should be briefed on the following:

21.6.1.1. Purpose of the mission.

21.6.1.2. Classification of the mission, cargo, and locations.

21.6.1.3. Itinerary, including confirmation of prior coordination for hazardous material as required by IFR supplement and alternate airfields.

21.6.1.4. Cargo. TO 11N-20-11 line numbers should be included. Obtain line numbers from the fire department prior to loading. TO 11N-20-11 is a classified technical order that assigns an unclassified line number to each nuclear weapon.

21.6.1.5. "No lone zone," two-person concept, and security requirements.

21.6.1.6. Personnel authorized to sign for nuclear weapons at the destination.

21.6.1.7. Current intelligence, including threat analysis.

21.6.1.8. SWOG route of flight restrictions.

21.6.1.9. Airborne intercept (SWOG).

21.6.1.10. Jettisoning (SWOG).

21.6.1.11. Command Disable System (CDS) procedures.

21.6.1.12. The PIC will ensure emergency procedures in **paragraph 21.10** below are briefed

21.6.1.13. ORM risks/levels/mitigating factors for the mission.

21.7. En Route Procedures. Use these procedures in addition to the normal operating procedures in the rest of this regulation.

21.7.1. Flight Plans. Enter "hazardous cargo" and the mission number in the "other information" section of the flight plan. Crews carrying inert weapons, trainers, or other items that could be mistaken for real weapons by crash or rescue personnel in an emergency will enter "inert devices."

21.7.2. Radio Calls:

21.7.2.1. Departure (on-load) base. Before starting the on-load, tell the tower to notify the fire department the "on-load is commencing." Prior to engine start, give the controlling agency (ground or tower) the parking location and approximate engine start time and announce there is hazardous cargo aboard the aircraft. Ensure a fire truck is standing by the aircraft for engine start.

21.7.2.2. En route or offload base. At least 30 minutes prior to landing, contact one of the following: command post, base operations, or control tower. Pass mission number and verify that the hazardous cargo information has been received. If the arrival base does not have hazardous cargo information, request the following be relayed immediately to the crash or fire protection agency and other support agencies as appropriate:

21.7.2.2.1. Aircraft call sign, type, and mission number.

21.7.2.2.2. ETA.

21.7.2.2.3. Department of Transportation (DOT) explosives hazard class or division (normally 1.1).

21.7.2.2.4. Net explosive weight (NEW).

21.7.2.2.5. Line numbers from TO 11N-20-11 if requested. Obtain line numbers from the base fire department prior to starting the load at the on-load location.

21.7.2.2.6. A request for isolated parking and security forces to meet the aircraft.

21.8. Custody of Nuclear Cargo. The courier must be a commissioned officer. A copilot or navigator is the preferred option. The courier officer is responsible for receipt, custody, security, safety, and delivery of nuclear weapons to authorized receivers.

21.8.1. Prior to accepting and loading nuclear weapons, the shipper briefs the crew (at least the PIC, courier officer, and primary LM) on the nature and hazards of the cargo. PICs will brief crewmembers who didn't receive the shipper's briefing prior to flight. Ask the shipper to point out any specifics crews may need to handle the weapon, i.e. tiedown points, forklift stirrups, CDS procedures, etc.

21.8.2. Time permitting, the courier and LM will inspect the cargo before accepting custody. The courier should have the shipper verify the integrity of a weapons case and replace any broken seals. Crews may be held responsible for damage at the receiving end if crews accept a damaged weapon without documentation. Document damage or broken seals on the DD 1911, **Materiel Courier Receipt**, prior to signing for the weapon.

21.8.2.1. Loadmasters will inspect weapons to ensure they are secured to carriers, conditions of tiedown rings, and condition of wheel casters etc.

21.8.3. The courier accepts custody of the weapon by signing the DD 1911 provided by the shipper. Use this form to transfer cargo custody to replacement couriers.

21.8.4. Release custody of the cargo only to a replacement courier or someone authorized to sign for nuclear material. Authorized receivers are identified by the shipper, by message, or through the AMC command and control system.

21.8.5. Time permitting, refer any questions through the 618 TACC Command Center to 618 TACC/XOOOD, DSN 779-4584 for resolution.

21.9. Security Procedures. The host base is responsible for providing security for the aircraft and the nuclear cargo. The courier officer (who has custody of the weapons) is the final authority on security matters; however, crews should follow the advice and procedures of the host security force as much as possible. If the situation is serious and crews must load and depart quickly, use judgment and dispense with the formalities. Prior to takeoff, the PIC will ensure security support at all stations being transited that day through the 618 TACC or theater C2 agency Command Center.

21.9.1. Home Station. Conduct a thorough visual search of the aircraft for unauthorized explosives or stowaways. Use a bomb detection dog if available. If time is critical, do not delay the mission to "sanitize" the aircraft.

21.9.2. On-load Base. The host base should set up a restricted area, normally with ropes and stanchions, around the aircraft.

21.9.2.1. Entry Control. Use one entry point to maintain strict control of entry into the area. The entry controller will have a roster of all personnel allowed to enter. Use a copy of the flight orders for the aircrew. Instruct the entry controller to coordinate with the aircrew courier before allowing anyone into the area. ***EXCEPTION:*** Allow the weapons convoy to enter the restricted area without delay.

21.9.2.2. "No lone zone." Do not allow anyone to be alone in the restricted area or aircraft when nuclear weapons are present (inside either the area or the aircraft). The purpose of a "no lone zone" is to prevent any one person from tampering with a nuclear weapon. The easiest way to enforce a "no lone zone" is to always be in pairs inside the restricted area (for example, two aircrew members, two shippers, or one aircrew member and one shipper). Maintain the two person concept throughout the flight. Do not allow anyone to be alone in the cargo compartment or flight deck.

21.9.3. Prior to engine shut down, deploy sufficient armed crewmembers around the aircraft to control access to the aircraft until the host base security force is established. Keep doors closed and be prepared for an immediate departure until the host base established security. Once security is established, the only personnel authorized near the aircraft are aircrew members and those support personnel necessary to install landing gear pins, ground power, and wheel chocks. Monitor these people at all times.

21.10. Emergency Procedures.

21.10.1. Security Emergencies. Crews may use deadly force to protect nuclear cargo and will resist any attempt by a hostile force to capture a nuclear weapon. Consider any attack on an aircraft loaded with nuclear cargo, including a hijacking attempt, as an attack against the nuclear weapons. Should hostages be used to gain access to, as cover for removal, or to thwart recovery of a nuclear weapon; the welfare and safety of the hostages should be considered in determining actions to be taken. However, the presence of hostages shall not deter the taking of decisive, prompt, and effective action that includes the use of deadly force to recover a nuclear weapon and to prevent unauthorized access to or removal of a nuclear weapon. If crews are attacked, take the following actions:

21.10.1.1. Make an immediate takeoff, with the cargo if possible.

21.10.1.2. If the attack occurs during on-loading or off-loading, load the weapons as fast and as safely as possible; ensure sufficient cargo restraint and takeoff immediately.

21.10.1.3. Some weapons are equipped with a CDS that internally destroys the capability of a weapon to achieve a significant nuclear yield. The CDS will be used when capture of a weapon is imminent.

21.10.1.4. Aircrews will not use emergency destruct procedures on nuclear weapons. Emergency destruction (ED) of weapons by shaped charges requires SECDEF approval and will be accomplished by qualified personnel who have the capability to receive, authenticate, and carry out ED orders. When two properly identified shipper or receiver personnel concurrently request custody of the cargo for ED purposes, release the cargo using appropriate custody transfer procedures.

21.10.2. Jettisoning Nuclear Cargo. The LM will identify which cargo is jettisonable IAW the dash-1. The PIC bears a moral obligation to jettison cargo or crash-land where the least amount of damage will result. Use the CDS, if applicable, prior to jettisoning or crash-landing. Record the coordinates of each jettisoned item. Observe the jettison restrictions in the SWOG.

21.10.3. Landing in Foreign Countries. Be prudent and keep things very low key. If confronted with demands to board or inspect the aircraft, refer to the status of US military aircraft in the FCG which states: US military aircraft are sovereign instrumentalities. US military aircraft cleared to overfly or land in a foreign territory are entitled to the privileges and immunities customarily accorded to warships. These privileges and immunities include, in the absence of stipulations to the contrary, exemption from duties and taxation; immunity from search, seizure, and inspections (including customs and safety inspection); or other exercise or jurisdiction by the host nation over the aircraft, personnel, equipment, or cargo on board. Air Force PICs 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. Diplomatically, but firmly, refuse any requests to board or inspect, and get help through any available United States channel. Flash priority is authorized.

21.11. Maintenance on Aircraft Loaded with Nuclear Cargo.

21.11.1. Maintenance on an aircraft loaded with nuclear weapons must not violate safety rules normally used with aircraft loaded with conventional explosives. As much as possible, have maintenance and servicing completed before loading nuclear weapons on the aircraft. Do not allow maintenance, such as the following, that could increase the possibility of a fire:

21.11.1.1. Using flame or uncontrolled heat-producing items.

21.11.1.2. Repairs on the fuel system, cell, and tank or other maintenance where significant fuel spills are likely to result from disconnected lines, ruptured components, etc.

21.11.2. Aircraft will not be jacked. The temporary lifting of one set of landing gear for minor maintenance (tire change, brake change, etc.) is not considered jacking.

21.11.3. Do not refuel, defuel, or service oxygen while loading or offloading nuclear weapons. Have a fire truck standing by at the aircraft during refueling, defueling, or oxygen servicing.

21.11.4. The flight engineer or crew chief will monitor all maintenance on the aircraft while nuclear cargo is on board.

21.12. Emergency Nuclear Airlift Operations Guide. This guide describes recommended actions for courier and crew during emergency nuclear airlift operations. It is designed for those missions diverted en route to an on-load site where the crew does not have the opportunity to receive a formal CRG, home station, or command post briefing. However, even if a formal briefing is given, this guide may be used as a refresher. Security, time, and ground support may not be sufficient to allow using this guide during emergency operations. In such cases, the courier and crew must discuss all factors and use their judgment on the best course of action to accomplish the mission. Safety and security is paramount in all decisions affecting transportation of nuclear cargo.

21.13. Prior to On-load. Accomplish the following, either at home station or en route to the on-load site:

21.13.1. Review crew responsibilities and the procedures to be used during on-load (loading method, security setup, cargo receipt, two-person concept). Do not discuss classified information over inter-phone.

21.13.2. DELETED.

21.13.3. En route and 30 minutes prior to landing, contact the on-load site and notify them of ETA. Make support requirements known (fuel, materials handling equipment (MHE), transportation, security, etc.) at this time.

21.14. Arrival and On-load.

21.14.1. Contact the senior security official and comply with the following: If crews have nuclear cargo on board, establish a restricted area and keep everyone off the aircraft. Provide armed security until the host security forces assume responsibility.

21.14.1.1. A restricted area will be established around the aircraft. Ropes and stanchions are normally used to denote the restricted area. However, depending on the situation, crews may see additional guards, security vehicles, etc., rather than ropes. Be flexible. The key is whether the host base is furnishing enough security to protect the nuclear cargo.

21.14.1.2. A single entry control point will be established.

21.14.2. The entry controller must allow only those individuals into the restricted area who have been cleared by the courier. Tell the entry controller which individuals are authorized into the area and, time permitting, use crew orders as an EAL and prepared shipper lists.

21.14.3. After security is established, verify shipper identification and accomplish the following with the shipper: (***NOTE:*** Accomplish the shipper briefing and cargo inspection if time and the security environment permit.)

21.14.3.1. Shipper briefing to include the following:

21.14.3.1.1. Nature, hazard, and safety regarding shipment of nuclear weapons cargo, including line numbers from TO 11N-20-11, DOD class explosive hazard class or division, and net explosive weight (NEW).

21.14.3.1.2. Courier escort requirements.

21.14.3.1.3. Items requiring the two-person concept.

21.14.3.1.4. Items that are CDS equipped and if the CDS has been activated (weapon not operational).

21.14.3.1.5. Items exposed to an abnormal environment or not operational.

21.14.3.1.6. Special handling or unique requirements particular to the cargo.

21.14.3.1.7. Individuals required to assist during on-load or off-load. Pass the information to the entry controller.

21.14.3.1.8. Authorized recipients at offload station. Get this information in writing.

21.14.3.2. Cargo inspection:

21.14.3.2.1. The primary LM, courier, and shipper will inspect the cargo for broken seals, exterior damage, security to carrier, wheel and casters, tiedown points, etc. Have the shipper annotate any discovered damage or discrepancies on the DD 1911. ***NOTE:*** Ensure the aircraft is ready for on-load prior to accepting custody of nuclear cargo.

21.14.3.2.2. After the inspection, accept custody of the cargo by signing the DD 1911.

21.14.4. During on-load or off-load monitor the operation, assist as necessary, and ensure personnel comply with the two-person concept.

21.14.5. After cargo on-load is complete and the crew is ready for engine start, the armed courier willdeplane and tell the host base security to break down security and maintain surveillance until aircraftdeparture. The courier and other armed crewmembers will monitor access to the aircraft and crew entrance door during engine start.

21.15. En Route to Offload.

21.15.1. Maintain the two-person concept.

21.15.2. Notify the 618 TACC or theater C2 agency Command Center of departure time and ETA at the offload station. Be prepared to encode this information.

21.15.3. If time permits, review the security and handling procedures to be used at the offload station. Do not discuss classified information over the interphone.

21.15.4. Contact the agency specified in flight information publications (command post, base operations, or tower) 30 minutes prior to landing; ask if they have hazardous cargo information. If they don't, pass the following information:

21.15.4.1. Call sign, type aircraft, and mission number.

21.15.4.2. ETA.

21.15.4.3. Line numbers from TO 11N-20-11 or DD 1911.

21.15.4.4. If line numbers were not provided, pass on the following information:

21.15.4.4.1. DOD explosive hazard class or division (normally 1.1).

21.15.4.4.2. NEW.

21.15.4.5. A request for isolated parking and for their security forces to meet the aircraft.

21.15.4.6. Inert devices, if applicable.

21.16. Off-load.

21.16.1. Upon arrival, deploy the armed courier (minimum) and team (if required) to provide security until the host security forces assume responsibility and establish the restricted area. Keep all doors closed and engines running until security is established.

