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SECRETARY OF THE AIR FORCE**

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Flying Operations

***MQ-1 AND MQ-9—OPERATIONS
PROCEDURES***

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This instruction implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*; AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*; and references AFI 11-202V3, *General Flight Rules*. This volume prescribes standard operations procedures for United States Air Force (USAF) MQ-1 and MQ-9 aircraft and applies to all MQ-1 and MQ-9 units. This volume applies to Air National Guard (ANG) and Air Force Reserve Command (AFRC). Major commands (MAJCOM), Direct Reporting Units (DRU), and Field Operating Units (FOA) will forward proposed supplements to this volume to ACC/A3C for review and coordination prior to approval and publishing in accordance with (IAW) AFI 11-200. Copies of MAJCOM/DRU/FOA-level supplements, after approved and published, will be provided by the issuing MAJCOM/DRU/FOA to AFFSA/A3OF, ACC/A3CU, and the user MAJCOM and ANG offices of primary responsibility. Field units below MAJCOM/DRU/FOA level will forward copies of their supplements to this publication to their parent MAJCOM/DRU/FOA office of primary responsibility for post-publication review. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) maintained in the Air Force Records Information Management System (AFRIMS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>.

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Note: For the purposes of this instruction, the ANG is considered a MAJCOM. MAJCOM specific guidance is embedded within the text and prefaced with the MAJCOM acronym. Where such guidance applies to both ANG and AFRC the term Air Reserve Component (ARC) is used.

SUMMARY OF CHANGES

This interim change revises AFI 11-2MQ-1&9 Volume 3 by (1) clarifying GCS entry procedures, (2) adding guidance for use of recording devices, (3) clarifying weapons employment, (4) establishing guidance for setting up a GCS for another crew, and (5) adding additional guidance for taxi operations. A margin bar (|) indicates newly revised material.

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Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. **Scope.** This volume establishes procedures for operation of the MQ-1 and MQ-9 unmanned aircraft systems. It provides guidelines for MQ-1 and MQ-9 operations and applies to all aircrews and all management levels concerned with operation of the MQ-1 and MQ-9. Use this instruction in conjunction with aircraft flight manuals, Department of Defense Flight Information Publication (FLIP), and applicable Joint and USAF directives. Pilots will comply with Joint Order 7610.4, Special Military Operations, Chapter 12, Section 9, UAS Operations in the NAS, where applicable.

1.1.2. **Phase Manuals.** Training units may develop phase manuals from procedures contained in relevant documents. Phase manuals may expand on basic procedures, but they will not be less restrictive than flight manuals and applicable USAF instructions. Operational units may use phase manuals to augment mission qualification and continuation training.

1.2. Aircrew Responsibilities. In conjunction with other governing directives, this volume prescribes procedures for MQ-1 and MQ-9 aircraft operations under most circumstances, but it is not a substitute for sound judgment. Crewmembers may accomplish operations or procedures not specifically addressed in this volume if they enhance safe and effective mission accomplishment.

1.2.1. **Pilot in Command (PIC).** For a crew with more than one qualified pilot, the PIC will be identified prior to assumption of aircraft control and has responsibility and authority as defined in AFI 11-202V3. The PIC may change during missions as pilots cycle in and out of the ground control station (GCS).

1.2.2. The Pilot/Sensor Operator (PSO) racks allow for the pilot to fly from either the left or right seat. For all ground and flight operations, the pilot flying the aircraft will occupy the left seat unless equipment malfunctions dictate use of the right seat (**EXCEPTION:** For a multi-aircraft control ground control station (GCS), the right seat is defined as the corresponding sensor operator (SO) station in the back of the GCS). During critical phases of flight (see **Attachment 1**, Terms and Definitions), a SO must be in the right seat (**EXCEPTION:** Unit commanders may designate, by name in writing, pilots who are authorized to occupy the right seat during critical phases of flight). During non-critical phases of flight above 2,000 feet above ground level (AGL), the right seat may be unoccupied.

1.2.3. **Sensor Operator (SO).** The SO performs target acquisition and maintains custody of the target to include recommending optimal sensor selection and, if required, search patterns for the specific target. He/she identifies key target features and location to facilitate target reacquisition. The SO is also responsible for knowing desired aircraft positions to maximize effectiveness of various sensors and for coordinating with other crewmembers to maximize mission effectiveness. During weapons employment the SO will maintain custody of and laser designate/illuminate the DPI designated by the PIC in accordance with briefed TTPs and voice concerns/questions with the attack or weaponeering. Unless directed otherwise by the PIC, during all phases of flight, the SO will notify the PIC prior to changing sensors or moving the MTS from a locked position. The SO also assists in monitoring aircraft systems and operating airspace.

1.2.4. Crewmembers must have a thorough working knowledge of all procedures included in this volume that are applicable to their crew positions.

1.3. Deviations and Waivers.

1.3.1. Deviations. Deviations from these procedures require specific approval of MAJCOM/A3 unless an aircraft emergency or urgent operational necessity dictates otherwise. In these cases, the PIC will evaluate all options and take the appropriate action to ensure the safe recovery of the aircraft. Deviations must be reported to MAJCOM/A3 as soon as practical.

1.3.2. Waivers. Waiver authority for this instruction is the MAJCOM/A3 (ANG: NGB/A3) or COMAFFOR only for forces under their operational control, unless otherwise noted.

1.4. Key Terms and Definitions.

1.4.1. **“Will”**, **“shall”** or **“must”** indicates a mandatory requirement.

1.4.2. **“Should”** is normally used to indicate a preferred, but not mandatory, method of accomplishment.

1.4.3. **“May”** indicates an acceptable or suggested means of accomplishment.

1.5. Distribution. Each aircrew member is authorized a copy of this volume.

Chapter 2

MISSION PLANNING & BRIEFING

2.1. Responsibilities. The responsibility for mission planning/preparation is shared jointly by the individual aircrew members and the operations and intelligence functions of the organization.

2.1.1. The PIC is responsible for mission planning and will ensure the crew is briefed prior to assuming command of the aircraft. Pilots will ensure the best route, sensors, and altitudes are used for target acquisition and threat avoidance.

2.1.2. Aircrew other than the aircrew flying the mission may accomplish the mission planning. Aircrews will not fly unbriefed missions and/or events. If operationally necessary, missions may be modified while the aircraft is airborne as long as changes do not compromise flight safety. The PIC will ensure all aircrew are aware of and acknowledge any changes.

2.1.3. Complete sufficient flight planning to ensure safe mission accomplishment. Areas covered will include, at a minimum, weather, emergency mission setup, fuel requirements, mission objectives, stores configuration (if applicable), communication procedures, and Operational Risk Management (ORM) (include takeoff and landing data, departure and arrival procedures, and threat study when applicable).

