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Flying Operations
FLIGHT TEST OPERATIONS PROCEDURES

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This instruction implements AFD 11-2, *Aircraft Rules and Procedures*; AFD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. It applies to all AFMC units, AFRC units under AFMC OPCON, and AFMC gained units and personnel conducting flying operations. Attachments to this instruction prescribe Mission Design Series (MDS) specific operating procedures. Units will maintain all applicable attachments for assigned/possessed aircraft. Field units below MAJCOM level will forward copies of their proposed supplements to this publication to AFMC/DOV for review and approval. Keep supplements current by complying with AFI 33-360V1, *Publications Management Program*. See paragraph 1.2 of this instruction for guidance on submitting comments and suggesting improvements to this publication. Records Disposition. Maintain and dispose of all records as a result of processes and prescribed by this instruction IAW AFMAN 37-139, *Records Disposition Schedule*. This instruction is affected by the Paperwork Reduction Act as amended in 1996.

★SUMMARY OF REVISIONS

This page change corrects administrative errors on pages 1, 76, 94, 140, 141, 174, 192, 225 and 228 of the latest version.

POSTING INSTRUCTIONS: This is a page-for-page change. Users should print Change 1 using duplex head-to-head printer settings and replace current pages 1, 2, 75, 76, 93, 94, 139, 140, 141, 142, 173, 174, 191, 192, 225, 226, 227, and 228 with Change 1.

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Table A4.1. Operating Limitations.

Event	Restriction
SCAS Off Landing	Prohibited (Sim only)
Simulated Engine Failure Touch & Go / Landing / Low Approach	Prohibited (Sim only)
25 Wing Approach notes 1,2,3	<ol style="list-style-type: none"> 1. 250,000 lbs. Maximum 2. IP on Board 3. Touch & Go or Low Approach Only
Slat Only Approach Notes 1,2,3	<ol style="list-style-type: none"> 1. 230,000 lbs. Maximum 2. IP on Board 3. Touch & Go or Low Approach Only
Partial Flap Approach Notes 1,2,3	<ol style="list-style-type: none"> 1. 250,000 lbs. Maximum 2. IP on Board 3. Touch & Go or Low Approach Only
No-Flap Approach Notes 1,2,3	<ol style="list-style-type: none"> 1. 250,000 lbs. Maximum 2. Touch & Go or Low Approach Only
Normal Approach	<ol style="list-style-type: none"> 1. Authorized to approach minimums 2. Min RCR = 9 3. Crosswind = tech order limits 4. 300,000 lbs. Maximum for Full Stops and Touch & Go

All simulated emergency procedures require: 1) Wx (1000-2) or circling minimums whichever is higher, 2) Dry runway 3) 15 knot maximum crosswind component.

ATTACHMENT 5

B-2 OPERATING PROCEDURES**Section A5A— General Information**

★**A5.1. Scope.** This attachment, in conjunction with other governing directives, outlines procedures for operation of the B-2 aircraft under most circumstances. It applies to AFMC aircrews and all management levels concerned with operation of B-2 aircraft. For operating procedures not specifically addressed in this attachment, users will refer to AFI 11-2B-2 Volume 3, *B-2 Operating Procedures*. Where the applicable lead-command guidance is incompatible with unit operations, contact AFMC/DOV for resolution. Operations or procedures not specifically addressed may be accomplished if they enhance safe, effective mission accomplishment

Section A5B— Operating Procedures

A5.2. Preflight. For normal training missions, preflight should start one hour thirty minutes prior to scheduled takeoff. Test mission pre-flights will be performed as required. Ensure all FLIP and classified materials are present, current, and complete.

A5.3. Taxi. Minimum taxi interval is 500 feet in trail. Do not taxi the aircraft with a reported RCR of 6 or less anywhere on the taxi route.

A5.4. Takeoff/Departure.

A5.4.1. Unless a flight test requirement exists, do not takeoff under any of the following conditions:

A5.4.1.1. If the RCR is reported less than 9.

A5.4.1.2. Standing or pooled water on the runway.

A5.4.1.3. If the computed takeoff roll exceeds 80% of the available runway.

A5.4.1.4. Any attitude indicator, heading indicator, or pitot-static instrument inoperative.

A5.4.1.5. One or more engines inoperative from start of takeoff roll.

NOTE: During emergency evacuations, launch of aircraft with one or more engines inoperative may be accomplished with AFMC/DO approval. At no time will launch be directed when computed takeoff distance exceeds 95 percent of runway available.

A5.4.2. Intersection takeoffs must provide at least the minimum runway length specified in chapter 2.