21.16.2. Maintain the two-person concept.

21.16.3. Brief the receiver on the cargo, and transfer custody.

21.16.4. Briefing includes:

21.16.4.1. Nature, hazard, and safety regarding shipment of the nuclear weapon cargo, including line numbers from TO 11N-20-11, DOT explosive hazard class or division, DOT class, and NEW.

21.16.4.2. Courier escort requirements.

21.16.4.3. Items requiring the two-person concept.

21.16.4.4. Items that are CDS-equipped and if the CDS has been activated (weapon not operational).

21.16.4.5. Items exposed to an abnormal environment or not operational.

21.16.4.6. Special handling or unique requirements applicable to the cargo.

21.16.4.7. Individuals required to assist during the offload. Pass this information to the entry controller.

21.16.5. The receiver and courier will conduct an inspection of the cargo for broken seals, exterior damage, etc. If discrepancies are found and they have not been previously noted, the courier will annotate them on the DD 1911.

21.16.6. Transfer custody of cargo. (Receiver signs DD 1911).

21.16.7. Complete offload of cargo.

Chapter 22

SEARCH AND RESCUE PROCEDURES

22.1. General. Most searches are part of an effort to save life; therefore, make every effort to complete the search as rapidly and efficiently as possible. A thorough scan of the search area and accurate navigation significantly increase the probability of detection. Reactions to sightings must be timely and accurate. This section outlines operational procedures for conducting effective searches in the C-130 aircraft. Refer to the National SAR Manual Vol I/II for additional information.

22.2. Communications with a Distressed Aircraft:

22.2.1. Establish direct communications with the distressed aircraft as soon as possible. Accomplish this on the distressed aircraft's HF en route frequency, emergency VHF or UHF frequency, or any other frequency used by the distressed aircraft to alert air or ground facilities. The primary method of communications will be VHF or UHF when positive contact is made, see **Table 22.1**.

22.2.2. Communications procedures should instill confidence in the distressed crew so they will know professional assistance is at hand. The crew will achieve this goal by employing the following:

22.2.2.1. Coordinate immediate action items first and supplemental items as the mission progresses. Communications may be lost or the distressed crew may be forced to bail out, crash land, or ditch.

22.2.2.2. Avoid long transmissions and provide pertinent data at periodic intervals to assure the distressed crew that contact is being maintained.

22.2.2.3. Make all messages clear and concise. Know what to say and use a tone of confidence.

22.2.2.4. If direct communications are delayed or fail completely, relay pertinent data and instructions through any air or ground station in contact with both aircraft.

22.2.2.5. If all efforts to contact the distressed aircraft fail, transmit pertinent information and instructions in the blind, assuming the distressed aircraft is receiving but unable to acknowledge.

22.2.3. Use the following frequencies and procedures during an intercept:

22.2.3.1. Primary Frequency. The HF, VHF, or UHF en route frequency used by the distressed aircraft to alert air or ground stations and to request intercept.

22.2.3.2. Secondary Frequency. Designate a secondary HF frequency shortly after initial contact. Instruct the distressed aircraft to change to this frequency if contact on the primary frequency is lost for a 10-minute period. When VHF or UHF contact is established, designate a secondary frequency. Prior to changing VHF or UHF frequencies, instruct the distressed aircraft to return to primary if contact cannot be established within 30 seconds.

22.2.4. Initial Communications Procedures:

22.2.4.1. Attempt initial contact with distressed aircraft before takeoff or as soon as practical on HF, VHF, or UHF. If initial contact is on HF, designate a VHF or UHF frequency to monitor. If initial contact is on VHF or UHF, instruct distressed aircraft to monitor en route HF frequency.

22.2.4.2. Identify yourself and advise that you are en route to intercept.

22.2.4.3. Instruct the distressed crew to use the present frequency as primary and not to break contact. Designate a secondary frequency.

Table 22.1. Communications Frequencies.

EMERGENCY	RESCUE COORDINATION
ADF 500 KHz	UHF 282.8 MHz
HF 8364 KHz	VHF 123.1 MHz
UHF 243.0 MHz (Guard)	HF 3023.5 KHz
VHF 121.5 MHz (Guard)	HF 2182 KHz (Maritime Distress)
EN ROUTE SETUP	**ON-THE SCENE**
Both ADFs–500 KHz (for objects with 500 KHz beacons)	ATC Frequency
Liaison – Primary HF	HF – 2023.5 KHz (SAR on-scene
HF – 8364 or 2182 KHz	VOR – 121.5
Ship to Plane – 2182 KHz	VHF – 121.5
VOR – 121.5 MHz	UHF- 282.8 MHz and Guard for interplane
VHF 121.5 MHz	VHF-FM 156.8 MHz (153.8 for mountain areas)
UHF – GCI and Guard	
VHF-FM – 156.8 MHz (153.8 for mountain areas)	
NOTE: These are suggested radio setups. Actual frequencies used will be determined by the search objective, crew and availability of radio equipment.	

22.2.4.4. Instruct the distressed crew to transmit “emergency” on the IFF.

22.2.4.5. Obtain and evaluate the latest position, time, magnetic heading, IAS, GS, altitude, fuel remaining, personnel on board, and flight conditions of the distressed aircraft.

22.2.4.6. Verify the nature of emergency and intentions of the distressed aircraft.

22.2.4.7. If required, instruct the distressed aircraft to home on the signal transmitted by the rescue aircraft.

22.2.4.8. Transmit supplemental data as appropriate to the situation such as altimeter setting, weather, estimated time to intercept (ETI), minimum safe altitude, etc.

22.3. Lost Aircraft Procedures. Fixing, intercepting, and escorting a lost aircraft is an extremely difficult problem. Establish communications with the lost aircraft in order to initiate orientation procedures. Use all possible aids to locate the approximate position of the lost aircraft. In many cases, radar or direction finding stations will establish a bearing from the station to the lost aircraft and indicate the general direction to fly to accomplish an intercept.

22.3.1. Attempt contact with the lost aircraft as soon as possible. Climb to the highest practical altitude to increase communications range.

22.3.2. If the lost aircraft is in contact with an air or ground station within reasonable range from the base, the rescue aircraft should orbit at altitude over the appropriate station until some clue is received which indicates the general direction or position of the lost aircraft.

22.3.3. If all communication attempts prove unsuccessful, it is advisable to proceed in the most logical direction toward the lost aircraft.

22.3.4. Instruct the distressed aircraft to maintain radio contact at all costs and orbit at its present position to keep within communications range, maintaining the highest practical altitude to improve communications.

22.3.5. Ascertain amount of fuel remaining and the number of personnel aboard.

22.3.6. Maintain communications with air or ground stations capable of providing bearings, fixes, or other assistance.

22.3.7. Use every possible intercept method and electronic aid to ensure a successful mission.

22.3.7.1. Employ the electronic aid that can provide the quickest and most reliable bearing or fix on the lost aircraft.

22.3.7.2. Obtain a reliable bearing or fix and instruct the lost aircraft to leave orbit and head toward the rescue aircraft or the nearest suitable landing area.

22.3.7.3. If in voice contact with the lost aircraft and unable to establish a bearing or fix, determine its approximate position from any surface objects, landmarks, or peculiar cloud formation. Landing lights and pyrotechnic flares improve detection capabilities at night.

22.3.8. Lost Plane Fixing Procedures. (**Figure 22.1**). If the situation demands the lost airplane to land as soon as possible, determine its position and vector it to the nearest airfield as follows:

22.3.8.1. Request the lost aircraft to orbit (360-degree turns) at its present position. Take HF, VHF, or UHF radio bearing from the distressed aircraft and plot it.

22.3.8.2. Fly perpendicular to the bearing obtained for 5 minutes. Take and plot a second bearing. ***NOTE:*** Expect the lost aircraft to drift considerably if there are high winds in the orbit area.

22.3.8.3. The point where the two bearings cross is the approximate position of the lost aircraft. Compute the distance to the lost aircraft by:

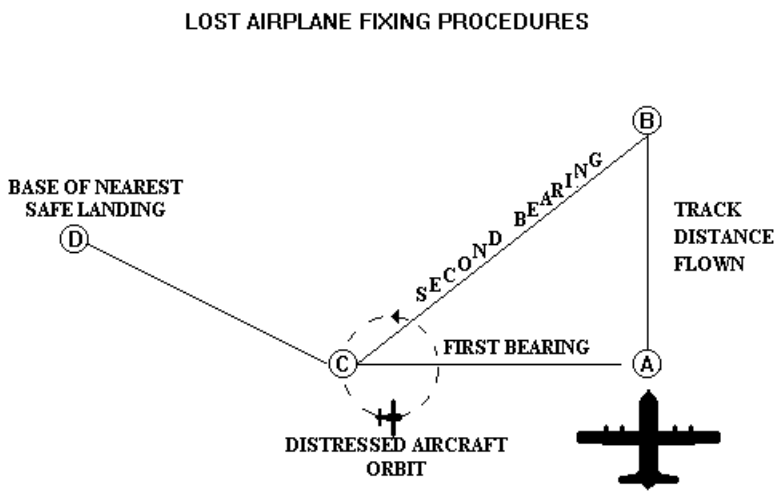
TAS X Minutes Flown

Bearing Change

22.3.8.4. The fixing procedure will work in reverse; i.e., the rescue aircraft may orbit and take bearings on the lost aircraft while it flies a constant heading. Use this reverse procedure only as a last resort.

22.3.8.5. Prior to vectoring a distressed aircraft in any direction, it is imperative to obtain a reasonably accurate position and ensure that the lost aircraft's altitude clears all terrain by a safe margin. Then relay the bearing, distance, and ETA to the closest airfield. Use an appropriate intercept course and monitor the progress of the lost aircraft.

Figure 22.1. Lost Airplane Fixing Procedures



22.4. Aircrew Search Briefings:

22.4.1. Prior to dispatch on a search mission, the entire crew will receive formal and complete briefings in accordance with this volume. ***EXCEPTION:*** When the urgency of the situation compels the crew to scramble, the duty controller will brief the PIC and navigator while the rest of the crew completes necessary aircraft inspections.

22.4.2. The PIC will brief and discuss with the crew the procedures and crew duties for the mission. The discussion will include:

22.4.2.1. Objective of the search.

22.4.2.2. Planning the search.

22.4.2.3. Position reporting.

22.4.2.4. Preparation of personnel and equipment for airborne delivery.

22.4.2.5. Preparation of flares and smoke signals.

22.4.2.6. Sighting procedures.

22.4.2.7. Feasibility of using NVGs.

22.4.2.8. Use of IDS/FLIR (some airplanes) during search.

22.4.3. Prior to beginning any low level search, complete the Search and Rescue Checklist.

22.5. Planning the Search. The pilot, in close coordination with the navigator, will evaluate the situation for search coverage required, appropriate method of search, type of search pattern required, altitude, airspeed, and track spacing.

22.5.1. Consider many factors when determining appropriate search procedures for a specific mission. Several are:

22.5.1.1. Weather conditions.

22.5.1.2. Terrain characteristics if over land.

22.5.1.3. Sea conditions if over water.

22.5.1.4. Time of search, i.e. daylight or darkness.

22.5.1.5. Survivor's signaling aids.

22.5.1.6. Objective size, shape, color contrast with surroundings, and amount of freeboard.

22.5.1.7. Status of objective; overdue, lost, crashed, or ditched.

22.5.1.8. Estimated location of objective. When accurate position information is not available, you will most likely find the objective along the intended track from the last known position (LKP) to the intended destination, and within a reasonable distance on either side of this track.

22.5.1.9. Endurance of search aircraft.

22.5.2. **Methods of Search.** The three basic methods of aerial search are visual, radar, and electronic.

22.5.2.1. Visual search is the primary method for day or night missions. Crews will use procedures outlined in this section for the most effective results.

22.5.2.2. Radar search is the primary method of search when visibility prevents an effective visual search and the objective will provide a recognizable radar target.

22.5.2.3. Use an electronic search when searching for survivors or aircraft with transceivers and radio beacons. Electronic search consists of monitoring distressed or preplanned beacon frequencies and searching for IFF transponder signals. Aircrew members will monitor applicable distress frequencies at all times while on search missions, except when making required transmissions.

22.5.3. **Intensity of Coverage.** Determine the intensity of search coverage by the size of the area to be searched, number of aircraft available for search, and probability of finding the objective. Provide search coverage as follows:

22.5.3.1. Use preliminary search coverage during the initial phases of a mission and during all night or electronic searches. This type coverage permits rapid and reasonably thorough coverage of the primary area. During this phase, assume you will easily sight or contact the search objective. Fly route, parallel, or creeping line search patterns at higher altitudes, faster airspeeds, and greater track spacing.

22.5.3.2. Use concentrated search coverage during the maximum effort phase of a mission, or when attempting to locate a sighting or objective whose location is fairly well

known. This type coverage ensures an area is thoroughly searched. Fly expanding square, parallel, creeping line, or sector search patterns at lower altitudes, slower airspeeds, and with smaller track spacing.

22.5.4. Selection of Search Area and Search Pattern. The crew will select the search area and employ search patterns most likely to succeed in locating the objective. Location and size of the search area and the employment of search patterns is dependent upon the most probable position of the incident or survivors, taking into account previously mentioned factors. Determine the most probable position of a distress incident by a fix, position report at the time of an incident, or dead reckoning estimated from the LKP. Consider the movement of the object (parachute drift, raft drift, etc.) when establishing the search pattern.

22.5.5. Select an Appropriate Search Pattern. Refer to National SAR Manual Volume I/II for additional patterns. (**Figure 22.2** through **Figure 22.7**).

22.5.5.1. Route Search. Employ the route search when the only available lead is a LKP or dead reckoning position and the intended track of the search objective. This usually is the first search employed. Assume the objective is on or adjacent to its intended track, and that the search objective will be easily discernible or possesses electronic detection aids.

22.5.5.2. Parallel Search. Use a parallel search to cover large rectangular areas where the objective is expected to be between two points and possibly off track due to navigation error. Employ this simultaneously with or immediately after completion of a route search. Also, use a parallel search during concentrated searches since navigational accuracy is increased when long search legs are used.

22.5.5.3. Creeping Line Search. When several aircraft are available, use a creeping line version of the parallel search in conjunction with or immediately after a route search. In addition, substitute the creeping line search for an expanding square search during concentrated coverage when time is not an urgent factor. It is more accurate and provides the same coverage as a square pattern.

22.5.5.4. Expanding Square Search. Use the expanding square search for concentrated search of a small area where a sighting or search objective has been reported.