2.2. Maps, Charts, and Flight Logs.

2.2.1. **Local Area Maps.** A local area map of sufficient detail to remain within assigned training/operational areas and identify potential emergency landing sites will be available for display in the GCS. Ensure that, as a minimum, the PSO racks contain charts/maps that are accurate enough to ensure the safe operation of the aircraft.

2.2.2. **Enroute Charts/Approach Procedures.** Units will ensure FLIP publications applicable to MQ-1 or MQ-9 flight operations are available. These can include enroute charts, terminal instrument procedure books, or loading the current electronic FLIP for display on monitors in the GCS. The PIC will also review applicable FLIP for the terminal areas and along the route of flight during pre-mission planning.

2.2.3. **Mission Maps and Navigation Route Maps.** Display the most appropriate chart/map during the mission. Charts will be of sufficient scale to provide adequate navigation and obstacle/terrain avoidance. The PIC shall consider minimum safe altitude (MSA) when determining normal, operational, and emergency mission altitudes.

2.3. Briefing and Debriefing.

2.3.1. **Briefing Guides.** Briefing guides can be found in **Attachments 2-5**. All applicable items in the briefing guides will be adequately briefed by the PIC or other members of the crew. Units may customize these guides as required for mission accomplishment. Items published in unit standards and understood by all participants may be briefed as “standard”.

2.3.2. **Briefing Times.** Ensure enough time is allotted so that mission briefings, crew briefings, and changeover briefings cover all required items and provide enough time to transition between events.

2.3.3. **Mission Brief.** The pilot will brief all crewmembers to ensure safe and effective mission accomplishment. Briefings will be tailored to accommodate the experience level and capabilities of each crewmember participating in the mission.

2.3.3.1. All crewmembers scheduled to fly the mission will attend a mission briefing. Units may cover items from the Mission/Crew Briefing Guide in a mass setting conducted by the Operations Supervisor (AFSOC: Mission Director (MD), or Flying Operations Supervisor (FOS) as applicable). Crewmembers that did not attend a mission briefing will obtain Operations Supervisor / MD / FOS (as applicable) approval prior to participating in a flight. The PIC will ensure crewmembers participating in a flight under Operations Supervisor, MD, or FOS approval are adequately briefed prior to assuming crew duties.

2.3.3.2. The PIC should brief an alternate mission for each flight if applicable.

2.3.4. **Changeover Briefs.** Individual crewmembers will complete a changeover brief ([Attachment 3](#)) for each crew position changeover. Briefs will not be accomplished simultaneously. Crew specific changeover briefs may be done in accordance with squadron standards.

2.3.4.1. The incoming aircrew is responsible for ensuring they are briefed on the mission and aircraft status.

2.3.4.2. The outgoing aircrew is responsible for ensuring the incoming aircrew is aware of any write-ups and/or unusual situations encountered during the mission.

2.3.4.3. Change out one crewmember at a time to ensure continuous monitoring of the aircraft. The incoming PIC is the final authority in determining if circumstances are safe to replace crews.

2.3.5. **Fuel, Emitters, Navigation, Communication, and Engage (FENCE) Check.** Crewmembers will complete FENCE checks on all operational missions IAW Air Force Tactics, Techniques, and Procedures (AFTTP) 3-3.MQ-1 *Combat Aircraft Fundamentals MQ-1* or AFTTP 3-3.MQ-9 *Combat Aircraft Fundamentals MQ-9* (as applicable), and local procedures. Training missions may include FENCE checks as required to meet training objectives. Units may augment the AFTTP FENCE Check as needed to meet unit requirements.

2.3.6. **Combat Search and Rescue (CSAR)/On-scene Commander (OSC) Checklist.** CSAR checklist and procedures are contained in AFTTP 3-1.MQ-1/9 when required to assist in CSAR efforts or act as the OSC for a CSAR event. Units may augment this checklist.

2.3.7. **Mission Debrief.** Following crew changeover or landing, all participating crewmembers will debrief mission elements using the Mission/Crew Debriefing Guide in [Attachment 4](#) or local debriefing aids.

Chapter 3

NORMAL OPERATING PROCEDURES

3.1. Ground Control Station.

3.1.1. The number of people allowed in the GCS should be the minimum required to meet mission requirements and to maintain a sterile cockpit environment. The PIC is the final authority on the number of people allowed in the GCS (to include visitors) during operations. Only qualified pilots or IP-supervised student pilots may fly the aircraft.

3.1.2. Aircrew entering a GCS should attempt to notify the occupying crew prior to entry and will minimize impact on crews in critical phases of flight.

3.1.2.1. During abnormal operations, PICs should restrict entry into the GCS only to individuals with appropriate system expertise.

3.1.2.2. Units will train aircrew on GCS entry procedures during local area orientation.

3.1.3. Aircrew will not place items (checklists, charts, etc.) behind the flap lever, propeller control lever (MQ-1) or condition lever (MQ-9), throttle, or speed lever at any time. Aircrew will ensure no items interfere with aircraft controls or the Heads-Down Displays (HDD). Items may be placed on the shelf above the HDD.

3.1.4. Unit commanders will ensure all aircrew members participating in missions are focused on their in-flight responsibilities and not tasked with other duties while the mission is underway.

3.1.5. Smoking is prohibited within 50 feet of the GCS.

3.1.6. While in the GCS aircrew members will only operate electronic devices necessary for safety of flight or the accomplishment of the mission.

3.1.7. The PIC will ensure the GCS is properly secured after each mission to include the removal/securing of all classified materials.

3.1.8. Aircrew will use all available GCS recording devices to the maximum extent possible.

3.2. Required Equipment. The GCS must have required equipment for flight per AFI 11-202 V3. Additionally, the equipment listed in this paragraph is required for initial takeoff. If the equipment fails while airborne, the PIC will determine whether to continue the mission.

3.2.1. Two separate cameras are required for flight. This requirement will include at least one nose camera.

3.2.2. INS/GPS.

3.2.2.1. MQ-1. Both the inertial navigation system (INS) and global positioning systems (GPS) must be operational.

3.2.2.2. MQ-9. All INS/GPS navigational systems must be operational at takeoff. Should an INS/GPS unit fail once airborne, the mission may continue, provided that a minimum of two INS/GPS units are fully-functional and that the PIC determines that the loss of one INS/GPS unit will not adversely affect mission accomplishment.

3.2.3. Missions that will include a portion of the flight during periods of night as defined by AFI 11-202V3 require at least one approved infrared (IR) video camera.

3.2.4. An operable radio or alternate means of communication (mIRC chat, land line, sat phone, etc) suitable for mission accomplishment and real-time Air Traffic Control (ATC)/Control and Reporting Center (CRC) coordination.

3.2.5. A functional telephone will be available as a back-up means of communication when flying in controlled airspace.

3.2.6. Units may include additional equipment requirements for training and operational missions in their local procedures supplement (**Chapter 8**) to this instruction.

3.3. Communications. Aircrew will exercise intercom discipline. Units should tailor intercom use to mission specifications and unit needs.