A5.4.3. Instrument Approach Category. The B-2A is designated as an approach category "D" aircraft. If a case exists where airspeed for circling approaches exceeds 166 knots, use category "E" minima.

A5.4.4. Chase Procedures. A safety chase is not required for proficiency training flights. A safety/photo chase will be used as required on test flights per the approved safety package.

ATTACHMENT 8

C-5 OPERATING PROCEDURES

Section A8A— *Introduction*

A8.1. Scope. This attachment, in conjunction with other governing directives, outlines procedures for operation of the C-5 aircraft under most circumstances. It applies to AFMC aircrews and all management levels concerned with operation of C-5 aircraft. For operating procedures not specifically addressed in this attachment, users will refer to AFI 11-2C-5 Volume 3, *C-5 Operating Procedures*. Where the applicable lead-command guidance is incompatible with unit operations, contact AFMC/DOV for resolution. Operations or procedures not specifically addressed may be accomplished if they enhance safe, effective mission accomplishment.

Section A8B— *Mission Planning*

A8.2. Obstacle Clearance Planning.

A8.2.1. Obstacle Identification Surface (OIS). Obstacle identification for SID purposes (FAA Handbook 8260.3B, AFJMAN 11-226, *US Standard for Terminal Instrument Procedures (TERPS)*) are those objects that penetrate an OIS of 40:1 (152 ft/NM), starting at the required DER height (if any). Calculation of the OIS on a SID continues until the SID reaches an MEA or until the SID terminates. Climb gradients of 200 ft/NM will provide at least 48 ft/NM clearance above all obstacles that do not penetrate the OIS. Complying with published climb gradients found on a SID or IFR departure procedure will provide at least 48 ft/NM clearance above all obstacles that do penetrate the OIS. The aircraft commander must be aware and thoroughly brief all significant obstacles along the departure flight path.

A8.2.1.1. If no obstacles penetrate the 152 ft/NM slope, IFR departure procedures are not published.

A8.2.1.2. If obstacles do penetrate the slope, avoidance procedures are specified. These procedures may be: a climb gradient greater than 200 ft/NM; detailed flight maneuvers; a ceiling and visibility to allow obstacles to be seen and avoided; or a combination of the above. In extreme cases, IFR takeoff may not be authorized for some runways. Aircrews will not use any departure procedure that requires a certain ceiling and visibility to see and avoid an obstacle.

A8.2.1.3. Climb gradients are specified when required for obstacle clearance. Crossing restrictions in the SID's may be established for traffic separation or obstacle clearance. When no gradient is specified the pilot is expected to climb at least 200 ft/NM to the MEA, unless required to level off by a crossing restriction.

A8.2.1.4. Climb gradients may be specified to an altitude/fix, after which the normal climb gradient applies.

A8.2.1.5. The Airfield Suitability and Restrictions Report (ASRR) is an excellent source for obstacle information. However, it is not a stand-alone document. It is intended to supplement published climb gradients and obstacle information found on SIDs and Published IFR Departure Procedures.

A8.2.2. Objects penetrating the OIS may or may not be depicted (they definitely will not be depicted on civil procedures). Objects that do not penetrate the OIS will not normally be depicted.

A8.2.3. SIDs simplify ATC procedures while providing safe routing to the en route structure, but should not be used as the sole source of obstacle information for departure planning. If SIDs are used as such, inadequate engine out obstacle clearance may result. SIDs, Instrument Departure procedures and instrument approach plates, should be used to determine the distance and height values for all significant obstacles along the flight path.

A8.2.4. The controlling obstacle is defined as the obstacle requiring the greatest climb gradient within the flight path. The gradient is measured from the end of the runway not CFL. Obstacles are not normally depicted on SIDs when climb gradients of less than 152 ft/NM are required to clear them.

A8.2.5. In order to fly any departure, aircrews must ensure they can meet the published/required climb gradient with all engines operating (200 ft/NM if none published/required). If the aircraft is not capable of meeting an ATC all engine climb gradient restriction, ATC coordination is required prior to takeoff. In addition, aircrews will accomplish the following to ensure they can vertically clear all obstacles on or reasonably near the climb out/emergency return flight path with one engine inoperative:

A8.2.5.1. If both climb gradient and obstacle data is known: The aircraft must be able to achieve the published climb gradient (for the runway to be used) with all engines operating. The aircraft must also be able to vertically clear all obstacles within the climb out flight path with one engine inoperative.

A8.2.5.2. If only obstacle information is available: The aircraft must be capable of maintaining a minimum climb gradient of 200 ft/NM with all engines operating and be able to vertically clear all obstacles within the climb out flight path with one engine inoperative.