22.5.5.5. Sector Search. Use the sector search when the position of distress is known within close limits and the search area is not extensive. It provides greater navigational accuracy, increased scanning opportunity, and is more flexible than the expanding square.

22.5.5.6. Contour Search. Use the contour search in mountains or hilly terrain.

22.5.6. Track Spacing. Carefully establish track spacing; it should never be greater than twice the visual detection range. By decreasing track spacing, the probability of detection is increased at the expense of time required to search a given area. The limit to which you can reduce track spacing is proportional to the limits of accuracy of navigation by search units. Optimum track spacing permits maximum expectation of target detection consistent with economic employment of search units. Generally, track spacing is greater during preliminary search than during concentrated search. Use sweep width for average conditions (**Table 22.2** through **Table 22.5**) as a basis to establish track spacing. Individuals in life jackets are almost impossible to detect unless they have signaling devices; use a detection range of 1/2

nautical mile under these circumstances. A rule of thumb for determining track spacing is: expected visual detection range times two equals track spacing.

Figure 22.2. Parallel Search Pattern in a Large Rectangular Area.

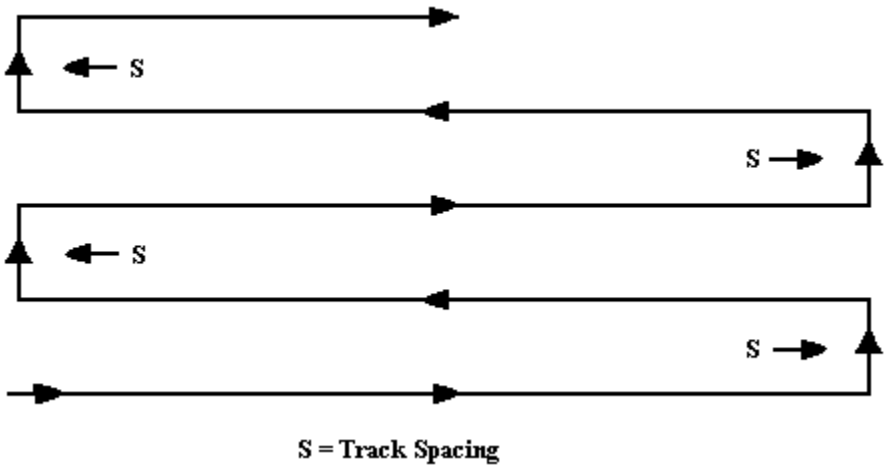


Figure 22.3. Parallel Search Pattern Along Object's Route of Flight.

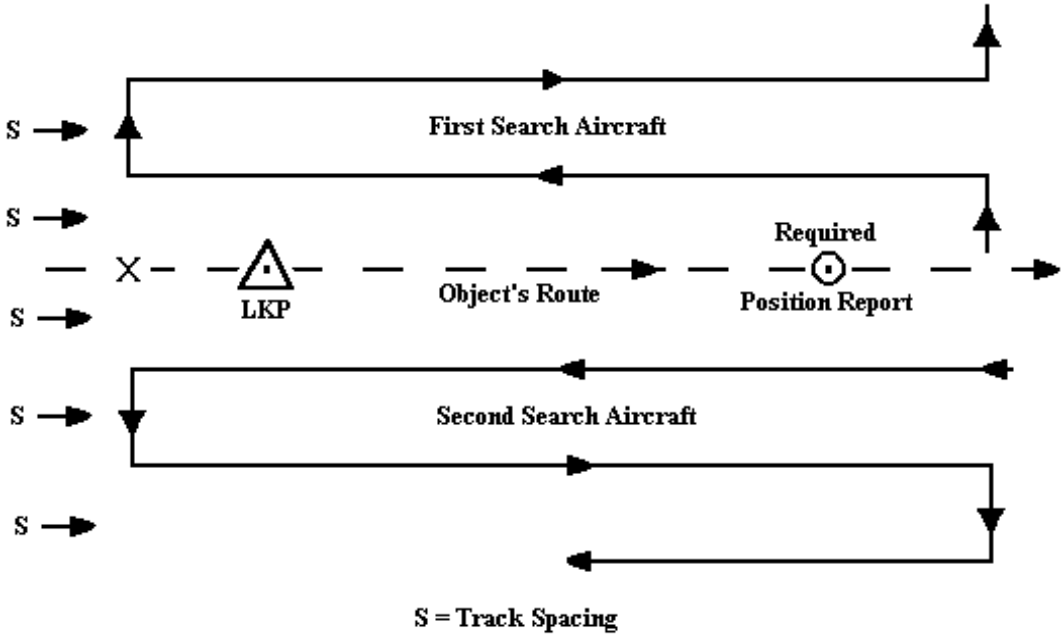


Figure 22.4. Creeping Line Search Along Object's Route of Flight.

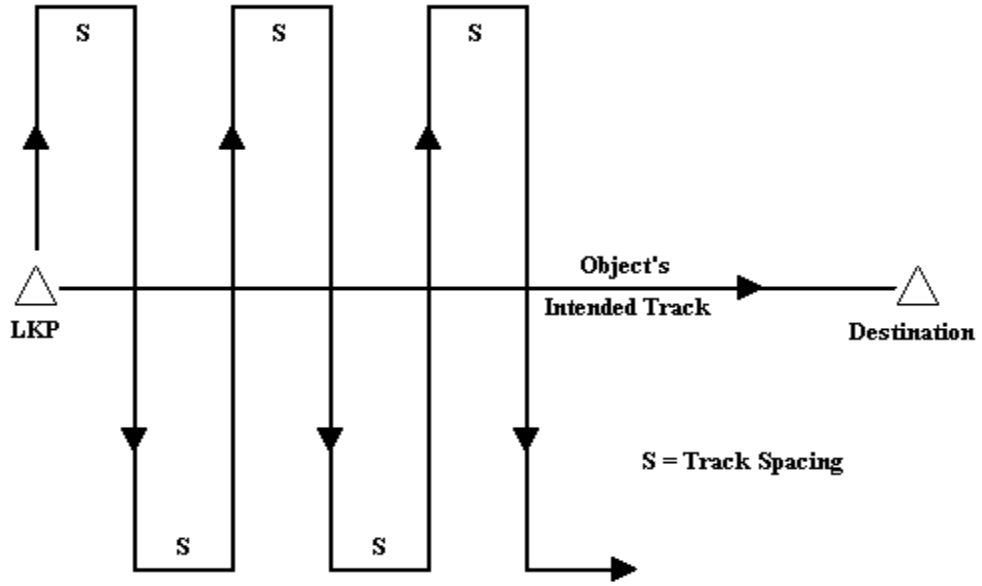


Figure 22.5. Sector Search.

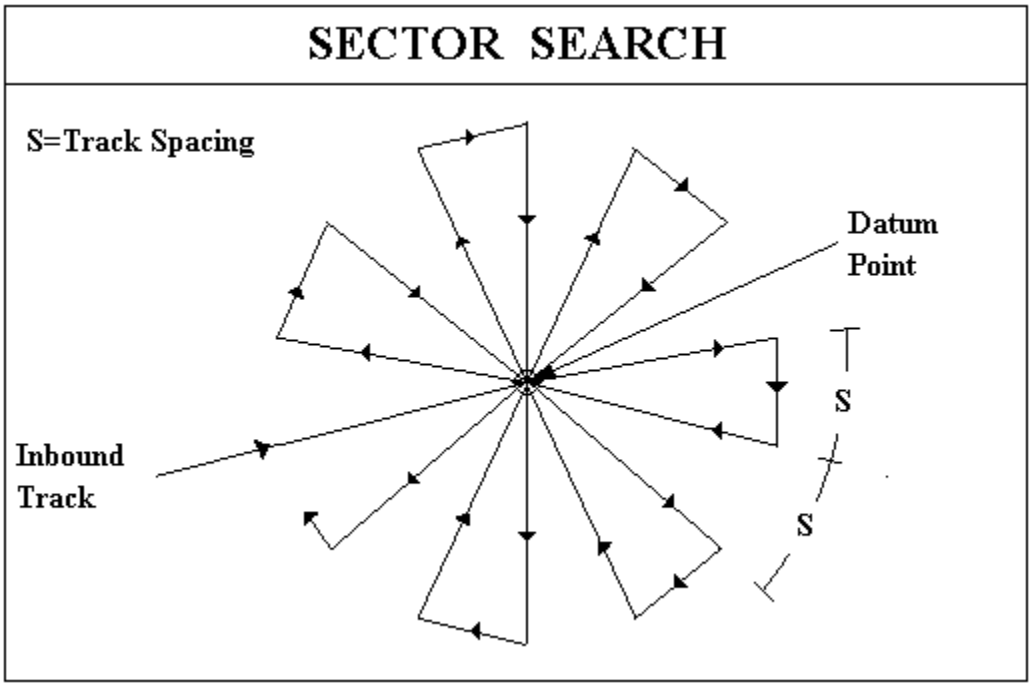


Figure 22.6. Creeping Line Pattern Used in Lieu of Square Search.

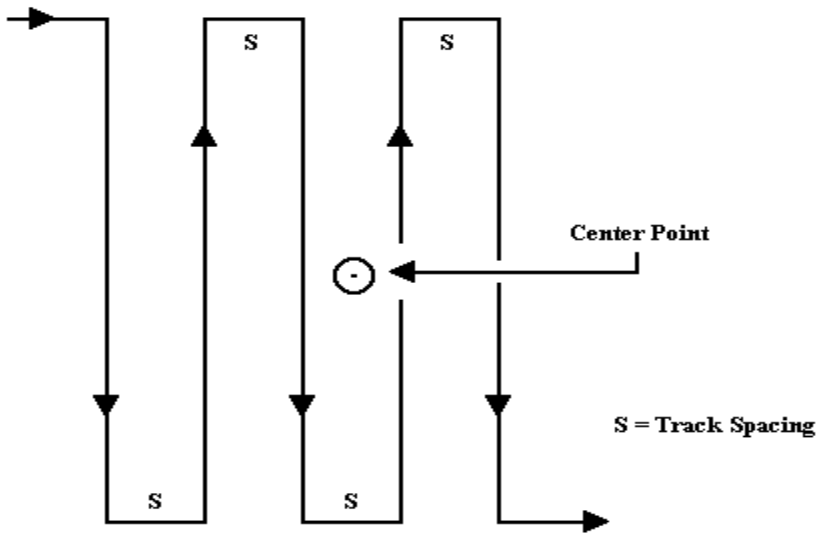


Figure 22.7. Expanding Square Search.

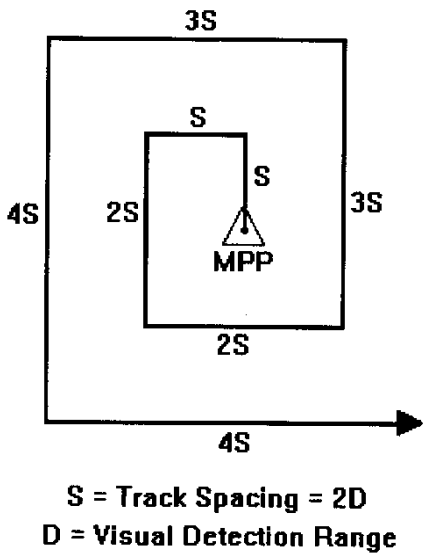


Table 22.2. Sweep Width For Visual Search in Nautical Miles.

	LIFE RAFTS				SMALL BOATS (LESS THAN 30 FEET)					SMALL BOATS (30 TO 60 FEET)				
SEARCH ALTITUDE X100 FT ===>	**0**	**5**	**10**	**20**	**0**	**5**	**10**	**20**	**30**	**0**	**5**	**10**	**20**	**30**
1 NM VIS	0.5	0.5	0.5	--	0.5	0.5	0.5	--	--	0.5	0.5	0.5	--	--
3 NM VIS	1.0	1.2	1.2	1.0	2.5	2.4	2.3	1.8	0.4	3.5	3.0	2.7	1.8	0.4
5 NM VIS	1.4	1.6	1.6	2.7	2.7	2.7	2.7	3.2	3.3	4.2	4.2	4.2	4.2	3.3
10 NM VIS	1.8	1.8	2.1	3.6	3.9	4.0	4.2	4.5	5.8	6.5	6.2	6.2	6.2	6.5

	LIFE RAFTS				SMALL BOATS (LESS THAN 30 FEET)					SMALL BOATS (30 TO 60 FEET)				
SEARCH ALTITUDE X100 FT ===>	**0**	**5**	**10**	**20**	**0**	**5**	**10**	**20**	**30**	**0**	**5**	**10**	**20**	**30**
15 NM VIS	1.9	1.9	2.6	3.6	5.2	5.3	5.5	6.7	7.0	8.5	8.5	8.4	8.4	8.3
20 NM VIS	2.0	2.1	2.8	3.6	5.3	5.6	6.2	6.8	7.1	8.6	8.8	9.0	9.1	8.9
30 NM VIS	2.2	2.3	2.9	3.6	5.5	6.2	7.0	7.0	7.1	8.7	9.5	10.4	10.1	9.7

Table 22.3. Whitecap Correction Factors

WIND (KNOTS)	**0**	**10**	**15**	**20**	**25**	**30**	**40**
RAFTS	0.8	1.0	0.9	0.7	0.5	0.2	0.1
SMALL BOATS	0.9	1.0	1.1	1.0	0.9	0.7	0.2
DYE MARKER	0.9	1.0	1.0	0.9	0.6	0.4	0.2
SMOKE	0.8	1.0	0.8	0.6	0.4	0.2	0.1

Table 22.4. Cloud Cover Factors

PERCENT CLOUD COVER	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
CLOUD COVER FACTOR	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7

Table 22.5. Expected Detection Range for Visual Aids (30 Miles Visibility).

DAYTIME		**NIGHTIME**	
DYE MARKER	4 Miles (reduced to nil in heavy seas)	FLOAT LIGHT	20 Miles
MIRROR	8 Miles	Mk 13 FLARE	22 Miles
ORANGE SMOKE	12 Miles (greatly reduced in high winds)	VERY LIGHT	24 Miles
WHITE SMOKE	16 Miles (greatly reduced in high winds)		

NOTE: Basic sweep width value X whitecap correction factor X cloud cover factor = corrected sweep width value.