3.3.1. **Ground Communication.** The pilot will ensure two-way communication is established with the ground crew prior to all ground checks and anytime the aircraft's engine is operating on the ground. Two-way communication will be maintained until the pilot releases the ground crew.

3.3.2. In-flight Communications.

3.3.2.1. Limit communications to flight-critical information during critical phases of flight.

3.3.2.1.1. The pilot should announce intentions during critical phases of flight and when circumstances require deviating from normal procedures.

3.3.2.1.2. The sensor operator will notify the pilot immediately upon seeing a potential air traffic conflict, airspace deviation or potential terrain or obstruction clearance conflict. In addition the SO should notify the pilot upon seeing a 200 foot or greater deviation in planned altitude.

3.3.2.2. Each aircrew member will monitor the crew intercom and aircraft radio to the maximum extent possible, and will announce to the crew when not monitoring appropriate channels, and when resuming monitoring. In cases where the capability exists to connect with the intercom system of a different GCS aircrew will announce their presence on intercom in accordance with unit guidance.

3.3.2.3. Before making any camera changes or MTS manipulation below 2,000 feet AGL, each crewmember will announce, and the other crewmember acknowledge, the change.

3.3.2.4. Primary aircrew members will announce the execution of critical action procedures (CAP) while accomplishing the action, or notify other crewmembers immediately after the fact which CAPs have been accomplished.

3.3.2.5. Aircrews will minimize telephone use during critical phases of flight.

3.3.2.6. The pilot will announce, and the sensor operator will acknowledge, all altitudes departing from and climbing/descending to on the intercom.

3.3.2.7. The sensor operator will inform the pilot of all HDD caution and warning messages during non-critical phases of flight. Pilots will brief which HDD messages will be called out during critical phases of flight.

3.4. Checklists.

3.4.1. Each crewmember will reference applicable checklists during all phases of flight. The PIC is responsible for checklist completion. Electronic checklists are authorized for use however spare electronic or paper copy checklists must be available to each crewmember should failure of the primary checklist source occur.

3.4.2. Aircrews should make every effort to avoid non-essential tasks when below 2,000 feet AGL.

3.4.3. Unit-developed checklists, such as fanfolds, are authorized. Prior to use, these checklists must be approved by the MAJCOM Standardization/Evaluation and the aircraft Flight Manual Manager (FMM), and meet requirements established in AFI 11-215, *USAF Flight Manuals Program (FMP)*.

3.4.4. Approved checklists contained within AFTTP 3-1.Predator, AFTTP 3-1.MQ-9, AFTTP 3-3.Predator, and AFTTP 3-3.MQ-9 are authorized for use during weapons deliveries.

3.4.5. Setting up a GCS for another crew (also referred to as “running presets”) shall be avoided to the maximum extent possible. Local OG/CCs may authorize a qualified crew other than the gaining handover crew to execute gaining handover checklist procedures where local procedures are adopted and published which provide guidance to accomplish this practice safely. The gaining handover PIC is responsible for the completion of all checklists necessary to gain control of the aircraft regardless of checklist items briefed as complete.

3.4.5.1. Aircrews that will not gain control of the aircraft, but complete checklists for later crews should avoid leaving individual steps unaccomplished. If a checklist step cannot yet be completed because information is not known, stop at the last completed step and proceed no further.

3.4.5.2. Checklists should be completed as a crew.

3.4.5.3. Aircrews will advise the operations supervisor a GCS is being set up for a later crew.

3.4.5.4. Aircrews that will conduct the gaining handover should make every effort to complete all required checklists themselves.

3.4.5.5. Prior to assuming control of the aircraft, the gaining handover PIC must be aware of the status of both the GCS and the aircraft.

3.5. Ground Operations. During ground operations with the aircraft powered, the pilot will warn the crew chief prior to any action that might cause the aircraft control surfaces to move and receive verbal acknowledgement that all personnel are clear.

3.6. Engine Start/Taxi.

3.6.1. Engine Start.

3.6.1.1. All engine starts require a fireguard.

3.6.1.2. The engine will only be started on the command of the pilot.

3.6.2. Taxi Operations.

3.6.2.1. The pilot and sensor operator will use the best available camera, or combination of cameras, to ensure safe taxi operations given the current conditions.

3.6.2.2. All aircrew will abide by taxi distances and restrictions IAW AFI 11-218, "*Aircraft Operations and Movement on the Ground*", and will not taxi an aircraft within 25 feet of obstructions without wing walkers unless exempted or waived.

3.6.2.2.1. With wing walkers, avoid taxi obstructions by at least 10 feet. When taxi clearance is doubtful, use a wing walker.

3.6.2.2.2. When taxiing in an area requiring a marshaller IAW AFI 11-218, aircrew will maintain visual contact with the marshaller until established on taxiway centerline and clear of obstructions. If visual contact with the marshaller is lost prior to being established on taxiway centerline and clear of obstructions, the pilot will stop the aircraft until visual contact with the marshaller is regained. Once the all clear signal is given by the marshaller, aircrew will taxi at their own discretion.

3.6.2.3. If the pilot loses sight of the taxiway centerline, the pilot will stop the aircraft until visual contact with the centerline is reacquired. If the pilot cannot regain sight of the centerline, a marshaller will be used before moving the aircraft any further.

3.6.2.4. The sensor operator will use the MTS to ensure the aircraft is clear of obstructions during taxi operations. The sensor operator will obtain clearance from the pilot prior to releasing the MTS from position mode.

3.6.2.5. If the pilot is only using the MTS to taxi, the aircraft will be brought to a complete stop before releasing the MTS from position mode. The MTS will be placed in position mode prior to resuming taxi.

3.6.2.6. Maintain safe taxi speeds at all times, not to exceed 10 knots ground speed (KGS) on a taxiway, 20 KGS on a runway, and 5 KGS in a turn.

3.6.2.7. Minimum taxi interval between MQ-1 and/or MQ-9 aircraft is 150 feet daytime, 300 feet at night. Pilots will exercise caution and increase following distance when taxiing behind heavy or jet powered aircraft.

3.6.2.8. When RCR is less than 12, minimum taxi interval is 300 feet.

3.6.2.9. Prior to unpinning/arming, pilots will confirm with the ground crew that hands and feet are clear of all aircraft controls and parking brake is set.