A8.2.5.3. If only climb gradient information is available. Ensure that the aircraft can maintain that climb gradient with all engines operating. For engine out computations:

★If the required gradient is 200 ft/NM: the computed climb out factor (COF) should be equal or less than 71.

If the required climb gradient is greater than 200 ft/NM:

Step 1. Determine the distance the climb gradient needs to be maintained. If the climb gradient is to be maintained to a certain fix, measure the distance to the fix. If the climb rate is to be maintained until a certain height above MSL, then subtract the take off zone elevation from that height. Divide the result by the climb gradient. This will yield the distance in NM from the runway. (Example: Take off zone elevation 500 ft MSL climb gradient 250 ft/NM until 1250 ft MSL $1250-500=750$ $750/250=3$ NM from the runway.)

Step 2. Multiply the climb gradient from Step 1 by the distance from Step 1 to compute an effective obstacle height clearance (AGL) for the climb gradient. (Example $250 \times 3 = 750$ ft AGL)

Step 3. Use the normal obstacle procedures (T.O. 1C-5A-1-1, Fig A3-15 or A3-16, as applicable) to compute whether you can clear that obstacle with an engine out.

compartment, one forward and one aft for takeoffs and landings. Qualified crewmembers may perform these duties on missions where 15 passengers or less are carried, and cargo weight does not exceed 500 pounds.

4. Only one loadmaster is required for airdrop missions if:

- a) Using only one paratroop door for personnel or door bundle (less than 100 lbs.) drops.
- b) High altitude (up to 13,000 feet MSL) non-static line personnel are dropped from the ramp and door or, only one paratroop door is opened.
- c) Dropping only simulated airdrop training bundles (SATBs).
- d) A no-drop (dry pass) is planned and ground time is sufficient to permit on-load or offload by one loadmaster.

A11.4. Crew Duty Day. Observe restrictions and guidance of AFI 11-202 Vol. 3 and this instruction and the following: Limit crew day to 12 hours with an inoperative autopilot. If the autopilot fails after departure, continue to the next scheduled stop and then comply with the 12-hour duty limitation. Engines Running On-load/Offload (ERO) are not limited in the three-sortie maximum.

Section A11C— *Basic Operating Restrictions*

A11.5. Runway and Taxiway Minimums. Minimum dimensions for aircraft operations are shown in Table A11.2.

Table A11.2. Minimum Dimensions.

Parameter:	Requirement:
Minimum Taxiway width:	30 ft
Minimum Runway width:	80 ft for normal ops. 60 ft for assaults
Minimum runway length for Normal takeoff:	Critical field length, or IAW Table 2.1, whichever is longer.
Minimum runway length for Normal landing:	Landing distance from 50 ft over the threshold, plus 500 ft* *For RVR(Vis.) less than 4000m (3/4 mile): Add 1000 ft to ldg. distance
Minimum runway length for Assault Landing:	Ground roll plus 500 ft, but not less than 3000 ft Compute landing performance with two engines in reverse, two engines in ground idle, and full brakes
Minimum runway length for Assault Takeoff:	Charted MFLMETO (corrected for one-engine V _{ca} , if applicable), but not less than 3000 ft. Takeoff at V _{ca} in ground effect or V _{meto} , whichever is greater, unless actual obstacles are a factor V _{ca} corrections may be disregarded while conducting approved test plan operations

A11.5.1. Operations over Runway cables:

A11.5.1.1. Do not land on (touchdown on) approach end arresting cables (does not include recessed cables). If the aircraft lands before the cable, contact the tower to have the cable inspected.

A11.5.1.2. 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.

A11.5.1.3. Operations are authorized on runways where BAK-12 systems are installed, with an eight-point cable tie-down system, without regard to the Dash-One Caution. When operating from runways equipped with other types of systems, or if it is unknown if the BAK-12 system includes eight point tie-downs, aircrews should recognize the increased risk of damage to the aircraft.

A11.6. Departure Planning: Use AFI 11-202V3, AFMAN 11-217 and this instruction when planning an IFR departure.

A11.6.1. IFR Departures

★A11.6.1.1. Takeoff gross weight (GW) must not exceed that which would, in the event of an engine failure, lower the rate of climb to less than a 3.3 percent climb gradient (200 ft/nm).

A11.6.1.2. Critical Field Length (CFL). Takeoff GW must never exceed that which would require CFL in excess of the runway available for a normal takeoff. Runway available must exceed CFL by at least 50 feet for every 1-foot of altitude required at the departure end of the runway (screen height). Required screen heights depend on the agency that wrote the standard instrument departure (SID)

A11.6.1.3. If unable to determine the DER altitude required, use 35 feet for planning purposes.