22.5.7. Search Altitude. Select an optimum search altitude based upon the object of search, weather in the search area, electronic or visual location aids used, and any other known factor which would affect the search altitude. Generally, the lower the search altitude, the better the chance of seeing an object, provided the altitude is not so low that the aircraft speed becomes detrimental. During preliminary searches, the altitude will be higher to detect possible

signals at greater distances. Recommend altitudes in **Table 22.6** when other known factors permit their use.

Table 22.6. Recommended Search Altitudes.

RECOMMENDED ALTITUDES OVER WATER	EXPECTED TARGET
500 feet and below	Survivor without raft or dye marker.
500 feet to 1000 feet	Survivor in raft without dye marker or signaling device.
1000 feet to 2500 feet	Survivor has dye marker.
1000 feet to 3000 feet	Survivor has signaling device or radar reflector.
2000 feet to 3000 feet	Expecting to find wreckage during initial phase of the mission.
2000 feet	During night over water.
RECOMMENDED ALTITUDES OVER LAND	
1000 feet	Survivors of an aircraft incident over level terrain with little foliage.
500 feet	Survivors of an aircraft incident over level terrain with heavy foliage.
500 feet to 1000 feet	Survivors of an incident in mountainous terrain.
2000 feet	Expecting to find wreckage.
2000 feet	Over land at night.
RECOMMENDED ALTITUDES FOR ELECTRONIC BEACONS	
8000 feet or higher	

22.5.8. Search Speed. During preliminary searches, fly the aircraft at a speed that permits rapid coverage of the search area yet allows scanners an opportunity to detect large objects, signals, or wreckage. An optimum airspeed under these circumstances is 200 knots IAS. During concentrated search, fly the aircraft at airspeeds based on aircraft gross weight as depicted in the Aircraft Performance Manual. Conduct electronic searches at cruising speed unless otherwise directed.

22.6. Search Procedures:

22.6.1. Rescue missions often involve commitment based upon calculated risks. Give full consideration to all safety factors. Timely reaction to all search missions is essential to the safety of personnel or equipment. Do not jeopardize safety by inadequate preparation or short cuts to expedite takeoff, or arrival at search areas. For search missions use the Pre-Search Checklist contained in AFTTP 3-3.25. Aircrews will comply with all other applicable directives which govern their duties, such as:

22.6.1.1. Accomplish complete predeparture flight planning except for scramble missions. On scramble missions, complete essential flight planning prior to and shortly after takeoff.

22.6.1.2. Use in-flight procedures in accordance with the appropriate theater of operation flight regulations. Search aircraft may be operated below minimum altitudes and visibilities under the provisions of AFI 11-202V3.

22.6.1.2.1. Aircraft will maintain vertical and horizontal separation in the search area. This is critical when several aircraft are searching within close proximity.

22.6.1.2.2. Transmit operation normal (position) reports as required by the controlling agency.

22.6.1.2.3. Use appropriate call signs.

22.6.2. The following general instructions apply to all search missions:

22.6.2.1. Brief crewmembers who did not attend the operations briefing on the purpose of the mission.

22.6.2.2. Scanners who are not aircrew members will receive a briefing on the search objective.

22.6.2.3. The PIC will supervise and coordinate activities of crewmembers during preparation for search, as follows:

22.6.2.3.1. Plan the search with the navigator(s).

22.6.2.3.2. Discuss with all crewmembers scanning procedures.

22.6.2.3.3. Discuss with the navigator(s) and copilot the procedures for making search pattern turns.

22.6.2.3.4. Discuss the radio communication procedures with the crew (**Table 22.1**).

22.6.2.3.5. Discuss the preparation of flares, sea dyes, and smoke signals for deployment with the loadmaster.

22.6.2.3.6. Discuss the preparation of personnel and equipment for airborne delivery with the loadmaster and pararescuemen. Ensure all crewmembers are thoroughly familiar with the checklists to be used for various airborne delivery options.

22.6.2.4. The PIC will coordinate crewmember activities during prosecution of the search by:

22.6.2.4.1. Ensuring completion of the Search and Rescue Checklist prior to commencing any low level search.

22.6.2.4.2. Alerting the scanners to begin scanning when approaching the search area.

22.6.2.4.3. Directing crewmember to put on their LPUs prior to descending below 2,000 feet over water.

22.6.2.4.4. Checking with crewmembers to ensure all equipment and personnel are ready for action in the event of a sighting.

22.6.2.4.5. Making periodic checks of fuel remaining to ensure sufficient fuel remains for return to home station.

22.6.2.5. Report all deviations from assigned search procedures to the on-scene commander or mission commander.

22.6.2.6. Thoroughly investigate sightings and report findings immediately. Initiate recovery action or assistance when the survivors are located and inform appropriate agencies of the progress.

22.6.2.7. The navigator(s) will:

22.6.2.7.1. Maintain an accurate record of area searched.

22.6.2.7.2. Direct the aircraft to ensure proper coverage of the search area.

22.6.2.7.3. Continually cross check headings, drift, time, airspeed, and altitude to maintain the best possible search coverage.

22.6.2.7.4. Use a large scale chart when searching over land to ensure terrain and obstacle clearance. Use a search pattern graph as a suitable reference while searching over water.

22.6.2.7.5. Record sighting information on log and plot position on navigation chart.

22.6.2.7.6. Monitor equipment during radar and electronic searches.

22.6.2.7.7. Debrief controlling agency with an accurate depiction of any areas searched.

22.6.2.7.8. When other aircraft are involved, with the assistance of the ACS, track and assign search areas for other aircraft.

22.6.2.8. The ACS will maintain radio communications with other search aircraft and the controlling agency as directed by the PIC.

22.6.2.9. The loadmaster will assume supervision of the scanners and will schedule rotation and rest periods.

22.6.2.10. All crewmembers will assist with the scanning duties when possible.

22.6.2.11. When a search is completed with negative results, consider searching the area again. Normally, position subsequent search legs between or 45 degrees to the previous search legs. This procedure, in effect, results in smaller track spacing.

22.6.3. In the search area:

22.6.3.1. Descend to search altitude (**Table 22.6**).

22.6.3.2. Have navigator obtain the wind at search altitude. To visually cover the area thoroughly, slow the airspeed during search patterns (refer to the Aircraft Performance Manual).

22.6.3.3. Notify ATC of arrival on scene and estimated endurance.

22.6.3.4. Vector other aircraft to the scene.

22.6.3.5. Use radar (some life rafts carry reflectors).

22.6.3.6. Assume on-scene command until relieved by another duly appointed SAR aircraft. As other aircraft arrive, do the following:

22.6.3.6.1. Establish contact on channels other than Guard.

22.6.3.6.2. Obtain aircraft type identification, endurance, and rescue capability.

22.6.3.6.3. Assign altimeter setting, frequencies, search areas, patterns, and altitude separation.

22.6.3.7. If leaving the search area because of lack of fuel, assign another aircraft as on-scene commander.

22.6.4. Determine an accurate wind prior to and throughout the search by SCNS, INS, Doppler, or wind plottage. To determine wind direction and velocity by plottage, the following apply:

22.6.4.1. Crestlines of waves on the surface of the water are perpendicular to the direction of the wind. Ripples and bow waves break away from the wind (downwind). The foam of whitecaps formed by breaking waves always appear to slide into the wind (upwind).

22.6.4.2. There may be streaks in the water parallel to the wind direction. These streaks are called wind lanes.

22.6.4.3. Turn aircraft so its longitudinal axis is aligned with the direction of movement of ripples, whitecaps, waves, or wind streaks.

22.6.4.4. Read compass to determine magnetic direction of wind or its reciprocal (convert to true values, if necessary).

22.6.4.5. Determine the direction in which ripples, waves, or whitecaps are moving to obtain actual direction of wind.

22.6.4.6. Determine wind velocity by observing the appearance of the surface (**Table 22.7**).

Table 22.7. Wind and Sea Prediction Chart.

WIND VELOCITY IN KNOTS	HEIGHT OF WAVES IN FEET	BEAUFORT NUMBER	SEA INDICATIONS
Calm	0	0	Like a mirror.
1-3	1/2	1	Ripples with the appearance of scales
4-6	1	2	Small wavelets, crests have glassy appearance.
7-10	2	3	Large wavelets, crests begin to break: scattered whitecaps.
11-16	5	4	Small waves, becoming longer. Fairly frequent white caps.
17-21	10	5	Moderate waves, taking pronounced long form; many whitecaps.

WIND VELOCITY IN KNOTS	HEIGHT OF WAVES IN FEET	BEAUFORT NUMBER	SEA INDICATIONS
22-27	15	6	Large waves begin to form; white foam crests more extensive; some spray.
28-33	20	7	Sea heaps, white foam from breaking waves blown in streaks along direction of waves.
34-40	25	8	Moderately high waves of greater length; crests break into spindrift; foam blown in well marked streaks in direction of wind.
41-47	30	9	High waves, dense streaks of foam; sea begins to roll; spray affects visibility.
48-55	35	10	Very high waves with overhanging crests; foam in great patches blown in dense white streaks. Whole surface of sea takes on a white appearance. Visibility affected.

22.6.5. When flying search patterns, turns must be accurate and uniform as possible. The following procedures are provided to assist the aircrew in making precise turns:

22.6.5.1. Fly the aircraft on autopilot when possible.

22.6.5.2. Prior to starting the pattern, the navigator will brief the crew on the direction and rate of turn and the turn command procedure used.

22.6.5.3. Normally, all turns are standard rate (3 degrees per second) unless track spacing is less in distance than the diameter of a standard turn at a given speed. In this situation, continue turn to 180 degrees and adjust turn rate as required to remain within the pattern.

22.6.5.4. On any search pattern employing a succession of 90-degree standard rate turns separated by cross legs, use the following procedure for computing time to begin each turn:

22.6.5.4.1. Compute time required to fly entire first leg using ground speed for that leg.

22.6.5.4.2. Subtract 19 seconds from the time computed in **paragraph 22.6.5.4.1**.

22.6.5.4.3. Add the difference obtained in **paragraph 22.6.5.4.2** to start search time. Resultant will be the time to begin the first 90-degree turn.

22.6.5.4.4. Compute time required to fly the entire second leg using ground speed for that leg.

22.6.5.4.5. Subtract 8 seconds from time computed in **paragraph 22.6.5.4.4**.

22.6.5.4.6. Add the difference obtained in **paragraph 22.6.5.4.5** to start search time. Resultant will be the time to begin the first 90-degree turn.

22.6.5.4.7. To compute ensuing turn times, continue to subtract 8 seconds from successive full leg time and add the resultant to previous turn time.

22.6.5.5. Search Pattern Execution:

22.6.5.5.1. Route Search. Route search consists of one search leg along a given track. Normally, start the search leg at a point nearest the search aircraft's departure and search along the route of flight between the LKP and the intended destination. If the LKP is a position report, search between the LKP and the report where the next report was due. Extend the track approximately 25 NM to allow for navigational error on the part of the missing aircraft.

22.6.5.5.2. Parallel Search. **(Figure 22.2** and **Figure 22.3).** Use the parallel search to cover an area on each side of the search objectives intended track or an assigned rectangular area beginning on the corners. This pattern is a series of parallel legs (tracks) advancing from one side of an area to the other. The longer search legs will parallel the search objective's intended track or the long side of a rectangular search area. The short legs (cross legs) of a parallel search will be equal to track spacing.

22.6.5.5.3. Creeping Line Search. **(Figure 22.4** and **Figure 22.6):**

22.6.5.5.3.1. The creeping line search is a series of parallel tracks advancing along a given track. The longer legs are perpendicular to the given track and are sufficient in length to allow for navigational error or drift of the search objective. The cross legs of a creeping line search will be equal to track spacing.

22.6.5.5.3.2. Use the creeping line search pattern to cover an area on both sides of the search objective's intended track during and after route searches. Begin the pattern at one end of the intended track or at an assigned point along the track.

22.6.5.5.3.3. During concentrated search coverage, begin at the nearest corner and use the creeping line search to cover an assigned rectangular pattern.

22.6.5.5.4. Expanding Square Search. (**Figure 22.7**):

22.6.5.5.4.1. The expanding square search is a series of search legs which expand outward forming a square pattern. The first and second legs are equal in length to track spacing and each two succeeding legs are increased in length by a distance equal to track spacing. Legs are flown at right angles and all turns are made to the right.

22.6.5.5.4.2. Begin the search at the center point of the area of highest probability. Normally, this pattern will not cover an area over 20 NM square. To minimize navigational error, plan for upwind-downwind and crosswind legs. Use cardinal headings if the wind is negligible or time does not permit adequate planning.

22.6.5.5.5. Sector Search. (**Figure 22.5**):

22.6.5.5.5.1. The sector search is a series of legs which originates from a datum point. The resulting close track spacing increases probability of detection near the datum point (center) and larger track spacing at the extremities. Each long leg is equal to the diameter of the area where the objective is most likely to be found and the cross legs are equal to computed track spacing.

22.6.5.5.5.2. Begin at the datum point. Drop a smoke or other suitable reference marker over the datum point to facilitate precise search legs. Drop additional markers as required throughout the pattern. When planning the search, align the first leg with the search objective's direction of movement, drift, or with the most expeditious heading and make all turns to the right.

22.6.5.5.5.3. Determine the heading of the succeeding leg using the information shown in **Table 22.8**. Each successive leg is determined by adding 90 degrees, plus the angle change (0) to the previous leg.

22.6.5.5.6. Contour Search. (**Figure 22.8** and **Figure 22.9**):

22.6.5.5.6.1. Use the contour search to search mountainous or hilly terrain. Fly search legs around a peak or back and forth along the side of the mountain, depending upon the size and accessibility of the search area. As one contour circuit or leg is completed, normally decrease the altitude 500 feet and commence a new leg. Make turns away from the mountain during descent at the end of each leg when searching the side of the mountain.

Table 22.8. Sector Search Pattern Computation.