3.6.2.10. Pilots will not taxi in front of aircraft being armed/de-armed with forward firing ordnance.

3.6.2.11. Pilots will not taxi over a raised cable.

3.7. Runway Requirements. Waiver authority for this paragraph is the OG/CC.

3.7.1. Minimum runway length is 5,000 feet.

3.7.2. Minimum runway width is 75 feet.

3.7.3. Minimum taxiway width is 50 feet.

3.8. Takeoff/Departure.

- 3.8.1. The pilot flying will accomplish a departure brief to include, as a minimum, departure runway, weather, rotation speed, liftoff speed, climb speeds, and emergency procedures.
- 3.8.2. For takeoff, the sensor operator will select a different HUD video source and camera from the one selected by the pilot.
- 3.8.3. On training missions, do not takeoff if the computed takeoff roll exceeds 80% of the available runway.
- 3.8.4. Crews may takeoff prior to a raised cable provided there is at least 5,000 ft of runway or minimum required takeoff distance (whichever is greater) prior to the raised cable.
- 3.8.5. The sensor operator will place the MTS in position mode for takeoff. Flight graphics will be displayed on both PSO racks until at least 500 ft AGL.
- 3.8.6. During departure/arrival, the SO will monitor the flight path and advise the pilot of any deviations from ATC clearance.
- 3.8.7. **Closed Traffic Pattern.** Initiate a closed pattern at the departure end of the runway (or sooner if permitted by Local Operating Procedures) when cleared by tower. Minimum airspeed to initiate a closed pattern is computed climb speed.

3.9. Cruise.

- 3.9.1. The pilot will always have flight graphics displayed.
- 3.9.2. **Operations (Ops) Checks.**
 - 3.9.2.1. The aircrew will perform operations checks at least once per hour. These checks will include fuel level, oil level, propeller pitch operation (MQ-1), electrical, datalink, engine parameters and emergency mission status at a minimum.
 - 3.9.2.2. Ops checks are also required:
 - 3.9.2.2.1. During climb or at level-off after takeoff.
 - 3.9.2.2.2. Prior to entering an air-to-surface range, once while on the range if multiple passes are made, and after departing the range.
 - 3.9.2.2.3. Prior to transitioning to any critical phase of flight.
 - 3.9.2.3. The conduct of ops and oil level checks will not interfere with tactical or safety-of-flight operations. If required, aircrew may postpone these checks until such time as they may be accomplished without mission degradation.

3.10. Approach and Landing.

- 3.10.1. Aircrew will comply with wake turbulence avoidance criteria for small aircraft.
- 3.10.2. **Approach.**
 - 3.10.2.1. The pilot will accomplish an approach brief including, as a minimum, approach speed, glide speed, winds, altimeter, type of landing, go around point and missed approach procedures (as required). Additional items may be briefed per local instructions.

3.10.2.2. The pilot must have visual reference to the ground prior to descending below 1,500 feet AGL in the terminal area without a published Airport Surveillance Radar or Precision Approach Radar terminal approach procedure at the operating airfield.

3.10.2.3. Pilots will establish normal glide path by 200 feet AGL. Descent rates greater than 1,200 feet per minute (FPM) below 200 feet AGL, greater than 600 FPM (MQ-1) or 800 FPM (MQ-9) below 50 feet AGL, airspeed more than 5 KIAS below calculated approach speed, or a pilot-induced oscillation (PIO)/bounce require a go-around. The sensor operator will monitor the approach and announce over intercom any deviations exceeding these parameters and will call a go around.

3.10.2.4. Unless otherwise briefed, the SO will announce altitude deviations exceeding +/-100' at the Initial Approach Fix, Final Approach Fix (FAF), and Minimum Descent Altitude, as well as when reaching Decision Height (DH) or the Missed Approach Point (MAP).

3.10.3. Landing.

3.10.3.1. The pilot will normally accomplish a 3 degree approach.

3.10.3.2. The recommended touchdown zone for a visual approach is 500-1,500 feet from the threshold, or the glide path interception point for a precision approach. Do not establish Runway Point of Intercept (RPI) near the threshold unless landing distance is critical. When local procedures or unique runway surface conditions require landing beyond the recommended point on the runway, adjust the touchdown zone accordingly, and brief applicable crewmembers.

3.10.3.3. Crewmembers will not attempt landing or touch-and-goes over raised webbing-type barriers (e.g. MA-1A, 61QS11). Pilots may land or accomplish touch-and-goes beyond raised cables provided there is 5,000 feet remaining to the runway end or the next raised cable.

3.10.3.4. For landing, the SO will select a different HUD video source and camera from the one selected by the pilot.

3.10.3.5. The MTS will be placed in position mode and flight graphics displayed on both PSO racks prior to descending below 500 feet AGL.

3.10.3.6. The Before Landing checklist should be accomplished prior to departing the perch, departing the Final Approach Fix, 3nm final on a straight-in/visual approach, or departing Low Key.

3.10.3.7. If the MTS is the only available video source for landing, the SO will not conduct a non-uniformity correction (NUC) of the MTS on final approach without prior coordination with the PIC. If the MTS is not suitable for landing below 1,500 feet AGL on final approach, and no other video sources are available, the crew must initiate a go around.

3.10.3.8. Pilots will not practice night electro-optical (EO) nose-camera landings. Pilots may practice night EO nose camera low approaches.

3.10.3.9. When the computed landing roll exceeds 80% of the available runway, land at an alternate, if possible.

3.11. Fuel Requirements.

3.11.1. **Normal Recovery Fuel.** The fuel on initial or at the FAF at the base of intended landing or alternate. Establish fuel quantity locally or: 60 pounds (MQ-1) or 400 pounds (MQ-9), whichever is higher.

3.11.2. **Minimum Fuel.** Pilots will declare minimum fuel to the controlling agency as soon as it becomes apparent that an aircraft will enter initial or start an instrument final approach at the base of intended landing, or alternate if required, with 50 pounds (MQ-1) or 350 pounds (MQ-9) of fuel or less.

3.11.3. **Emergency Fuel.** Pilots will declare emergency fuel to the controlling agency as soon as it becomes apparent that an aircraft will enter initial or start an instrument final approach at the base of intended landing, or alternate if required, with 40 pounds (MQ-1) or 300 pounds (MQ-9) of fuel or less.

3.12. In-Flight Practice of Emergency Procedures.

3.12.1. Practice of aborted takeoffs and unusual attitude procedures in flight are prohibited.

3.12.2. Practice of in-flight engine shutdown is prohibited.

3.12.3. Simulated Flame-Out (SFO) Pattern Procedures.

3.12.3.1. Minimum approach airspeed during an SFO traffic pattern is stall speed plus 10 KIAS (MQ-1) or 15 KIAS (MQ-9).

3.12.3.2. Terminate the maneuver if not in a position to land by base key or one mile final (straight-in approach). Crews shall make an intracockpit base key/one mile final (straight-in approach) call on SFOs stating any deviations from planned parameters and establishment of intentions to continue or go around.

3.12.3.3. Touchdown from an SFO is prohibited. Initiate go-arounds from SFO patterns in sufficient time to prevent touchdown.

3.12.4. Because Instructors/Flight Examiners do not have immediate access to a set of controls, the pilot at the controls will ensure all in-flight practice of emergency procedures are thoroughly briefed, prior to initiation. Instructors/Flight Examiners will direct the crew on expected actions (verbalized/simulated or actual procedures) during in-flight practice or simulation of emergency procedures.