★A11.6.1.4. If no minimum climb gradient is published, use 200 ft/NM with all engines operating and with one engine inoperative. If a higher climb gradient is published or required for radar vectors, use that climb gradient as the minimum with all engines operating and with one engine inoperative. If the departure airfield does not have an instrument approach, then an obstacle survey has not been completed. Therefore an IFR departure is not authorized. If the published IFR departure procedure does not include either routing or a minimum climb gradient (weather mins. only) then an IFR departure using those procedures is not authorized.

A11.6.1.5. If the airport does not have an authorized IFR departure method, the weather at takeoff must permit a VFR climb to an IFR MEA, an appropriate IFR cruising altitude, or an altitude where radar vectors can be provided.

A11.6.2. VFR Departures. VFR Departures will not be flown in lieu of proper obstacle clearance planning.

A11.6.2.1. VFR departures require detailed planning to ensure obstacles and high terrain is avoided. Conduct VFR operations only when required for mission accomplishment

A11.6.2.2. The minimum climb gradient on four engines must ensure obstacles clearance along the planned departure route.

A11.6.2.3. Engine-out climb gradient capability ensures that in the event of an engine failure, the planned departure or emergency return route provides obstacle avoidance. Even when obstacles are not a factor, the aircraft must be capable of climbing at a rate of at least 200 feet per minute on three engines at obstacle clearance speed.

Section A11D— Normal Procedures

A11.7. Personal Equipment Requirements.

A11.7.1. Helmets and Oxygen Masks. Carry a personal helmet and oxygen mask anytime parachutes are required aboard the aircraft (to avoid head injuries during bailout)

A11.8. Cockpit Congestion and Loose Objects.

A11.8.1. During the flight, the number of persons on the flight deck will be the minimum commensurate with mission requirements.

A11.8.2. Ensure helmet bags and other personal gear is properly stowed to prevent obstruction of egress routes during emergencies.

A11.9. Duty Station. Only one pilot, or the flight engineer, may be absent from their duty station at a time. Notify the aircraft commander prior to departing assigned duty station.

A11.10. Flight Deck Access. Aircraft commanders may authorize passengers access to the flight station during any phase of flight. Passengers will not be permitted access to any pilot position.

A11.11. Takeoff and Landing Policy. The pilot in command will occupy either the left or right seat during all takeoffs, landings, and critical phases of flight. Instructor pilots may takeoff or land from either seat.

A11.11.1. An instructor qualified pilot or aircraft commander will make all takeoffs and landings during:

A11.11.1.1. Aircraft emergencies.

A11.11.1.2. Assault or substandard airfield operations. EXCEPTION: Instructors providing upgrade training, receiving an evaluation, gaining currency, or proficiency.

A11.11.1.3. Situations when in the opinion of the aircraft commander, marginal conditions exist.

A11.12. Outside Observer. When available, use a crewmember to assist in outside clearing any time the aircraft is below 10,000 feet MSL and during all taxi operations.

A11.13. Aircraft Lighting.

A11.13.1. Unless otherwise directed the aircraft strobe lights will be operated as follows:

A11.13.1.1. "Before Starting Engines" Checklist, "red" position.

A11.13.1.2. "Lineup" Checklist, "white" for day, night single-ship, and day formation. "red" for night formation.

A11.13.1.3. "After Landing" Checklist, "red" position.

A11.14. Advisory Calls. C-130 crews will use the guidance below versus that listed in 11-2FT Vol. 3. The pilot flying will periodically announce intentions during departure, arrivals, approaches, and when circumstances require deviating from normal procedures. Mandatory advisory calls are: (The pilot not flying the aircraft will make these calls except those designated for any crewmember).

A11.14.1. 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.

A11.14.2. Altitude calls:

A11.14.2.1. 1000 feet above initial approach fix (IAF) (or holding) altitude

A11.14.2.2. Transition altitude/level.

A11.14.2.3. 1000 feet above/below assigned altitude.

A11.14.2.4. 100 feet above/below assigned altitude to include minimum descent altitude/decision height (MDA/DH).

A11.14.3. Approaches:

A11.14.3.1. Call 100 feet above procedure turn, final approach fix (FAF), MDA, or DH altitude.

A11.14.3.2. Non-precision approaches.

A12.14.4. All primary aircraft systems not associated with the failed engine must be fully operational.

A12.14.5. Performance data must satisfy takeoff field length requirements, gear down 3-engine climb performance, and final segment two-engine asymmetric go-around capability.

A12.14.6. Download cargo (including mission support kits) prior to ferry operations.

A12.15. Power Management Control (PMC) Operations. The pilot in command may (authorize) takeoff with one PMC inoperative. Do not turn off an operational PMC to practice a PMC inoperative takeoff. Simulated three-engine approaches and touch-and-go landings are not authorized with a PMC inoperative.