	SECTOR SEARCH COMPUTATION								
	Track Spacing								
		1-0/t/T	**2**-0/t/T	**3**-0/t/T	**4**-0/t/T	**6**-0/t/T	**8**-0/t/T	**10**-0/t/T	**15**-0/t/T
SEARCH RADIUS	5	6/21/1/6	12/23/0.8	18/25/0.6	25/27/0.5				
	10	3/20/5.4	6/21/3.0	9/22/2.0	12/23/1.6	18/25/1.2	25/27/0.8		
	15	2/20/12.0	4/20/6.2	6/21/4.6	8/22/3.6	12/23/2.6	15/24/2.0	20/26/1.6	
	20	1.5/19/21	3/20/11.2	4.5/21/7.6	6/21/5.8	9/22/4.2	12/23/3.4	15/24/2.8	24/27/1.8
	25		2.5/20/16.2	3.5/20/11.0	5/21/8.6	7.5/21/6.0	9.5/22/5.0	12/23/4.0	18/25/2.8
	30			3/20/16.6	4/20/11.8	6/21/8.8	8/22/6.8	10/22/5.8	15/24/4.0
	40				3/20/22.0	4.5/21/15.2	6/21/11.8	7.5/21/9.8	11/23/7.4
		0=Degrees to add to 90 degrees							
		t=First turn correction (deduct 11 seconds for successive turns)							

	SECTOR SEARCH COMPUTATION

22.6.5.5.6.2. The navigator will use the largest possible terrain contour chart (JOG or TPC) available. Mark the areas searched thoroughly for debriefing with the controlling agency.

Figure 22.8. Contour Search of Mountain Peak

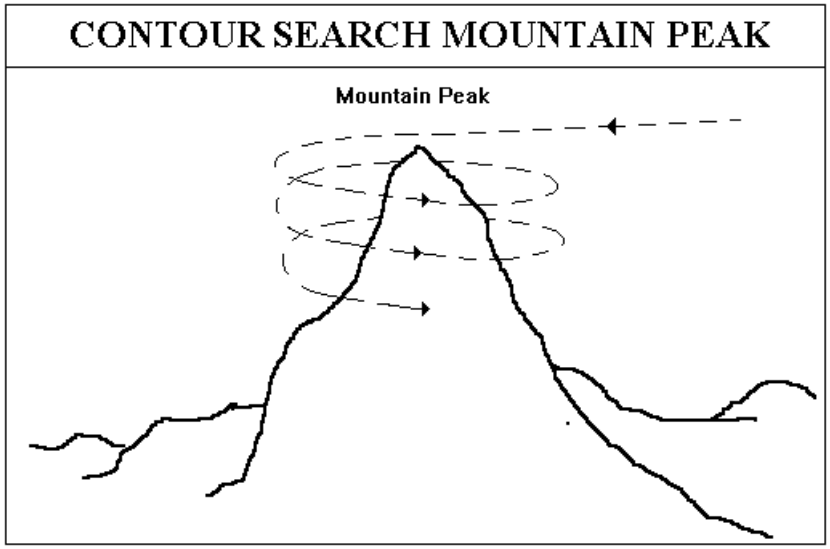
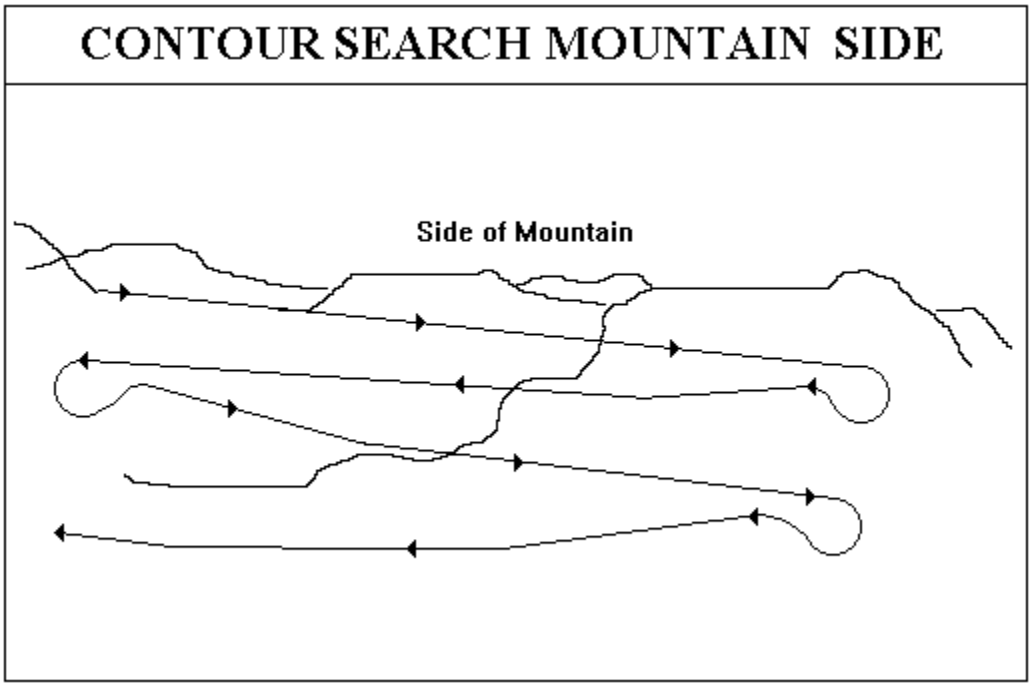


Figure 22.9. Contour Search of Mountain Side



22.6.5.5.6.3. Start searching above the highest peak or ridge. Use extreme care

during the search. Do not search when terrain conditions, high winds, turbulence, visibility. Or weather conditions create a hazard to safe flight.

22.6.5.5.6.4. The pilot flying the aircraft will devote full attention to evaluating forward terrain for clearance and hazards to flight.

22.6.5.5.6.5. All crewmembers will be especially watchful for power lines, cables, etc.

22.6.5.5.6.6. Evaluate the area for turbulence and down drafts before descending to search altitude and flying close to a mountain side, as severe down drafts (2000 feet per minute and greater) may occur. Do not fly where winds exceed 25 knots.

22.6.5.5.6.7. Search from top to bottom, never from bottom to top. Search 500 feet above and away from the terrain at all times, never closer.

22.6.5.5.6.8. Exercise extreme caution when searching in canyons and valleys. Ensure adequate clearance before entering the area. Always maintain an "out." Plan ahead of the aircraft and know which way to turn in an emergency.

22.6.5.5.6.9. The PIC will ensure all loose equipment is securely fastened or tied down during mountain searches. Crewmembers will be strapped in if duties permit.

22.7. Sighting Procedures:

22.7.1. When a sighting is made, the appropriate crewmember will notify the rest of the crew over interphone and indicate the position of the sighting by using the clock system; e.g., "Pilot, right scanner, target sighted at 4 o'clock, 500 yards."

22.7.2. Immediately upon making a sighting, drop a smoke signal or sea dye marker to mark the approximate location of the sighting. During search missions, have marking devices readily available to jettison. The crewmember who launches the smoke will announce "SMOKE AWAY" over the interphone. ***NOTE:*** During the presearch briefing, the PIC should designate who will launch smokes to mark a sighting. This will ensure a smoke is launched and preclude inadvertent multiple launches.

22.7.3. Following the launching of a smoke signal and other marker, make a procedure turn to bring the aircraft back over the target, or if the observer can keep the target in sight, the PF should immediately turn in the direction of the target. The observer will continue to call out the target position and distance to orient the pilot. As the turn progresses, the pilot or copilot should be able to acquire the target.

22.7.4. The following procedures are for confirmed sightings:

22.7.4.1. Keep the target in sight at all times. Mark with dye marker or smoke floats.

22.7.4.2. Turn on IFF.

22.7.4.3. Report the sighting to the rescue center, OSC, air or ground station, or operating agency, as appropriate. This report should include:

22.7.4.3.1. Position.

22.7.4.3.2. Number of survivors.

22.7.4.3.3. Condition of survivors.

22.7.4.3.4. Type of emergency equipment used or needed by survivors.

22.7.4.3.5. Action already taken or assistance needed.

22.7.4.3.6. Condition of weather and sea.

22.7.4.3.7. Fuel remaining in hours.

22.7.4.4. Orbit the scene. When two planes are available, one should climb to an altitude that ensures radar detection by other craft or land bases, and the other should remain low, keeping the target in sight. Both aircraft should remain on station until relieved by other aircraft, rescue or recovery has been effected, or forced to return to base because of low fuel. In the latter event, mark the position with the best means available before departing the search area.

22.7.4.5. Drop available emergency equipment and/or personnel, if required. If survivors are in life jackets, make attempts as soon as possible to furnish them with life rafts or other survival equipment and signaling devices. For rescue equipment drops use the appropriate airdrop procedure contained in **Chapter 19**.

22.7.4.6. Direct potential rescue or recovery vessels and other aircraft to the scene by radio or visual signals. Radio and visual signals you may use to direct a vessel to the scene to include:

22.7.4.6.1. Radio message to the vessel. (If unsure of frequency guarded by the vessel, use 2182 KHz voice or 156.8 MHz VHF or FM.)

22.7.4.6.2. ADF to take bearings on a vessel's LF or MF transmissions.

22.7.4.6.3. VHF or UHF direction finder to take bearings of VHF or UHF transmissions.

22.7.4.6.4. Radar and IFF.

22.7.4.6.5. Signal light.

22.7.4.6.6. Dropping message containers.

22.7.4.6.7. Pyrotechnic flares.

22.7.4.6.8. When radio communications are not possible, establish self-identification, then indicate location of the target by:

22.7.4.6.8.1. Circling the vessel at least once at low altitude.

22.7.4.6.8.2. Flying across the bow of the vessel at least once, and rocking wings at the same time.

22.7.4.6.8.3. Sending a message by signal light or dropping a message, if possible.

22.7.4.6.8.4. Heading in the direction of the target. Repeat this procedure until the vessel acknowledges by following the aircraft, or indicates that it is unable to comply by hoisting the International Flag, November (the International Flag, November, is a blue and white checkerboard). Crossing the wake of the vessel

close astern at a low altitude means that the service of the vessel to which the signal is directed is no longer required.

22.7.4.7. In daytime, use any of the following means to inform survivors they have been sighted:

22.7.4.7.1. Fly low over survivors with landing lights on.

22.7.4.7.2. Blink a signal light in the direction of survivors.

22.7.4.7.3. Drop two smoke signals a few seconds apart.

22.7.4.8. Aircrews sighting survivors at night should:

22.7.4.8.1. Mark the position by dropping smoke floats or float lights.

22.7.4.8.2. Request assistance from other search aircraft or ships.

22.7.4.8.2.1. If a rescue vessel arrives in the area, direct it to the scene by giving the target position in relation to the float light. Drop parachute flares to assist the rescue or recovery vessel in sighting the target.

22.7.4.8.2.2. If the objective has not been located, but its position is fairly well established, drop two float lights to outline the limits of the search area, the most probable position of target being halfway between the lights. Start the search from one light to the other, dropping parachute flares for illumination.

22.7.4.8.2.3. If no surface vessel is available, but two aircraft are on-scene, have one aircraft fly over the area at 3,000 feet dropping flares at 2- or 3-mile intervals. Station the other aircraft 3 miles behind the illuminating aircraft, slightly upwind at 500 feet to search.

22.8. Scanning Techniques. Precise scanning is one of the most important aspects of a search. During a search, all crewmembers will make a cursory examination of the area. For maximum effectiveness; however, assign personnel primary duties as scanners. If available, assign personnel other than the basic crew to these duties. Thoroughly brief scanners on techniques prior to beginning a search.

22.9. Departing Search Area:

22.9.1. Notify ATC and the appropriate SAR agency on-scene SAR aircraft, Rescue Coordination Center, etc.

22.9.2. If other search aircraft have not arrived, reconfirm position, and advise survivors when further assistance will arrive, if known.

22.10. Adopted Forms.

AF Form 4076, *Aircraft Dash 21 Equipment Inventory*

AMC Form 41, *Flight Authorization*

AMC Form 43, *AMC Transient Aircrew Comments*

AMC Form 54, *Aircraft Commander's Report on Services/Facilities*

AMC Form 148, *Boarding Pass*

AMC Form 196, *Aircraft Commander's Report on Crewmember*

AF IMT 5, *United States Air Force Invoice*

AF Form 8, *Certification of Aircrew Qualification*

AF Form 15, *United States Air Force Invoice*

AF Form 70, *Pilot's Flight Plan and Flight Log*

AF Form 72, *Air Report (AIREP)*

AF Form 129, *Tally In-Out*

AF Form 523, *USAF Authorization to Bear Firearms*

AF Form 457, *USAF Hazardous Report*

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

AF Form 664, *Aircraft Fuels Documenting Log*

AF Form 673, *Request to Issue Publication*

AF Form 711, *USAF Mishap Report*

AF Form 711GA, *Life Science Report of an Individual Involved in an AF Accident/Incident*

AF Form 813, *Request for Environmental Impact Analysis*

AF Form 847, *Recommendation for Change of Publication*

AF Form 1199, *Air Force Entry Control Card*

AF Form 1297, *Temporary Issue Receipt*

AF Form 1381, *USAF Certification of Aircrew Training*

AF Form 1631, *NATO Travel Order*

AF Form 1994, *Fuels Issue/Defuel Document (DOD)*

AF Form 3211, *Customer Comments*

AF Form 3858, *C-130/C-141 Aeromedical Offload Message*

AF Form 4031, *Crew Resource Management (CRM) Assessment Sheet*

AF Form 4051, *Pilot's Low Level Airdrop Plan*

AF Form 4053, *INS Flight Plan and Log*

AF Form 4063, *Mini TOLD Card*

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

AF Form 4069, *Tiedown Equipment Checklist*

AF Form 4075, *Aircraft Load Data Worksheet*

AF Form 4091, *Mission Data*

AF Form 4108, *C-130 Fuel Log*

AF Form 4137, *International Standardization Agreement Ratification Implementation Data Sheet*

AFTO Form 46, *Prepositioned Life Support Equipment Inventory*

AFTO Form 781, *AFORMS Aircrew/Mission Flight Data Document*

AF Form 781H, *Aerospace Vehicle Flight Status and Maintenance Document*

Customs Form 7507, *General Declaration (Outbound/Inbound)*

DD Form 365-3, *Chart C-Basic Weight and Balance Record*

DD Form 365-4, *Weight and Balance Clearance Form F-Transport/Tactical*

DD Form 1748, *Joint Airdrop Inspection*

DD Form 1748-D, *Airdrop Malfunction Report (Personnel/Cargo)*

DD Form 1801, *DOD International Flight Plan*

DD Form 1896, *Jet Fuel Identaplate*

DD Form 1898, *AV Fuels into Plane Sales Slip*

DD Form 1911, *Material Courier Receipt*

DD Form 2131, *Passenger Manifest*

DD Form 2133, *Joint Airlift Inspection Record*

Immigration Form 92, *Aircraft/Vessel Report*

Immigration Form 94, *Arrival/Departure Record*

Standard Form 44, *Purchase Order-Invoice-Voucer*

22.11. Prescribed Forms.

AF IMT 4062, *C-130 Run-In/Drop Information Card*

AF IMT 4116, *C-130 Flight Plan and Record*

CARROL H. CHANDLER, Lt Gen, USAF
DCS, Air, Space & Information Operations, Plans & Requirements