3.13. Unexpended Ordnance.

3.13.1. **(MQ-9 only)** Aircraft returning to base with unexpended free-fall live ordnance will fly a straight-in approach to a full stop, unless operational requirements dictate otherwise. Pattern work, to include touch and go's are authorized with unexpended inert free-fall and "pinned" training munitions.

3.13.2. Aircraft returning with unexpended forward firing live ordnance may accomplish pattern work.

3.14. De-Arm Procedures. All aircraft with live or inert ordnance on board will go through de-arm prior to taxi back. Pilots will confirm all switches are safe and hands are clear and parking brake set prior to de-arm crew approaching the aircraft.

3.15. Functional Check Flight (FCF). There is no FCF requirement for either the MQ-1 or MQ-9.

3.16. AF FORM 781, Aircrew/Mission Flight Data Document. Prior to assuming control of the aircraft in the GCS, the GCS PIC must be aware of the status of the entire system, both aircraft and GCS. AFTO Forms 781 will not leave control of the PIC while the aircraft is in flight.

3.16.1. **LRE PIC.** IAW AFI 21-101, *Aircraft and Equipment Maintenance Management*, the LRE PIC will review applicable aircraft and Launch/Recovery GCS (LRGCS) AFTO Form 781 series forms prior to launch and relay pertinent configuration data to the MCE PIC. The LRE PIC will enter any aircraft discrepancies into the aircraft AFTO Forms 781 that are relayed by the MCE PIC.

3.16.2. **MCE PIC.** IAW AFI 21-101, the MCE PIC will review applicable aircraft AFTO Form 781As, and GCS AFTO Form 781 series forms prior to handover from the LRE. MCE PIC will annotate all aircraft discrepancies in Skynet / electronic maintenance log or pass to the LRE PIC for entry into the aircraft forms if Skynet is not used / available. MCE PIC will document GCS discrepancies on GCS AFTO Form 781A.

3.16.3. **MCE to MCE Changeover.** MCE PICs will review applicable aircraft AFTO Form 781As and GCS AFTO Form 781 series forms prior to changeover. During the changeover briefing, the outgoing MCE PIC will ensure the incoming MCE crew is briefed on any updates to aircraft and GCS status to include discrepancies that have been annotated in Skynet or passed to the LRE PIC for entry into the aircraft forms if Skynet is not used / available.

3.17. Above Maximum Allowable Gross Weight (MAGW) Operations. Above MAGW operations require a waiver IAW [paragraph 1.3.2](#)

3.17.1. The following considerations will be evaluated when conducting above-MAGW operations:

3.17.1.1. Pilot training, proficiency, and currency.

3.17.1.2. Environmental conditions.

3.17.1.3. Hard Landing Inspection Criteria chart from the flight manual. (*MQ-9 only*) Maximum Descent Rate at Touchdown figure in the flight manual. In the absence of flight manual data, landings above 10,500 pounds GWT shall not be accomplished.

3.17.2. **(MQ-1 only) Takeoff and Landing Data (TOLD).** The Aeronautical Systems Center (ASC/WII) has generated above MAGW performance data for the flight manual based on engineering estimates only. Refer to TO 1Q-1(M)B-1-1 for further information on performance data.

3.17.3. **Training.** Any waiver for above MAGW operations should include guidelines to conduct takeoffs and low approaches to meet training requirements. Landings above flight manual maximum allowable landing weight, to include touch and go landings, will not be practiced.

3.17.4. **Heavyweight Landing Assessment.** The primary risk associated with above MAGW operations is the increased probability of airframe damage during landing. If

circumstances require a landing above maximum flight manual landing weight limitations (such as weather, aircraft malfunction, etc.), the crew will immediately notify squadron supervision and SOF/FOS. If time permits for safe pilot change out, the most experienced pilot in the GCS will conduct the landing.

3.17.5. Heavyweight Landing Inspection Criteria. Crews will document every landing above maximum allowable landing weight in the AFTO Form 781 (include landing weight and sink rate). Aircraft with applicable software, and configured with a laser altimeter, are exempt from this paragraph's requirements.

3.18. Interfly. Interfly is the exchange and/or substitution of aircrew members and/or aircraft between MAJCOMs to accomplish flying missions. Normally, interfly should be limited to specific operations/tests, exercises, or special circumstances.

3.18.1. The OG/CC (for AFSOC, OG/CC or COMAFSOF) is the approval authority for interfly on aircraft under his or her control. In all cases, interfly aircrew will be qualified in the MDS.

3.19. Reduced Lighting Training. Conduct reduced lighting training only in approved airspace.

3.20. Low Altitude (LOWAT) Operations. The low-altitude environment defined by this regulation is at or below 5,000 feet AGL/ASL. Aircrew are authorized to fly in low-altitude environment Day/Night, no lower than 1,000 feet AGL, IAW AFI 11-214, *Air Operations Rules and Procedures*, restrictions and the following procedures.

3.20.1. Terrain Clearance Requirements. During all low-altitude flight, the crew will ensure the aircraft remains a minimum of 1 NM away from any factor terrain. Factor terrain is defined as any terrain within 1,000 feet (at or below) the current aircraft operating altitude. When determining the 1 NM standoff requirement, assume the worst case condition of a lost link maneuvering aircraft and account for drift caused by winds.

3.20.2. Mission Preparation.

3.20.2.1. Briefing requirements. During briefings, emphasis will be on low-altitude flight maneuvering, effects of task saturation, time to ground impact, emergency landing sites, terrain features/obstacles along the route of flight, T.O. emergency mission flight profile and associated planning considerations, and emergency mission start point placement requirements for terrain clearance.

3.20.2.1.1. Low-Level Abort Procedures. Compute and brief low-level abort altitude(s). Compute the abort altitude for the entire route/area using minimum safe altitude. Minimum Safe Altitude (MSA) will provide a clearance of 1,000 feet above the highest obstacle/terrain feature (rounded to the next highest 100 feet) within 5 NM of the planned course, route boundaries, or operating area (e.g. military operating area (MOA), low fly area, restricted area, etc.). Operation below MSA is authorized day or night as long as the terrain clearance requirements of paragraph 3.20.1 are complied with.

3.20.2.1.1.1. Aircrews shall compute an MSA for each leg/segment of the intended route of flight and for separate operating areas.

3.20.2.1.2. During mission planning, determine areas within the planned operating area(s) that provide a minimum of 1 NM clearance from any terrain from 1000 feet below the planned minimum operating altitude. These areas will be annotated on the low-altitude chart. Increase the 1 NM clearance requirement, based on the turn radius of the aircraft going lost-link. Determine limitations, if any, on emergency mission start point placement to ensure the 1 NM terrain clearance is met if the aircraft goes lost link.

3.20.2.1.2.1. LOWAT Navigation. When navigating point-to-point in the low-altitude environment, the basic 1 NM terrain clearance requirement remains unchanged. However, if operating on a point to point pre-planned route, with a current and updated emergency mission, a lost link scenario will not result in the aircraft deviating from the pre-planned routing. In this case, there is no requirement to account for additional terrain standoff due to lost link aircraft maneuvering.