A12.16. Flight Maneuvers. The following maneuvers are authorized for qualification and continuation training. They are applicable to all mission and series C-135 aircraft, except when prohibited or restricted by the flight manual, partial/modification flight manual or other current directives. Direct instructor-pilot (IP) super-vision requires the IP to have immediate access to the controls. Comply with Training Restrictions in Table 9.2 of this instruction and the following:

A12.16.1. Simulated Engine Failure. Perform practice or simulated loss of engines IAW this instruction, the applicable flight manual.

A12.16.2. Approach and Landing, Simulated Engine-Out (direct IP supervision).

A12.16.3. Approach and Go-Around, Simulated Engine-Out (Power Rudder On). A planned three-engine go-around may be started at any time before the power is reduced in the flare. For an unplanned go-around use all four engines as soon as safe and practical

A12.16.4. Approach and Go-Around, Simulated Engine-Out (Power Rudder Off) (direct IP supervision). This maneuver will not be accomplished unless an IP has briefed the maneuver prior to flight. The go-around will be started no lower than 200 AGL. For an unplanned go-around, use all four engines as soon as safe and practical.

A12.16.5. Simulated Engine Failure Takeoff Continued

A12.16.6. Simulated 2-Engine Approach/Landing (direct IP supervision). May be practiced using two symmetric engines or three engines using two-engine procedures. Two-engine approaches and landings will not be practiced in an extensively modified aircraft.

A12.16.7. Simulated Jammed Stabilizer Demonstration (spoiler use only) (direct IP supervision)

A12.16.8. Landing Attitude Demonstration (IP supervised)

A12.16.9. Spoiler/Lateral Control Demonstration (IP supervised).

A12.16.10. Trim Demonstration (IP supervised).

A12.17. Touch-and-Go Landing Limitations

A12.17.1. Touch and Go landings may be performed under direct instructor pilot supervision or by a certified mission pilot IAW this instruction, AFI 11-2FTV1, and the applicable flight manual. Refer to AFI 11-2FT Vol. 1 as supplemented for specific touch and go training requirements, restrictions and approved airfields (without IP).

A12.17.2. Touch-and-go landings with passengers are prohibited. Civilian employees under direct contract to the DoD and MAJCOM approved maintenance personnel engaged in official direct mission support activities are considered mission essential and may be onboard when touch-and-go landings are performed under MEGP status.

A12.17.3. Brief touch-and-go landing considerations with the other appropriate aircrew members prior to final approach. On successive approaches, if the briefing remains the same and there are no questions, the briefing need not be repeated.

A12.18 Prohibited maneuvers. The following maneuvers, in addition to those already specified in applicable flight manuals, are prohibited unless part of an approved test plan, USAF TPS curriculum, FCF profile, or an actual emergency exists.

A12.18.1. Stalls

A12.18.2. Initial Buffet

A12.18.3. Dutch Roll

A12.18.4. Emergency Descent

A12.18.5. Simulated 3 engine, rudder power-off landings

A12.18.6. Compound Emergencies (except simulated engine-out with rudder power or EFAS off).

A12.18.7. Takeoffs and landings with the EFAS off.

A12.18.8. Actual practice engine shutdown.

A12.19 Operating Limitations. Unless specifically authorized elsewhere in this section, do not practice emergency procedures that degrade aircraft performance or flight control capabilities (in-flight).

A12.19.1. In-flight, prior to simulating emergency procedures (EP), the pilot will notify all crewmembers.

A12.19.2. In the event of an actual emergency, all student training and simulated EPs will be terminated. Training will resume only when the pilot in command has determined that no hazard to safe aircraft operations exist.

A12.19.3. Rudder power will be on for all takeoffs and landings. The EFAS will be on for all C/KC-135R/T takeoffs and landings.

★A12.19.4. Do not practice traffic pattern operations, instrument approaches, low approaches or go-around at gross weights that will not afford a minimum of 500 feet per minute rate of climb at approach speed, three engines, flaps-30, gear-up (gear-down for emergency procedures practice). For the C/KC-135R/T, a minimum of a 3.3% (200ft/nm) climb gradient at touchdown speed, three engines, planned flap setting, gear-down.

A12.20. Landing Limitations. The following landing limitations apply to both touch-and-go and full stop landings:

A12.20.1 Gross weight. Landing gross weights will be at a gross weight that will permit a safe, full stop landing in the runway available. At gross weights above 200,000 pounds pilot will brief and comply with flight manual sink rate limitations.

Section A15C— Normal Operating & Formation Procedures

A15.6. Ground Visual Signals. Refer to AFI 11-218 and appropriate phase manuals for ground visual signals.