(934AW)

DARRELL G. YOUNG, Colonel, USAFR
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 10-403, *Deployment Planning and Execution,* 13 Jan 08

AFI 10-701, *Operations Security (OPSEC),* 18 Oct 07

AFI 10-801, *Assistance to Civilian Law Enforcement Agencies,* 15 Apr 94

AFI 11-202V2, *Aircrew Standardization/Evaluation Program,* 08 Dec 06

AFI 11-202V3, *General Flight Rules,* 05 Apr 05

AFI 11-209, *Aerial Event Policy and Procedures,* 04 May 06

AFI 11-214, *Air Operations Rules and Procedures,* 22 Dec 05

AFI 11-215, *USAF Flight Manuals Program (FMP),* 22 Dec 08

AFI 11-218, *Aircraft Operation and Movement on the Ground,* 11 May 05

AFI 11-231, *Computed Air Release Point Procedures,* 31 Aug 05

AFI 11-299, *Nuclear Airlift Operations* (FOUO), 19 Mar 08

AFI 11-2C-130V1, *C-130 Aircrew Training,* 19 Jul 06

AFI 11-301V1, *Aircrew Life Support (ALS) Program,* 25 Feb 09

AFI 11-301V2, *Maintenance and Configuration Requirements for Mobility Air Forces Aircrew and Aircraft Installed Life Support Equipment (LSE),* 01 May 06

AFI 11-401, *Aviation Management,* 07 Mar 07

AFI 11-403, *Aerospace Physiological Training Program,* 20 Feb 01

(Added-934AW) AFI 11-418_934AWSUP, *Operations Supervision*, 19 April 2007

AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking)* (FOUO), 15 Apr 94

AFI 13-210_IP, *Joint Airdrop Inspection Records, Malfunction Investigations, and Activity Reporting,* 23 Jun 09

AFI 13-212, *Range Planning and Operations,* 16 Nov 07

AFI 13-217, *Drop Zone and Landing Zone Procedures,* 10 May 07

AFI 21-101, *Aerospace Equipment Maintenance Management,* 29 Jun 06

AFI 24-101, *Passenger Movement,* 27 Oct 04

AFI 31-101, *Integrated Defense* (FOUO), 08 Oct 09

AFI 31-207, *Arming and Use of Force by Air Force Personnel,* 29 Jan 09

AFI 31-401, *Information Security Program Management,* 01 Nov 05

AFI 32-2001, *Fire Emergency Services Program,* 09 Sep 08

AFI 33-324, *The Information Collections and Reports Management Program: Controlling Internal, Public, and Interagency Air Force Information Collections,* 01 Jun 00

AFI 33-360, *Publications and Forms Management Program,* 18 May 06

AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel,* 02 Aug 06

AFI 48-123, *Medical Examinations and Standards,* 24 Sep 09

AFI 91-202, *The US Air Force Mishap Prevention Program,* 01 Aug 98

AFI 91-204, *Safety Investigations and Reports,* 24 Sep 08

AFPD 10-21, *Air Mobility Lead Command Roles and Responsibilities,* 01 May 98

AFPD 10-9, *Lead Operating Command Weapon Systems Management,* 21 Jun 02

AFPD 11-2, *Aircraft Rules and Procedures,* 14 Jan 05

AFPD 33-3, *Information Management,* 28 Mar 06

(Added-934AW) 934 AWI 13-202, Airfield Operations, 26 Oct 2010

AFH 11-203V1, *Weather for Aircrews,* 1 Mar 97

AFH 11-203V2, *Weather for Aircrews,* 16 May 02

AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials,* 11 Nov 94

AFPD 90-9, *Operational Risk Management,* 01 Apr 00

AFJI 13-210, *Joint Airdrop Inspection Records, Malfunction Investigations, and Activity Reporting*

AFJI 48-104, *Quarantine Regulation of the Armed Forces,* 24 Jan 92

AFMAN 11-217V1, *Instrument Flight Procedures,* 03 Jan 05

AFMAN 11-217V3, *Supplemental Flight Information,* 23 Feb 09

AFMAN 23-220, *Reports of Survey for Air Force Property,* 01 Jul 96

AFMAN 24-204_IP, *Preparing Hazardous Materials for Military Air Shipments,* 01 Sep 09

AFMAN 33-363, *Management of Records,* 01 Mar 08

AFOSHSTD 91-38, *Hydrocarbon Fuels – General,* 01 Sep 97

AFPAM 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques,* 01 Feb 04

AFTTP 3-1.1 (S), *General Planning and Employment Considerations*

AFTTP 3-1.2 (S), *Threat Reference Guide and Countertactics*

AFTTP 3-1.25 (S), *Tactical Employment—C-130*

AFTTP 3-3.25, *Combat Aircraft Fundamentals—C-130,* 16 Feb 07

AMCI 11-208, *Tanker/Airlift Operations,* 1 Jun 00

AMCI 11-301, *Aircrew Life Support (ALS) Program,* 1 Aug 97

DESC-1-31, *Purchase of Aviation Fuel and Services at Commercial Locations,* 9 May 08

DOD 4500.9-R, *Defense Transportation Regulation Part V,* Jun 08

DOD 4515.13R, *Air Transportation Eligibility,* 15 Jan 10

FLIP, *DOD Flight Information Publication,* Various

FM 101-5-1, *Operational Terms and Symbols,* 21 Oct 05

JCS Pub 1-02, *DOD Dictionary of Military and Associated Terms,* Mar 94

TO 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding,* 15 Jul 02

TO 1-1-300, *Functional Check Flights and Maintenance Operational Checks,* 14 Nov 07

TO 1-1B-50, *Weight and Balance,* 1 Apr 08

TO 13C7-51-21, *Airdrop of Supplies and Equipment—Rigging Loads for Special Operations,* 19 Sep 07

TO 1C-130A-21, *Equipment Inventory List, C-130 Airplanes,* 14 Jan 08

TO 1C-130A-9, *Cargo Loading Manual,* 7 Dec 09

TO 1C-130E(H)/H/(K)H/(L)H-1, *Flight Manual,* 15 Jan 08

TO 1C-130X-5, *Basic Weight Checklist and Loading Data,* 13 Sep 99

TO 1C-130X-6CF, *Acceptance and/or Functional Check Procedures Manual,* 31 Dec 05

(Added-934AW) ***Adopted Forms***

(Added-934AW) AF IMT 315, *United States Air Force AVFuels Invoice*

(Added-934AW) AF IMT 853, *Air Force Wildlife Strike Report*

(Added-934AW) AMC IMT 97, *AMC In-Flight Emergency and Unusual Occurrence Worksheet*

Abbreviations/Acronyms

AC—Aircraft Commander

ACCA—Aircrew Contamination Control Area

ACDE—Aircrew Chemical Defense Ensemble

ACF—Acceptance Check Flight

ACM—Additional Crew Member

AD—Airdrop

ADI—Attitude Director Indicator

ADIZ—Air Defense Identification Zone

ADS—Aerial Delivery System

AE—Aeromedical Evacuation

AECM—Aeromedical Evacuation Crew Member

AEOO—Aeromedical Evacuation Operations Officer

AERPS—Aircrew Eye Respirator Protection System

AFCS—Automatic Flight Control System

AFI—Air Force Instruction

(Added-934AW) AFMAN—Air Force Manual

AFMC—Air Force Mission Commander

AFPD—Air Force Policy Directive

AFRC—Air Force Reserve Component

AFSAS—Air Force Safety Automated System

AGE—Aircraft Ground Equipment

AGL—Above Ground Level

AHAS—Avian Hazard Advisory

AIREP—Air Report

ALC—Aircrew Laptop Computer

ALE—Automated Link Establishment

ALS—Aircrew Life Support

ALTRV—Altitude Reservation

ALZ—Assault Landing Zone

AMC—Air Mobility Command

AMCC—Air Mobility Control Center

AMD—Air Mobility Division

AMOCC—Air Mobility Operations Control Center

AMCC—Air Mobility Control Center

AMT—Air Movement Table

ANG—Air National Guard

AOA—Angle of Attack

AOC—Air and Space Operations Center

AOR—Area of Responsibility

AP—Auto Pilot

APOD—Aerial Port of Disembarkation

APU—Auxiliary Power Unit

AR—Air Refueling

ARA—Airborne Radar Approach

ARC—Air Reserve Component

ARMS—Aeromedical Readiness Missions

ARTCC—Air Route Traffic Control Center

ASRR—Airfield Suitability and Restrictions Report

ATA—Actual Time of Arrival

ATC—Air Traffic Control

(Added-934AW) ATCAA—Air Traffic Control Assigned Airspace

ATIS—Automated Terminal Information Service

ATO—Air Tasking Order

ATOC—Air Terminal Operations Center

AUX—Auxiliary

AWADS—Adverse Weather Aerial Delivery System

BAM—Bird Avoidance Model

BASH—Bird/Wildlife Aircraft Strike Hazard

BCN—Beacon

BDHI—Bearing Distance Heading Indicator

BRNAV—Basic Area Navigation

BSS—Bus Switching System

BSU—Bus Switching Unit

BWA—Biological Warfare Agent

C2—Command and Control

CARA—Combined Radar Altimeter

CAT I—Category I Approach

CAT II—Category II Approach

CARP—Computed Air Release Point

CB—Circuit Breaker or Center of Balance

CBRNE—Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive

CBTA—Chemical-Biological Threat Area

CCA—Contamination Control Area

CCT—Combat Control Team

CDS—Container Delivery System or Command Disable System

CDT—Crew Duty Time

CECR—Crew Enhancement Crew Rest

CFL—Critical Field Length

CFP—Computer Flight Plan

CFR—Crash Fire Rescue

CG—Center of Gravity

CHUM—Chart Updating Manual

COMSEC—Communications Security

CONOPS—Concept of Operations

CONUS—Continental United States

CRA—Country Risk Assessment

CRG—Contingency Response Group

CRM—Crew Resource Management

CRRC—Combat Rubber Raiding Craft

CS—Concurrent Servicing

CSAR—Combat Search and Rescue

CSS—Chief Servicing Supervisor

CVR—Cockpit Voice Recorder or Centerline Vertical Restraint

CW—Chemical Warfare

C2IPS—Command and Control Information Processing System

DAO—Defense Attaché Office

DCS—Defense Courier Service

DER—Departure End of Runway

DFSC—Defense Fuel Supply Center

DGH—Desired Grid Heading

DH—Decision Height

DIRMOBFOR—Director of Mobility Forces

DMAAC—Defense Mapping Agency Aeronautical Center

DME—Distance Measuring Equipment

DNIF—Duties Not Including Flying

DOD—Department of Defense

DOT—Department of Transportation

DSN—Defense Switching Network

DTC—Distance to Climb

DV—Distinguished Visitor

DZ—Drop Zone

EAL—Entry Authorization List

ED—Emergency Destruct

EDP—Earliest Descent Point

EEBD—DELETED

EMI—Electromagnetic Interference

EMP—Electromagnetic Pulse

ENAF—Emergency Nuclear Airlift Force

EOD—Explosive Ordinance Disposal

EP—Evaluator Pilot

EPJD-L—Extraction Parachute Jettison Device-Light

EPJS—Extraction Parachute Jettison System

EPOS—Emergency Passenger Oxygen System

(Added-934AW) ER—Exceptional Release

ERO—Engine Running On/Offload

ESA—Emergency Safe Altitude

ETA—Estimated Time of Arrival

ETB—Estimated Time in Blocks

ETD—Estimated Time of Departure

ETE—Estimated Time En route

ETI—Estimated Time to Intercept

ETIC—Estimated Time in Commission

ETP—Equal Time Point

EZ—Exchange Zone

FAA—Federal Aviation Administration

FAF—Final Approach Fix

FAR—Federal Aviation Regulation

FBI—Federal Bureau of Investigation

(Added-934AW) FBO—Fixed Base of Operation

FCB—Flight Crew Bulletin

FCC—Flying Crew Chief

FCF—Functional Check Flight

FCG—Foreign Clearance Guide

FCIF—Flight Crew Information File

FDP—Flight Duty Period

FIR—Flight Information Region

FL—Flight Level

FLIP—Flight Information Publications

FM—Flight Manager

FMC—Full Mission Capable

FMP—Flight Manual Program

FOB—Forward Operating Base

FOD—Foreign Object Damage

FOL—Forward Operating Location

FPA—Flight Path Angle

FP—Flight Pilot

FPM—Feet Per Minute

FRAG—Fragmentation Order

FRH—Flames Ration Heater

FS—Flight Station or Flight Surgeon

FSO—Flight Safety Officer

FSS—Flight Service Station

FSAF—First Suitable Airfield

FSRT—Firm Scheduled Return Time

FTC—Fuel to Climb

FTU—Formal Training Unit

G/S—Glide Slope

GCA/CADS—Ground Control Approach/Computer Aerial Delivery System

GCAS—Ground Collision Avoidance System

GCE—Ground Crew Ensemble

GDSS—Global Decision Support System

GFE—Government Furnished Equipment

GFS—Glendale Filter System

GMRS—Ground Mark Release System

GMT—Greenwich Mean Time

GP—General Planning

GPS—Global Positioning System

GPWS—Ground Proximity Warning System

GRADS—Ground Radar Aerial Delivery System

GS—Ground Speed

GSI—Glideslope Indicator

GTC—Gas Turbine Compressor

GW—Gross Weight

HAA—Height Above Airport

HAHO—High Altitude High Opening

HALO—High Altitude Low Opening

HARP—High Altitude Release Point

HAT—Height Above Touchdown

HATR—Hazardous Air Traffic Report

HDG—Heading

HE—Heavy Equipment

(Added-934AW) HERK—Hostile Environment Kits

HF—High Frequency

HH—Handheld

HQ—Have Quick

IACC—Integrated Aircrew Chemical Coverall

IAS—Indicated Airspeed

IAW—In Accordance With

IBS—Small Inflatable Boat

ICAO—International Civil Aviation Organization

ICDS— Improved Container Delivery System

ICS—Infant Car Seat

IFF—Identification Friend or Foe

IFM—Integrated Flight Management

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

IMT—Integrated Management Tool

INOP—Inoperative

INS—Inertial Navigation System

INT—Intermediate Thrust

IP—Initial Point

IPE—Individual Protective Equipment

IR—Infrared

ISU—Iridium Subscriber Unit (ISU).