3.20.2.1.2.2. LOWAT Tactical Maneuvering. When tactical maneuvering will be required, the 1 NM terrain standoff must account for the possibility of a lost link aircraft and the associated maneuvers as well as the effects of winds.

3.20.2.2. Low-Altitude Maps. On all low-altitude flights, each aircraft will contain a minimum of one Chart-Updating Manual (CHUM) updated map of the low-altitude route or training areas. The map will be available either digitally or hardcopy during low-altitude flight. The map will be of a scale and quality that terrain features, hazards, and chart annotations are of sufficient detail to allow navigation and safe mission accomplishment.

3.20.2.2.1. Annotate all maps with an abort altitude and brief the abort altitude prior to descending below 5,000 feet AGL.

3.20.3. **General Low-Altitude Procedures.**

3.20.3.1. Weather Minimums. Weather minimums for low-level training will be 3,000 feet ceiling and 5 miles visibility (as determined by the planned MTS camera source).

3.20.3.2. If unable to maintain positive visual terrain clearance using the available aircraft sensors, immediately climb to, or above, the briefed minimum altitude. Transition to a known flight reference to ensure expected aircraft attitude while climbing to the abort altitude. Maneuver the aircraft as necessary while climbing to the abort altitude to ensure terrain clearance.

3.20.3.3. Conduct low-level weapons delivery operations IAW AFTTP 3-1 and AFTTP 3-3.

3.20.3.4. Minimum flight airspeed during low-altitude flight/navigation is stall +10 KIAS (MQ-1 or +15 KIAS (MQ-9).

3.20.3.5. During all low-altitude operations, the immediate reaction to task saturation, diverted attention, or an emergency, is to climb.

3.20.3.6. The pilot will have a readily-available forward-facing camera source (nose camera [IR nose camera required for night] or payload position mode) visible at all times for terrain clearance reference. The forward-facing camera source may be displayed as

either the pilots HUD video source or displayed on the auxiliary monitors via framegrabber or other video display capability.

3.20.3.7. The crew will brief and discuss emergency mission management and the emergency mission start point prior to descending into the low-altitude environment. The emergency mission and emergency mission start point will be continuously updated to ensure the aircraft will remain clear of high terrain during any lost-link situation.

Chapter 4

INSTRUMENT/WEATHER PROCEDURES

4.1. Approach Category.

4.1.1. The MQ-1 is an approach category A aircraft.

4.1.2. The MQ-9 is an approach category B aircraft.

4.2. Weather Minimums, Restrictions, and Planning Factors.

4.2.1. Ceiling and Visibility.

4.2.1.1. Operating the aircraft below visual flight rules (VFR) minimums requires a published Airport Surveillance Radar or a Precision Approach Radar terminal approach procedure at the operating airfield. The MQ-1 INS/GPS and the MQ-9 INS/GPS are not certified for flying GPS instrument approaches.

4.2.1.2. When an alternate airfield is available, aircrews will operate IAW weather criteria defined in AFI 11-202V3. When an alternate airfield is not an option or not available, aircrews will comply with the following ceiling and visibility restrictions:

4.2.1.2.1. The worst weather (TEMPO or prevailing) must be at or above a ceiling of 800 feet or 500 feet above the lowest compatible published landing minima (whichever is greater), and a visibility of 2 miles or 1 mile above the lowest compatible published landing minima (whichever is greater). The weather must be at or above these minima at takeoff and be forecast to be at or above these minima at the estimated time of arrival (ETA) plus or minus one hour (± 1 hour). In all cases, with an operable MTS IR camera, the OG/CC can waive visibility requirements if weather is below minimums due to sand/dust only.

4.2.1.2.2. When the ceiling is below 3,000 feet or the visibility is below 3 miles, crewmembers will increase recovery fuel to allow the aircraft to hold for a minimum of two hours at best endurance, then penetrate and land with normal recovery fuel. This visibility requirement does not apply if the MTS IR camera is operable and visibility is below minimums due to sand/dust.

4.2.1.2.3. While airborne, adjust landing time (early or later) as necessary to ensure forecast weather for the ETA (± 1 hour) remains within the minima specified in [paragraph 4.2.1.2.1](#). If the aircrew is unable to adjust landing time to meet ETA buffer requirements, then terminate the mission so as to return the aircraft to the operating base with sufficient fuel to hold for a minimum of four hours then penetrate and land with normal recovery fuel.

4.2.1.2.4. While airborne, if the actual weather deteriorates below forecasted and is below the minima specified in [paragraph 4.2.1.2.1](#) at the actual time of arrival, pilots are authorized to fly to pilot weather category or published approach minimums, whichever is higher, if necessary to recover the aircraft.

4.2.1.3. Unit commanders will ensure that appropriate resources are in place at an airfield prior to designating the airfield as an alternate.

4.2.2. Turbulence.

4.2.2.1. Aircrews will not takeoff if forecast or reported severe turbulence for Light/Category I aircraft is present along the route of flight.

4.2.2.2. **CAUTION:** Pilots will limit exposure to turbulence to the maximum extent practical.

4.2.3. Wind.

4.2.3.1. Actual winds must be within flight manual limits at takeoff and landing. Forecast winds must be within flight manual limits at ETA (± 1 hour).

4.2.3.2. While airborne, if revised forecast winds for ETA (± 1 hour) exceed limits specified in the flight manual, the pilot will terminate the mission in time to return to the operating base before the forecast time of increased winds, or terminate the mission in time to return to the operating base with sufficient fuel to fly low approaches for a minimum of two hours (or as directed by Local Operating Procedures) unless a suitable alternate is available.

4.2.3.2.1. If sufficient fuel remains and mission allows, the pilot may establish a new ETA to overfly the forecast period of increased winds. The requirements of [paragraph 4.2.3.2](#) must be complied with for any updated ETA.

4.2.3.3. Aircrew may use the steady state wind velocity and predominant wind direction to assess if winds are forecast within flight manual limits. In the event that worst case conditions of gust and/or variability exceed flight manual limits, continue the mission, but fuel reserves shall be adjusted to return to the operating base with sufficient fuel to fly low approaches for a minimum of two hours (or as directed by Local Operating Procedures) and land with normal fuel reserves.

4.2.4. **Emergency Mission/Lost Link Planning.** Pilots will maintain awareness of current and forecast weather along the planned route of flight, the Lost Link/Emergency Mission route of flight, and the intended landing field by all available means. The emergency mission route will be updated to account for weather hazards, threats, terrain, and restricted airspace along the proposed route of flight. The route will be altered if necessary using care to select appropriate aircraft parameters to avoid hazardous weather conditions while complying with Air Traffic Control clearances.