A15.6.1. Target POD Clear. Extend arm and rotate a closed fist in a circular motion.

A15.7. Takeoff:

A15.7.1. Do not takeoff if the RCR is less than 12.

A15.7.2. If the computed military power takeoff distance exceeds one-half of the available runway, takeoff using afterburner.

A15.8. Join-Up/Rejoin:

A15.8.1. Flight leaders will maintain 350 KCAS until join-up is accomplished unless mission requirements necessitate a different airspeed.

A15.8.2. Flight leads will normally direct a battle damage/bomb check after each mission prior to Return to Base (RTB). Brief deconfliction responsibilities and position change procedures.

A15.9. Tactical Formation:

A15.9.1. Wingmen/trail elements will cross above the lead/lead element when deconfliction is required during tactical maneuvering.

A15.9.2. De-confliction Responsibilities. The wingman is responsible for flight path deconfliction during tactical maneuvering unless he calls "Padlocked", "Blind", or "Engaged" and flight lead acknowledges.

A15.10. Maneuvering Parameters:

A15.10.1. Minimum altitude for nose high/low speed recoveries and Aircraft handling Characteristics (AHC) vertical maneuvers is 10,000 feet AGL.

A15.10.2. Remain above 5,000 feet AGL during all aerobatics maneuvering.

A15.11. Radio Procedures. Use brevity code and other terminology IAW AFI 11-214, AFTTP 3-1V1, and local standards.

A15.12. Low Altitude Procedures:

A15.12.1. Fly low level formation positions/tactics using AFTTP 3-1V4, AFTTP 3-1V17, AFTTP 3-3V4, and AFTTP 3-3V17, as guides.

A15.12.1.1. Line abreast formation is authorized at or above 300 feet AGL. When flying below 300 feet AGL, direct the wingman to a wedge formation position.

A15.12.2. Obstacles:

A15.12.2.1. All obstacle avoidance planning will be based on Minimum Safe Altitude (MSA) and Route Abort Altitude (RAA).

A15.12.2.2. Flight leads will direct a climb not later than (NLT) 3 NM prior to an obstacle if unable to visually acquire or ensure lateral separation from that obstruction.

★A15.12.3. Minimum Airspeed. The minimum airspeed for low level navigation is 300 KCAS.

A15.12.4. For night or IMC operation the minimum altitude is 1000 feet above the highest obstacle within 5 NM of course unless operating under the conditions of paragraph 3.19, LANTIRN Operations.

A15.12.5. For over water operation the minimum altitude is 1000 feet above the surface unless in sight of land or using TF fly-up protection. If in sight of land or using TF fly-up protection the minimum altitude may be lowered to 500 feet above the surface.

A15.12.6. For Air to Surface range operations min altitudes will be determined by Range restrictions, AFI 11-214 restrictions, or aircrew minimums, whichever is greater.

A15.12.7. Visual Meteorological Conditions (VMC) Route/Area Abort Procedures. Comply with VFR altitude restrictions, maintain VMC and squawk applicable (IFF/SIF) modes and codes. Attempt contact with controlling agency, if required.

A15.12.8. IMC Route/Area Abort Procedures. Immediately climb to, or above, the briefed RAA and maintain preplanned ground track. Execute appropriate lost wingman procedures if necessary. If deviations from normal route/area procedures are required, or if the RAA/MSA is higher than the vertical limits of the route/area, squawk (IFF/SIF) emergency. Attempt contact with the appropriate ATC agency for an Instrument Flight Rules (IFR) clearance. If required to fly in IMC without an IFR clearance, cruise at appropriate VFR altitudes until IFR clearance is received.

A15.13. LANTIRN Operations:

A15.13.1. An operational LANTIRN system is required to conduct night or day IMC low level operations below MSA.

A15.13.2. Unarmed TF operations in IMC are prohibited.

A15.13.3. Each crew will confirm by inter-cockpit communication that the TFR and radar altimeter are on and working properly before descending below the MSA.

A15.13.4. Any maneuvering that will put the aircraft outside of TFR limits, negating fly-up protection, will be at or above the applicable MSA or RAA.

A15.13.5. Abnormal Operation. If NAV FLIR visibility is insufficient for use as an aid for terrain avoidance (N/A for IMC TF qualified crews using IMC procedures on an IFR Route (IR) route) climb to MSA/RAA.

A15.14. Approaches and Landings:

A15.14.1. The desired touchdown point for a VFR approach is 500 feet from the threshold or the glide path interception point for a precision approach.

A15.14.2. Landing Restrictions:

A15.14.2.1. When the computed landing roll exceeds 80 percent of the available runway, land at an alternate if possible.