JA/ATT—Joint Airborne/Air Transportability Training

JCS—Joint Chief of Staff

JM—Jumpmaster

JMD—Jumpmaster Directed

JOSAC—Joint Operational Support Airlift Center

JPADS—Joint Precision Airdrop Delivery System

JSOC—Joint Special Operations Communications

KCAS—Knots Calibrated Airspeed

KIAS—Knots Indicated Airspeed

LKP—Last Known Position

LM—Loadmaster

LOC—Localizer

LOP—Line of Position

LPU—Life Preserver Unit

LRC—Long Range Cruise

LSAF—Last Suitable Airfield

LZ—Landing Zone

MAC—Minimum Altitude Capable

MAF—Mobility Air Forces

MAFFS—Modular Airborne Fire Fighting System

MAJCOM—Major Command

MAP—Missed Approach Point

MC—Mission Commander or Mission Contributing

MCD—Medical Crew Director

MDA—Minimum Descent Altitude

MDS—Mission Design Series

MEFF—Maximum Endurance Fuel Flow

MEGP—Mission Essential Ground Personnel

ME—Mission Essential

MEL—Minimum Equipment List

MEP—Mission Essential Personnel

MFF—Military Free Fall

MFFPC—Military Free Fall Parachute Course

MH—Magnetic Heading

MHE—Materials Handling Equipment

MISREPS—Mishap Reports

MLO—MAFFS Liaison Officer

MMD—Moving Map Display

MMO—Mission Mobility Observer

MNPS—Minimum Navigation Performance Specification

MOB—Main Operating Base

MOCA—Minimum Obstruction Clearance Altitude

MOST—Mobile Oxygen Storage Tanks

MPD—Mobility Pilot Development

MPI—Multiple Points of Impact

MR—Mission Ready

MRE—Meals Ready to Eat

MSL—Mean Sea Level

MSA—Minimum Safe Altitude

MTR—Military Training Route

MWS—Missile Warning System

NAF—Numbered Air Force

NCFF—Normal Cruise Fuel Flow

NEW—Net Explosive Weight

NLT—Not Later Than

NM—Nautical Mile

NMCS—Not Mission Capable Supply

NMR—Non-Mission Ready

NOAA—National Aeronautical and Atmospheric Administration

NOTAM—Notices to Airmen

NSN—National Stock Number

NVG—Night Vision Goggles

OAT—Outside Air Temperature

OB—Operating Base

OCONUS—Outside the Continental United States

OEI—One Engine Inoperative

OG/CC—Operations Group Commander

OI—Open Item

OPORD—Operations Orders

OPLAN—Operations Plan

OPREP—Operational Report

ORM—Operational Risk Management

OSA—Operational Support Airlift

OSC—On Scene Commander

OSI—Office of Special Investigation

OST—Off Station Trainer

PA—Public Address

PAA—Primary Assigned Aircraft

PACAF—Pacific Air Forces

PAR—Precision Approach Radar

PBE—Protective Breathing Equipment

PCM—Passenger Compartment Monitor

PF—Pilot Flying

PFPS—Portable Flight Planning Software

PI—Point of Impact

PIC—Pilot in Command

PJ—Pararescue

PMCR—Post Mission Crew Rest

PMSV—Pilot to Metro Service

PNAF—Prime Nuclear Airlift Force

PM—Pilot monitoring

PO—Pads Operator

POC—Point of Contact

POK—DELETED

POL—Petroleum/Oils/Lubricants

PPI—Plan Position Indicator

PRM—Precision Runway Monitor

PRP—Personnel Reliability Program

PT—Physiological Technician

(Added-934AW) QA—Quality Assurance

RA—Resolution Advisory

RAMZ—Rigging Alternate Method Zodiac

RAS—Retriever Assist Strap

RCR—Runway Condition Reading

RDD—Radiation Dispersal Device

RDS—Records Disposition Schedule

RNP—Required Navigation Precision

RRFL—Required Ramp Fuel Load

RSC—Runway Surface Condition

RVR—Runway Visual Range

RVSM—Reduced Vertical Separation Minimum

SAAM—Special Assignment Airlift Mission

SAM/CSM—Special Air Mission/Command Support Mission

SATB—Simulated Airdrop Training Bundle

SATCOM—Satellite Communications

SCA—Self-Contained Approach

SCNS—Self-Contained Navigation System

SDP—Special Departure Procedure

SECDEF—Secretary of Defense

SECOMP—Secure En Route Communications Package

SID—Standard Instrument Departure

SIGMET—Significant Meteorological Information

SII—Special Interest Item

SITCO—Shell International Trading Company

SKE—Station Keeping Equipment

(Added-934AW) SOF—Supervisor of Flying

SPINS—Special Instructions

SPR—Single Point Refueling

SQ/CC—Squadron Commander

STT—Special Tactics Team

SWOG—Special Weapons Overflight Guide

TACC—Tanker Airlift Control Center

TALO—Tactical Airlift Liaison Officer

TAS—True Airspeed

TCAS—Traffic Collision and Avoidance System

TDY—Temporary Duty

TFF—Terminal Fuel Flow

TFM—Tactical Formation Maneuvering

TO—Technical Order

TOA—Time of Arrival

TOAT—Total Outside Air Temperature

TOGW—Take Off Gross Weight

TOT—Time Over Target

TPRS—Towed Parachutist Retrieval System

TR—Transformer Rectifier

TTC—Time to Climb

TWCF—Transportation Working Capital Fund

UAB—Underwater Acoustical Locator Beacon

UE—Unit Equipped

UMD—Unit Manning Document

USAFE—United States Air Forces Europe

USFS—United States Forest Service

UV—Ultra-Violet

VFR—Visual Flight Rules

VIRS—Verbal Initiated Release System

VMC—Visual Meteorological Conditions

VRA—Virtual Risk Assessment

VVI—Vertical Velocity Indicator

VVIP—Very, Very Important Part

WG/CC—Wing Commander

WRF—Wing Relieving Fuel

X-FEED—Crossfeed

XFER—Transfer

XMIT—Transmit

ZFW—Zero Fuel Weight

Terms

618th Tanker Airlift Control Center (618 TACC)—The 618 TACC reports to the 18th Air Force and is the global air operations center responsible for centralized command and control of Air Force and commercial air mobility assets. Plans, schedules and tracks tanker, airlift, and aeromedical evacuation aircraft worldwide to efficiently and effectively accomplish Air Mobility Command's Global Reach mission. The 618 TACC provides aircrews with mission details, support, training and authority necessary to successfully execute their mission.

Additional Crew Member—Mobility aircrew members and authorized flight examiners possessing valid aeronautical orders who are authorized to accompany the normal crew complement required for that mission according to **Chapter 3**.

Aeromedical Evacuation—Fixed-wing movement of patients requiring supervision by aeromedical evacuation crewmembers to locations offering appropriate levels of medical care.

Aeromedical Evacuation Crew Member—Qualified Flight Nurses (FN), Aeromedical Evacuation Technicians (AET), performing AE crew duties.

Aeromedical Evacuation Operations Officer (AEOO)—Also call AECC Medical Service Corps (MSC) officer or medical administrative specialist or technician (AFSC 4A0X1) assigned to the AE system to perform duties outlined in applicable Air Force policy directives, instructions, 41-series handbooks, and this AFI.

Air Force Satellite Communication (AFSATCOM)—Satellite communications system capable of 75 bits per second (BPS) record message traffic.

Air Force Component Commander (AFCC)—In a unified, sub-unified, or joint task force command, the Air Force commander charged with the overall conduct of Air Force air operations.

Air Mobility Control Center (AMCC).—Provides global coordination of tanker and airlift for AMC and operationally reports to the 618 TACC. Functions as the AMC agency that manages and directs ground support activities and controls aircraft and aircrews operating AMC strategic missions through overseas locations.

Air Mobility Division (AMD).—One of five divisions of the AOC the AMD integrates and supports air mobility missions. They coordinate with the JFC, theater AMOCC (if established) and 618 TACC in planning, tasking and executing theater air mobility missions.

Airlift—Aircraft is considered to be performing airlift when manifested passengers or cargo are carried.

Air Reserve Component (ARC)—Refers to Air National Guard and AFRC forces, both Associate and Unit Equipped.

Air Route Traffic Control Center (ARTCC)—The principal facility exercising en route control of aircraft operating under instrument flight rules within its area of jurisdiction. Approximately 26 such centers cover the United States and its possessions. Each has a communication capability to adjacent centers.

Air Traffic Control (ATC)—A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

Allowable Cabin Load (ACL)—The maximum payload that can be carried on an individual sortie.

Assault Landing Zone (ALZ)—A paved or semiprepared (unpaved) airfield used to conduct operations in an airfield environment similar to forward operating locations. ALZ runways are typically shorter and narrower than standard runways.

Augmented Crew—Basic aircrew supplemented by additional qualified aircrew members to permit in-flight rest periods.

Bird/Wildlife Aircraft Strike Hazard (BASH)—An Air Force program designed to reduce the risk of bird/wildlife strikes.

Bird Watch Condition Low - Normal bird/wildlife activity [as a guide, fewer than 5 large birds (waterfowl, raptors, gulls, etc.) or fewer than 15 small birds (terns, swallows, etc.)] on and above the airfield with a low probability of hazard. Keep in mind a single bird in a critical location may elevate the Bird Watch Condition (BWC) to moderate or severe.

Bird Watch Condition Moderate: - Increased bird population (approximately 5 to 15 large birds or 15 to 30 small birds) in locations that represent an increased potential for strike. Keep in mind a single bird in a critical location may elevate the BWC to moderate or severe.

Bird Watch Condition Severe - High bird population (as a guide, more than 15 large birds or 30 small birds) in locations that represent an increased potential for strike. A single bird in a critical location may cause a severe BWC.

Block Time—Time determined by the scheduling agency responsible for mission accomplishment for the aircraft to arrive at (block in) or depart from (block out) the parking spot.

Blue Bark—US military personnel, US citizen civilian employees of the Department of Defense (DOD), and the dependents of both categories who travel in connection with the death of an immediate family member. It also applies to designated escorts for dependents of deceased military members. Furthermore, the term is used to designated property shipment of a deceased member.

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 overwater 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.

Chalk Number—Number given to a complete load and to the transporting carrier.

Charge Medical Technician (CMT)—A qualified AET who supervises other AETs in aircrew positions on an AE mission.

Circular Error Average (CEA)—Indicator of the accuracy of an airdrop operation. It is the radius of a circle within which half of the airdropped personnel and items or materiel have fallen.

Circular Error Record (Individual)—Maintained for all navigators who are airdrop qualified. See AFI 11-231.

Coin Assist—Nickname used to designate dependent spouses accompanying dependent children and dependent parents of military personnel reported missing or captured who may travel space available on military aircraft for humanitarian purposes on approval of the Chief of Staff, United States Army; Chief of Staff, United States Air Force; Chief of Naval Operations; or the Commandant of the Marine Corps.

Command and Control (C2)—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called C2.

Command and Control Center (CC) (C2)—Each CC provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this AFI, CCs include operations centers, command posts, Air Mobility Division, tanker airlift control elements (CRG), air mobility control centers, and tanker task forces.

Command and Control Information Processing System (C2IPS)—Computer-based information transmission and information handling for command and control functions

associated with the Director of Mobility Forces (DIRMOBFOR), AMD, wing operations center, and CRG. Interfaces to and automatically updates the Global Decision Support System (GDSS).

Computer ARA—An ARA flown on AWADS-equiped aircraft using AWADS procedures.

Conference SKYHOOK—Communication conference available to help aircrews solve in-flight problems that require additional expertise.

Contingency Fuel.—Contingency fuel is an identified extra to compensate for unforeseen circumstances during any phase of flight (i.e. unforcasted weather, launch delay, etc).

Contingency Mission—Mission operated in direct support of an OPORD, OPLAN, disaster, or emergency.

Contingency Response Group (CRG)—Team of qualified Air Force personnel established to control, coordinate, and function as an Air Force tanker and airlift C2 facility at a base where normal AMC C2 facilities are not established or require augmentation. CRGs support and control contingency operations on both a planned and no-notice basis.

Critical Phase Of Flight—Takeoff, low level (below MSA), airdrop, approach, and landing.

Deadhead Time—Duty time for crewmembers positioning or de-positioning for a mission or mission support function and not performing crew duties.

Depressurization Fuel.—The additional fuel required to protect the aircraft and occupants in the event of a cabin depressurization followed by an extended diversion to an alternate airport at low altitude where fuel consumption is increased.

Designated Courier—Officer or enlisted member in the grade of E-5 or above of the US Armed Forces, or a Department of State diplomatic courier, selected by the Defense Courier Service (DCS) to accept, safeguard, and deliver DCS material as directed. A primary aircrew member should be used as a courier only as a last resort.

Desolate Terrain Missions—Any mission in excess of one hour over desert, tropical, or jungle terrain (not to include flights conducted over the CONUS).

Deviation—A deviation occurs when takeoff time is not within -20/+14 minutes of scheduled takeoff time.

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).

Director, Mobility Forces (DIRMOBFOR)—The DIRMOBFOR is the COMAFFOR's and/or JFACC's designated coordinating authority for air mobility with all commands and agencies internal and external to the joint force. The DIRMOBFOR is normally a senior officer with an extensive background in air mobility operations and is familiar with the area of responsibility (AOR). The DIRMOBFOR provides mobility direction and guidance to the Air Mobility Division in the theater air and space operations center (AOC).

Distinguished Visitor (DV)—Passengers, including those of friendly nations, of star or flag rank or equivalent status to include diplomats, cabinet members, members of Congress, and other individuals designated by the DOD due to their mission or position (includes BLUE BARK and COIN ASSIST).

Double Blocking—When an aircraft is required to block-in at one parking spot, then move to normal parking for final block-in. The extra time required for double blocking will be taken into account during mission planning/scheduling. To compensate for double blocking on departure, the aircrew "legal for alert time" may be adjusted to provide additional time from aircrew "show time" to departure. When double blocking is required on arrival, the aircrew's entry into crew rest will be delayed until postflight duties are complete.

Drop Zone (DZ)—A specified area upon which airborne troops, equipment, or supplies are airdropped.