4.3. Adverse Weather Operating Procedures.

4.3.1. **Rain, Snow, Freezing Precipitation, and Frost.** Pilots will not takeoff with frost, ice, or snow accumulation on the wings. Whenever the outside air temperature is less than 40 degrees Fahrenheit /5 degrees Centigrade, or the pilot is concerned about frost, ice, or snow, apply an ice retardant to the wings or inspect the aircraft for frost immediately prior to takeoff.

4.3.2. Precipitation adversely affects aircraft performance and reduces visibility. If conditions permit, pilots should minimize exposure to all types of precipitation during all phases of flight. If precipitation cannot be avoided, pilots should maximize climb or descent rate to exit potential or actual icing conditions.

4.3.3. Pilots should not conduct flight into forecast moderate or worse icing and will minimize conduct of flight into known icing conditions to the maximum extent possible. If encountering icing, pilots should maneuver the aircraft to exit the icing conditions. Consideration will be given to turning the EO/IR sensor aft to prevent ice formation on the lens face and thus allow use of the sensors to scan flight surfaces and the visual ice detector for ice build-up.

4.3.4. Runway/Taxiway Conditions.

4.3.4.1. Units will specify minimum runway condition reading (RCR) for taxi operations. Do not takeoff or land with an RCR less than 12 (waiver authority is OG/CC). When no RCR is available, refer to International Civil Aviation Organization conversions in the Flight Information Handbook.

4.3.4.2. Handling characteristics of the MQ-1 and MQ-9 on ice or snow are not optimum. On ice and/or snow, pilots will minimize throttle setting to that required to move (or sustain movement of) the aircraft and limit taxi speed to no more than 5 KGS. If required to stop, plan to stop over clear portions of the taxiway, if able. MQ-9 pilots will avoid using reverse thrust in areas of loose snow, ice and sand.

4.3.5. Thunderstorms. The PIC will not operate the aircraft within 25 NM of known thunderstorm activity.

Chapter 5

AIR-TO-AIR OPERATIONS

5.1. References. AFI 11-214, *Air Operations Rules and Procedures*, contains air-to-air procedures applicable to all aircraft. This chapter specifies additional procedures or restrictions which are applicable to MQ-1 and MQ-9 operations.

5.2. Coordination. A coordination brief between all involved players shall include the following: altitude deconfliction, emergency mission/lost link explanation and deconfliction, and AFI 11-214 Air-to-Air Training Rules.

5.3. Maneuvering Limitations. Minimum airspeed during maneuvering is stall +10 KIAS (MQ-1) or stall +15 KIAS (MQ-9).

Chapter 6

AIR-TO-SURFACE OPERATIONS

6.1. References. AFI 11-214 contains air-to-surface procedures applicable to all aircraft. Also reference AFI 13-212, *Range Planning and Operations*, applicable range supplement and AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*. This chapter specifies procedures or restrictions applicable to MQ-1 and MQ-9 operations. On OT&E sorties, specific portions of this chapter may be waived by instructions contained in the operations order, test plan, or implementation message which directs the test.

6.2. Target Identification. Crews must positively identify the target prior to weapons release. For wartime or contingency sorties, comply with SPINS/theater Rules of Engagement (ROE). For training sorties, achieve positive identification either visually or by confirming target location through valid on-board/off-board cues. Examples of available means include, but are not limited to: marking rounds, IR pointers, synthetic aperture radar (SAR), MTS, map plots, data links, radio communications, talk-ons with joint terminal attack controllers (JTAC), RCOs, other aircrew members, etc. Pilots will ensure they completely understand how coordinates and elevation for their target(s) were generated and that use of this data is in compliance with all range procedures or Rules of Engagement.

6.3. Weather Minimums. Basic weather minimums established in AFI 11-214 apply.

6.3.1. For IMC deliveries, deliveries through an undercast, and level deliveries above 5,000' AGL, there are no minimum weather requirements for weapons delivery provided the restrictions of [paragraph 6.4.1](#) are complied with, as required.

6.4. Live/Heavyweight Ordnance Procedures.

6.4.1. **IMC Weapons Deliveries.** Pilots may release live or inert weapons in or thru IMC IAW the following procedures, unless restricted by range procedures or theater ROE (verification requirements against known target coordinates only applies to training sorties):

6.4.1.1. **(MQ-9 only)** Ballistic Ordnance releases.

6.4.1.1.1. Verify stores management system (SMS) target coordinates against known target coordinates prior to release.

6.4.1.1.2. Ensure weather minimums will allow for minimum of 8 seconds of available guidance time from buddy lase platform and/or ground party lasing the target.

6.4.1.2. **(MQ-9 only)** Inertially Aided Munitions (IAM).

6.4.1.2.1. Verify SMS target coordinates against known target coordinates prior to release.

6.4.1.2.1.1. SAR derived KAATS target coordinates may be used. For training, verify the final KAATS derived coordinates against known target coordinates prior to release if available.

6.4.2. **(MQ-9 only) Inertial Aided Munitions (IAM) Bomb on-coordinate release / Coordinate only releases:** Before releasing live or inert IAMs in a bomb-on-coordinate

mode or employing any ordnance in a system delivery mode using coordinates only (i.e. manually created target) verify Navigation system accuracy within 15 minutes of release by confirming GPS Figure of Merit (FOM) less than or equal to 5.

6.5. Battle Damage/Weapons Checks. Crews will perform a battle damage/weapons check of weapons stations prior to or during return to base (RTB). This check is mandatory following expenditure of live ordnance. If unable to complete check using organic sensors, ensure dearm crew checks aircraft before taxiing to populated area.

6.6. Simulated Attacks Against Off-Range or Manned Targets. May be conducted under the following restrictions:

6.6.1. For wartime or contingency sorties, comply with theater SPINS/ROE. If no theater SPINS/ROE exists, follow training sortie rules.

6.6.2. For training sorties:

6.6.2.1. No live or heavyweight inert air-to-ground (A/G) ordnance (unless pinned), or live A/G missiles are loaded.

6.6.2.2. The combat laser may be used only in approved areas. Do not arm the laser unless in approved areas and cleared for use.

6.7. (MQ-9 only) Procedures for carrying live or inert GBU 12/38 ordnance. Procedures for carrying live or inert GBU 12/38 ordnance in conjunction with cocked Linear Electromechanical Actuators (LEMAs) on empty stations. **WARNING:** There is no overt indication on the pilot heads-up display (HUD) or stores management system (SMS) screens that differentiate between live, inert, or simulated GBU 12/38 ordnance to include empty stations with cocked LEMAs. To prevent inadvertent selection and release of live or inert ordnance, aircrew will adhere to the following procedures:

6.7.1. If live or inert GBU 12/38 ordnance is being carried in conjunction with a cocked LEMA on any empty station, live or inert weapons must be loaded on the inboard stations first. Cocked LEMAs will be configured primarily on outboard stations. If a single live or inert weapon is carried, it will be loaded on station 5, and LEMAs may be cocked on all empty stations (including station 3). If three lives or inerts are carried, station 2 will be used to load the outboard live/inert, and station 6 will be used for the cocked LEMA.