A21.6. Weather Minimums:

A21.6.1. Operational Minimums.

★A21.6.1.1. VFR. In compliance with AFI 11-202 Vol 3.

A21.6.1.2. IFR - Compatible approach minimums or suitable departure alternate within 60 minutes flying time, with aircraft capable of flying at minimum enroute altitudes single-engine.

A21.6.2. Training Missions.

A21.6.2.1. VFR - 1000 foot ceiling/ 3 mile visibility.

★A21.6.2.2. IFR - Compatible approach minimums or suitable departure alternate within 60 minutes flying time, with aircraft capable of flying at minimum enroute altitudes single-engine.

A21.7. Wind Limitations:

A21.7.1. Operational - 45 knots peak wind. May be waived with DFO approval on a case- by-case basis but flight manual limits still apply on rotor starting/ stopping.

A21.7.2. Training - 30 knots peak wind.

Section A21D—Aircrew Procedures

A21.8. Ground Operations:

A21.8.1. Engine-running crew changes require the following. One pilot will have seat belt and shoulder harness fastened during pilot change, the new aircraft commander will review aircraft weight and balance and configuration, and current takeoff and landing data must be computed.

A21.8.2. Engine Start and Rotor Engagement. Crew must be alert at all times for vehicles and personnel.

A21.8.3. Taxi and Hover. Pilots must exercise caution when operating in areas having partially prepared surfaces and/or loose objects that may be picked up by the rotor downwash:

A21.8.3.1. Caution must be used when taxiing in the vicinity of light aircraft to prevent damage caused by rotor wash.

A21.8.3.2. The helicopter is susceptible to adverse effects from the rotor/propeller/jet wash of heavier aircraft. Therefore, avoid the propeller/jet wash of any aircraft that is preparing for a pretakeoff runup check.

A21.9. Predeparture:

A21.9.1. Prior to departing from an airfield with marginal weather conditions, or if IMC flight is expected, the aircraft commander will complete an instrument cockpit check and brief the appropriate instrument approach for emergency IFR return.

A21.10. En Route:

A21.10.1. Forced or Precautionary Landings. Aircraft commanders must consider a precautionary landing as an option when mechanical malfunctions or deteriorating weather interfere with mission accomplishment. The following procedures apply to all forced and precautionary landings:

A21.10.1.1. Make every effort to notify a controlling agency (i. e., declare an emergency if necessary IAW FLIP guidance) before making a forced or precautionary landing (time permitting).

A21.10.1.2.. Every effort will be made to contact the SOF (ground- to- ground/ ground- to- air/telephone) once the aircraft is safely on the ground.

A21.10.1.3. For precautionary landings due to deteriorating weather, the flight may be continued at the discretion of the aircraft commander.

A21.10.1.4. For actual, impending, or potential malfunctions, corrective action will be completed before continuing flight and DFO approval must be received prior to continuing flight. If contact cannot be established and if the aircraft commander determines it is potentially more hazardous to await maintenance assistance, he/ she may continue the flight to the nearest suitable area if the aircraft commander determines flight manual actions have corrected the malfunction.

Section A21E—FE Procedures

A21.11. General. This section contains normal procedures for FEs not contained in the flight manual and/ or applicable TOs.

A21.12. Authority to Clear a "Red X." If a situation is encountered where the aircraft is on Red X and qualified maintenance personnel are not available, the home station chief of maintenance may authorize the FE to clear a Red X.

A21.13. Refueling/ Defueling. Flight Engineers may refuel/ defuel when maintenance personnel are not available. Use the refueling/ defueling checklist during all refueling and defueling operations. If ground support personnel are not available, the aircraft commander will designate other crewmembers to assist the FE. When not directly involved in the refueling operation, personnel will remain at least 50 feet from the aircraft.

A21.14. Preflight. FEs are authorized to perform preflight IAW applicable TOs.

A21.15. Aircraft Systems Management. The FE will monitor aircraft systems during flight and ground operations. Notify the pilot of all abnormal indications and take action as directed. When noting a malfunction during takeoff that may be cause for an abort, state the problem (e. g., rotor RPM low).

A21.16. Flight Monitoring. The FE will assist with flight monitoring.

A21.16.1. Notify the pilot when observing abnormal deviations from airspeed, altitude, and heading. Also, advise pilot when approaching any aircraft flight manual limitation and comply with other duties as briefed by the pilot.

A21.16.2. Notify the pilot if aircraft configuration (e. g., rotor RPM, gear, cargo door, ramp) is not correct for the maneuver being performed.

A21.16.3. Maintain outside vigilance during flight.