Due Regard—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, politically sensitive missions, or training activities. Flight under "Due Regard" obligates the military aircraft commander 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.)

DZ Entry Point—A fixed point on DZ run-in course where an aircraft or formation of aircraft may safely begin descent from IFR en route altitude to IFR drop altitude. The DZ entry point is a maximum of 40 NM prior to the DZ exit point according to Federal Aviation Administration FAR exemption 4371C. Formation descent will not begin until the last aircraft in formation is at or past the DZ entry point.

DZ Exit Point—A fixed point on the DZ escape flight path centerline, established during pre-mission planning, at which the formation will be at the minimum IFR en route altitude. Calculate the exit point based upon three-engine performance at airdrop gross weight. This point will be planned no less than four NMs track distance beyond the DZ trailing edge.

Earliest Descent Point (EDP)—Earliest point in the DZ run-in course where the lead aircraft may begin IFR descent to IFR drop altitude and be assured of terrain clearance for the entire formation. Compute EDP by subtracting formation length from the computed DZ entry point.

Equal Time Point—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.

Estimated Time In Commission (ETIC)—Estimated time required to complete required maintenance.

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.

Firm Scheduled Return Time (FSRT)—Scheduling tool used by air mobility units to predict when crews will return to home station. FSRT for active duty, ANG, and AFRC is defined as SRT plus 24 hours.

First Suitable Airfield (FSAF)—The first suitable airfield available after completing the Category I route segment.

Fix—A position determined from terrestrial, electronic, or astronomical data.

Forced Rendezvous Point (FRP)—Navigational checkpoint over which formations of aircraft join and become part of the main force.

Global Decision Support System (GDSS)—AMC's primary execution command and control system. GDSS is used to manage the execution of AMC airlift and tanker missions. GDSS2 will become AMC's primary C2 platform when fielded.

Global Decision Support System 2 (GDSS2)—AMC's primary execution command and control system to replace C2IPS and GDSS. GDSS2 is used to manage the execution of AMC airlift and tanker missions.

Global Patient Movement Requirements Center (GPMRC)—A joint activity reporting directly to the Commander in Chief, US Transportation Command, the Department of Defense single manager for the regulation of movement of uniformed services patients. The Global Patient Movement Requirements Center authorizes transfers to medical treatment facilities of the Military Departments or the Department of Veterans Affairs and coordinates intertheater and inside continental United States patient movement requirements with the appropriate transportation component commands of US Transportation Command.

Ground Time—Interval between engine shut down (or arrival in the blocks if engine shutdown is not scheduled) and next takeoff time.

Hazardous Cargo or Materials (HAZMAT)—Articles or substances that are capable of posing significant risk to health, safety, or property when transported by air and classified as explosive (class 1), compressed gas (class 2), flammable liquid (class 3), flammable solid (class 4), oxidizer and organic peroxide (class 5), poison and infectious substances (class 6), radioactive material (class 7), corrosive material (class 8), or miscellaneous dangerous goods (class 9). Classes may be subdivided into divisions to further identify hazard (i.e., 1.1, 2.3, 6.1, etc.).

Improved Container Delivery System (ICDS). Improved CDS bundles utilize a 26—foot ring slot high-velocity parachute and wind drop sondes dropped before the cargo drop to get a more accurate in-flight CARP. ICDS are usually dropped only from high altitudes.

In-Place Time (IPT)—Time when an aircraft and crew are at an operating base and prepared to load for the mission.

Instructor Supervision—Supervision by an instructor of like specialty (see also Direct Instructor Supervision).

Integrated Flight Management (IFM)—IFM is the set of integrated C2 processes and supporting technologies producing seamless planning and execution of air mobility sorties. It is designed to increase the safety, risk-mitigation, effectiveness, and efficiency of air mobility operations. IFM is the basis for an enhanced C2 capability that enables shared situational awareness, predictive analysis, collaborative decision making, and dynamic retasking of operational sorties when changes in combatant commander requirements or the environment occur. It anticipates obstacles to sortie success and removes or mitigates them so that mission legs are planned and flown at optimum level. The core of IFM is the Flight Manager. Flight managers work with the Aircrews, Air Traffic Services, and appropriate C2 agencies through a synchronized process to perform preflight planning of the sortie and assess its progress

throughout the prelaunch and airborne segments. If obstacles to sortie success arise on the ground or in the air, Flight Managers proactively take action to avoid them or lessen their impact.

Interfly—The exchange and/or substitution of aircrews and aircraft between Mobility Air Forces (MAF) including crewmembers and/or aircraft from AETC, ACC, PACAF, USAFE and AMC-gained ANG and AFRC forces.

Joint Airborne/Air Transportability Training (JA/ATT)—Continuation and proficiency combat airlift training conducted in support of DOD agencies. Includes aircraft load training and service school support. HQ AMC publishes JA/ATT tasking in AMC OPORD 17-76, annex C, appendix 1.

Joint Precision Airdrop Delivery System (JPADS). Joint Precision Airdrop Delivery System bundles/platforms are GPS—guided loads that use wind drop sondes before the cargo drop to get a more accurate in-flight CARP. JPADS are usually dropped only from high altitudes.

Jumpmaster—The assigned airborne-qualified individual who controls parachutists from the time they enter the aircraft until they exit.

Knock-it-Off—A term any crew member may call 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 flight controls to a normal configuration.

Last Suitable Airfield (LSAF)—The last suitable airfield available before beginning the Category I route segment.

Latest Descent Point—Latest planned point on the DZ run-in course where the formation plans to initiate descent to drop altitude. This is planned to ensure all aircraft in the formation are stabilized (on altitude and airspeed) prior to the drop.

L-Band SATCOM—600 BPS satellite communications (SATCOM) system contracted through the International Maritime Satellite Organization (INMARSAT), used primarily for command and control. The system consists of a satellite transceiver, a laptop computer, and a printer.

Lead Crew—A crew consisting of a lead qualified aircraft commander and a lead qualified navigator.

Loading Time—In airlift operations, a specified time, established jointly by the airlift and airborne commanders concerned, when aircraft and loads are available and loading is to begin.

Local Training Mission—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation and executed at the local level.

Maintenance Status:—

A-1—No maintenance required.

A-2 (Plus Noun)—Minor maintenance required, but not serious enough to cause delay. Add nouns that identify the affected units or systems, i.e. hydraulic, ultra high frequency (UHF) radio, radar, engine, fuel control, generator, etc. Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel will be available to meet the aircraft. When possible, identify system as mission essential (ME) or mission contributing (MC).

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

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

Manual gate cut.—A manual gate cut is defined as the loadmaster using a knife to physically cut/release the CDS/intermediate gates.

Medical Crew Director (MCD)—A qualified Flight Nurse (FN) responsible for supervising patient care and AECMs assigned to AE missions. On missions where an FN is not onboard, the senior AET will function as MCD.

Mission—1. The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore. 2. In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. 3. The dispatching of one or more aircraft to accomplish one particular task.

Mission Advisory—Message dispatched by command and control agencies, liaison officers, or aircraft commanders advising all interested agencies of any changes in status affecting the mission.

Mission Contributing (MC)—Any degraded component, system, or subsystem which is desired, but not essential to mission accomplishment

Mission Essential (ME)—An degraded component, system, or subsystem which is essential for safe aircraft operation or mission completion

Mobility Air Force (MAF)—Forces assigned to mobility aircraft or MAJCOMs with operational or tactical control of mobility aircraft.

Modified Contour—Flight in reference to base altitude above the terrain with momentary deviations above and below the base altitude for terrain depressions and obstructions to permit a smooth flight profile.

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.

Normal Cruise Fuel Flow (NCFF).—The fuel flow rate used when computing CAT I fuels reserves. It is derived from the fuel flow rate on your MDPT leg in CFPS.

Off Station Training Flight—A training flight that originates or terminates at other than home station that is specifically generated to provide the aircrew experience in operating away from home station. Off station trainers will not be generated solely to transport passengers, cargo, or position/deposition crewmembers.

Operational Control (OPCON)—Transferable command authority that may be exercised by commanders at any echelon at or bellow 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.

Operational Missions. —Missions executed at or above 618 TACC or theater C2 agency level. Operational missions termed "CLOSE WATCH" include CORONET missions and priority 1, 2, and 3 missions tasked by the 618 TACC or theater C2 agency. Other operational missions such as deployment, re-deployment, reconnaissance operations, operational readiness inspections (ORI), AMC-directed channel or SAAM, and JA/ATT missions may be designated "CLOSE WATCH" as necessary.

Opportune Airlift—Transportation of personnel, cargo, or both aboard aircraft with no expenditure of additional flying hours to support the airlift.

Originating Station—Base from which an aircraft starts on an assigned mission. May or may not be the home station of the aircraft.

Operational Risk Management (ORM)—A logic-based, common sense approach to making calculated decisions on human, materiel, and environmental factors before, during, and after Air Force operations. It enables commanders, functional managers and supervisors to maximize operational capabilities while minimizing risks by applying a simple, systematic process appropriate for all personnel and Air Force functions.

Overwater Flight—Any flight that exceeds power off gliding distance from land.

Patient Movement Categories—

Urgent—Patients who must be moved immediately to save life, limb, or eyesight, or to prevent complication of a serious illness.

Priority—Patients requiring prompt medical care that must be moved within 24 hours.

Required Ramp Fuel Load (RRFL).—The minimum fuel required at engine start to complete the tasked mission.

Routine—Patients who should be picked up within 72 hours and moved on routine/scheduled flights.

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, i.e. number of crew and passengers, cargo not yet cleared. PICs are responsible to deliver the permit to proceed to the customs inspector at the base where final clearance is performed. (Heavy monetary fines can be imposed on the PIC for not complying with permit to proceed procedures.)

Point Of No Return—A point along an aircraft track beyond which its endurance will not permit return to its own or some other associated base on its own fuel supply.

Point of Safe Return—Most distant point along the planned route from which an aircraft may safely return to its point of departure or alternate airport with required fuel reserve.

Positioning and De-Positioning Missions—Positioning missions are performed to relocate aircraft for the purpose of conducting a mission. De-positioning missions are made to return aircraft from bases at which missions have terminated.

Quick Stop—Set of procedures designed to expedite the movement of selected missions by reducing ground times at en route or turnaround stations.

Ramp Coordinator—Designated representative of the C2 whose primary duty is the coordination of ground handling activities on the ramp during large scale operations.

Scheduled Return Date (SRD)—Scheduling tool used by air mobility units to predict when crews will return to home station. It allows force managers to plan aircrew availability and provide crews visibility over monthly flying activities. AMC and AMCgained aircrews (except those on standby at home station) will have an SRT established on their flight orders.

Scheduled Takeoff Time—Takeoff time is established in the schedule or OPORD. For air aborts and diversions, this will be engine shut down time (or arrival in the blocks if engine shutdown is not scheduled) plus authorized ground time. Early deviation does not apply to aborts or diversions unless the mission is formally rescheduled by current operations.

Section—Subdivision of a formation. A section normally consists of 6 aircraft (2 elements).

Serial—Normally consists of 12 aircraft (2 sections or 4 elements).

Significant Meteorological Information (SIGMET)—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, severe and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Special Assignment Airlift Mission (SAAM)—Funded airlift that cannot be supported by channel missions because of the unusual nature, sensitivity, or urgency of the cargo, or that requires operations to points other than the established channel structure.

Special Tactics Team (STT)—A task-organized element of special tactics that may include combat control, pararescue, and combat weather personnel. Functions include austere airfield and assault zone reconnaissance, surveillance, establishment, and terminal control; terminal attack control; combat search and rescue; combat casualty care and evacuation staging; and tactical weather observations and forecasting.

Stabilization Point—Point on the DZ run-in course at which the lead aircraft should plan to be stabilized at drop altitude and airspeed. This point will be planned to be at least 6 NMs prior to the point of impact.

Station Time—In air transport operations, the time at which crews, passengers, and cargo are to be on board and ready for the flight.

Suitable Airfield—Normally, suitable airfields are those which meet C-130 weather, fuel, and runway requirements (**Chapter 6**) and are within 50 NM of flight plan course centerline.

Supplemental Training Mission (STM)—Opportune airlift of cargo and mission personnel may be accomplished as a by-product of crew training missions. STMs may be authorized when minor adjustments can be made to a scheduled training mission or when a productive aircrew training mission can be generated for the airlift. The training mission will not be degraded in any manner to accomplish the STM. Use of STMs for logistical support will be authorized only when normal military or commercial transportation modes are unable to provide required support. STMs may be approved by the operations group commander. On STMs PICs will release maximum number of space available seats commensurate with mission requirements and safety.

Tactical Event—Airdrop, low level, formation, assault landings/takeoffs, tactical approaches/departures, landings to an AMP 3 configured airfield at night.

Tanker Airlift Control Center (18 AF TACC)—The 18th Air Force direct reporting unit responsible for tasking and controlling operational missions for all activities involving forces supporting US Transportation Command's global air mobility mission. The 18 AF TACC contains the following functions: Command and Control, Current Operations, Mission Support, Logistics Operations Center, Aerial Port Control Center, Flight Planning, Diplomatic Clearance, Weather, and Mission Support Planning Office. Also called 18 AF TACC.

Tankered Fuel—Additional fuel carried through a primary destination for use on a subsequent leg.

Terminal Fuel Flow (TFF)—The fuel flow rate expected during the last hour at cruise altitude. TFF is the fuel flow found on the last leg of a CFPS flight plan.

Theater Patient Movement Requirements Center (TPMRC)—Responsible for the coordination and requirements for patient movement from communication zone to CONUS.

Time Out—Common assertive statement used to voice crewmember concern when safety may be jeopardized.

Training Mission—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. Does not include operational missions as defined in this AFI.

Transportation Working Capital Fund (TWCF)—Formerly known as Defense Business Operations Fund-Transportation (DBOF-T). TWCF is part of the Air Force Working Capital Fund (AFWCF). Normally, TWCF funds are used for costs that can be recovered from an air mobility customer. Examples include: TDY costs, site surveys of CRG or airlift unit deployment beddown locations, airlift unit level mission planning expenses, and support or contract costs for deployed TWCF units/personnel.

Unilateral—Operations confined to a single service.

Unit Move—A mission airlifting military passengers or troops who originate from the same unit and on-load point, are under the control of a designated troop commander and off-load at the same destination.

Wing Relieving Fuel (WRF)—Additional Fuel kept in the main tanks intended to counter wing bending moments.

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.