A21.16.4. Monitor the primary radio, interplane radio, interphone, and HOT MIC.

A21.16.5. Assist in navigation as necessary.

A21.16.6. Monitor fuel status.

A21.17. Takeoff and Landing Data (TOLD):

A21.17.1. Complete TOLD prior to takeoff. Whenever possible, TOLD should be completed prior to the aircrew briefing. Compute data applicable to the type takeoff/ landing to be made (in and out of ground effect, power available/ required at intended hover height, single engine capability, etc.).

A21.17.2. During multiple takeoffs/ landings, only affected parameters need be recomputed if favorable conditions afford an additional margin of safety in all other areas (e. g., gross weight decreases due to fuel burn- off, while pressure altitude and temperature remain constant).

A21.17.3. Prebrief TOLD data for remote LZs prior to high reconnaissance and confirm prior to the low reconnaissance. Re-compute TOLD data if the difference between predicted and actual landing conditions is greater than 500 feet pressure altitude and/ or 5 degrees centigrade.

A21.18. Fuel Management.

A21.18.1. Preflight. The FE will ensure the preplanned fuel load is on board the aircraft.

A21.18.2. Inflight. The FE will monitor fuel management. He/ she will compute fuel consumption, bingo fuel, and keep the pilot advised of fuel status at all times.

A21.19. Weight and Balance. A new or corrected DD Form 365-4, Form F - **Weight and Balance Clearance- Transport/Tactical**, need not be re-computed provided the initial takeoff gross weight is not changed by more than 500 pounds. Although no written adjustment may be required, the FE will compute these changes to ensure center of gravity limits are not exceeded. The aircraft commander will be informed of these changes.

A21.20. Use of DD Form 365-4.

A21.20.1. Unit DOV will determine whether "zero fuel" weights/ computations are required on the DD Form 365-4. If "zero fuel" is not utilized, the following applies to the DD Form 365-4:

A21.20.1.1. Line through item 21.

A21.20.1.2. Enter "less fuel" under item 22. (Item 10 minus item 23.)

A21.20.1.3. Enter the aircraft's minimum fuel in item 23 and line through the adjoining index/mom squares.

A21.20.1.4. All other zero fuel references on the DD Form 365-4 may be left blank.

A21.20.2. Passengers. Item 13 will indicate the number of passengers in a compartment/seat/position, their weight and the compartment/arm/station.

A21.20.3. Cargo. Use the last cargo and compartment/arm/station column on the right side of the form.

Section A21F—Training Procedures

A21.21. Simulated Emergency Procedures:

A21.21.1. Practice emergency procedures will be briefed during the flight briefing.

A21.21.2. Emergency procedures will be practiced with a pilot designated as an IP on the flight authorizations occupying a duty position with a set of controls.

A21.21.3. Emergency procedures will be conducted at an approved landing area under positive radio communications with the appropriate controlling agency (for example, tower, runway supervisory unit, UNICOM, etc.). Aircraft rescue and fire-fighting equipment will be immediately available. Slide landings will only be accomplished to runways or suitable taxiways, with ATC approval. Exercise extreme caution on barrier-equipped runways. Slide landings may also be accomplished to other approved surfaces meeting helicopter runway criteria specified in AFI 32- 1123, *Airfield and Heliport Planning*.

A21.21.4. Applicable emergency procedures include:

A21.21.4.1. Autorotations, hydraulic boost off (system one only), manual fuel, and simulated single engine landings.

★A21.21.5. Simulated single engine practice will not be initiated below 150 feet AGL and 55 KIAS.

★A21.21.6. Simulated hydraulics malfunctions may be initiated on the ground, or above 500 feet AGL and 70 KIAS.

A21.21.7. Simulated manual fuel operations may be initiated on the ground, in a hover if single-engine hover power is available, or above 500 feet AGL and 70 KIAS.

A21.21.8. Practice Autorotations. The following policy is established for practice autorotations:

A21.21.8.1. Due to the risk associated with this maneuver, carefully consider wind, density altitude, aircraft gross weight, and individual pilot proficiency prior to training/currency.

A21.21.8.2. The initial autorotation for training/ currency will be a straight-ahead autorotation accomplished by the instructor to evaluate aircraft performance (not required for evaluation flights).

A21.21.8.3. IPs will terminate the maneuver and initiate a power recovery at the first indication of abnormally high/ low rotor RPM, excessive sink rate, low airspeed, ineffective flare or at any time an inadvertent touchdown might occur.

A21.21.8.4. Autorotations will be accomplished to a runway, taxiway or approved slide area, if possible. When such an area is not available, a smooth level area is to be selected, and the instructor/flight examiner will ensure it is free of obstructions prior to commencing training.