6.7.2. All dry attacks will be conducted with the cocked LEMA selected. At no time will crews select the live or inert inboard stations until ready to release the live or inert ordnance.

6.7.3. The cocked LEMA station(s) will not be activated (“fired”) until all live or inert ordnance has been visually confirmed released with the Multi-Spectral Targeting System (MTS).

6.8. Master Arm switch. When carrying releasable ordnance, configure IAW 11-214.

6.8.1. For multiple weapons release passes, Master Arm switch may remain “Armed” unless further restricted by range guidance or theater ROE. (EXCEPTION: for training sorties, if the aircraft does not remain within restricted airspace or overflies “manned” sites during any maneuvering for subsequent passes, then “safe” the master arm switch between passes.)

6.8.2. The use of Master Arm and release switches is authorized when not carrying releasable ordnance. When carrying releasable ordnance, remain two switch positions away from release at all times prior to intentionally releasing live or inert ordnance. The two deselected switches will be the master arm switch and the trigger.

Chapter 7

ABNORMAL OPERATING PROCEDURES

7.1. General. This chapter contains procedures to follow when other-than-normal circumstances occur. The procedures in this chapter do not replace or supersede procedures contained in the flight manual or the use of sound judgment. In all cases, data loggers and video should be saved for review and analysis until released by the appropriate maintenance personnel.

7.1.1. Pilots will not accept an aircraft for flight with a malfunction that is addressed in the emergency section of the flight manual until maintenance personnel accomplish appropriate corrective actions.

7.1.2. Once a malfunctioning system is isolated, pilots will not use that system again unless its use in a degraded mode is essential for recovery. If the fault is corrected or malfunctioning item is reset, crews may continue the flight or use of the system unless prohibited by the flight manual.

7.2. Ground Emergencies.

7.2.1. Pilots will not taxi with nose-wheel steering, brake system, video path, or telemetry/datalink malfunctions.

7.2.2. In the event of an inadvertent entry onto soft or unprepared surfaces, pilots will not attempt to recover the aircraft to the prepared surface by using engine power and/or differential braking.

7.3. In-flight Emergencies.

7.3.1. **Air Aborts.** Abort the mission, regardless of apparent damage or subsequent normal operation, if any of the following occur: bird strike, Over-G, flight control system anomalies (including uncommanded flight control inputs), or engine failure.

7.3.2. **Landing Gear Malfunctions.** If encountering a landing gear malfunction and the gear are down, leave them down and do not make touch and go landings.

7.3.3. **Forced Landing.** Comply with forced landing procedures in the flight manual. If a Ku-band forced landing to a runway or primary site cannot be completed without endangering personnel or property on the ground, then another site will be selected even if attempting a landing at that alternate site may result in destruction of the aircraft.

7.4. Armament System Malfunctions.

7.4.1. **Inadvertent Release.** If able, record switch positions at the time of inadvertent release and provide to armament and safety personnel. Safe all switches. Record the impact point, if known. If equipment failure is suspected, do not attempt further release in any mode. For suspected equipment failures, follow hung ordnance procedures and RTB.

7.4.2. **Failure to Release/Hung Ordnance.** If ordnance fails to release when all appropriate switches are set, note position of all release and fusing switches, and when operational constraints permit, set them to safe. Refer to TO 1Q-1(M)B-34-1-1 or TO 1Q-9(M)A-34-1-1 as applicable.

Chapter 8

LOCAL PROCEDURES

8.1. General. This chapter is for unit local operating procedures. Procedures herein will not be less restrictive than those contained elsewhere in this regulation, nor will this chapter be a single-source document for procedures contained in other directives or regulations. Avoid unnecessary repetition of guidance provided in other established directives; however, reference to those directives is acceptable when it serves to facilitate location of information necessary for local operating procedures. Follow instructions on page 1 of this volume for approval/distribution of supplements. Individual squadron Local Operating Procedures are required for all units. If more than one squadron is co-located at the same installation, only one Chapter 8 is required and will be approved by the OG/CC.

8.2. Format. Organize the local chapter in the following format to include, but not limited to, the following:

- 8.2.1. Introduction
- 8.2.2. General Policy
- 8.2.3. Mission Planning
- 8.2.4. Ground Operations
- 8.2.5. Flying Operations
- 8.2.6. Local Airspace Procedures
- 8.2.7. Weapons Employment
- 8.2.8. Abnormal Procedures
- 8.2.9. Attachments (Illustrations)

8.3. Content. The local chapter will include procedures for the following, if applicable:

- 8.3.1. Local Area Procedures.
 - 8.3.1.1. ATC procedures.
 - 8.3.1.2. Traffic pattern and airfield procedures.
 - 8.3.1.3. Local gunnery and range procedures/restrictions.
- 8.3.2. Controlled Emergency Landing Areas/Procedures.
 - 8.3.2.1. Hung Ordnance/Weapons Malfunction Recovery.
- 8.3.3. Local Weather Procedures.
- 8.3.4. Approved Alternate Missions.

8.3.5. Unit Standards.

8.3.6. Initial Lost Link Altitude.

BURTON M. FIELD, Lt Gen, USAF
DCS, Operations, Plans and Requirements

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

- AFPD 11-2, *Aircrew Operations*, 19 January 2012
- AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, 19 January 2012
- AFI 11-202V3, *General Flight Rules*, 22 October 2010
- AFI 11-2MQ-1V1, *MQ-1—Aircrew Training*, 21 Jan 2010
- AFI 11-2MQ-9V1, *MQ-9—Crew Training*, 3 June 2008
- AFI 11-2MQ-1V2, *MQ-1—Crew Evaluation Criteria*, 28 Nov 2008
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- AFI 11-214, *Air Operations Rules and Procedures*, 14 Aug 2012
- AFI 11-215, *USAF Flight Manuals Program (FMP)*, 22 Dec 2008
- AFI 11-218, *Aircraft Operations and Movement on the Ground*, 28 Oct 2011
- AFI 11-401, *Aviation Management*, 10 Dec 2010
- AFI 13-212, *Range Planning and Operations*, 16 Nov 2007
- AFI 21-101, *Aircraft and Equipment Maintenance Management*, 26 July 2010
- AFI 33-360, *Publications and Forms Management*, 18 May 2006
- AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*, 11 Nov 1994
- AFMAN 11-217V3, *Supplemental Flight Information*, 23 Feb 2009
- AFMAN 33-363, *Management of Records*, 1 March 2008
- AFTTP 3-1.Predator, *Tactical Employment MQ-1 (S)*, 30 September 2011
- AFTTP 3-3.Predator, *Combat Aircraft Fundamentals MQ-1*, 30 September 2011
- AFTTP 3-1.MQ-9, *Tactical Employment MQ-9 (S)*, 15 September 2010
- AFTTP 3-3.MQ-9, *Combat Aircraft Fundamentals MQ-9*, 15 September 2010
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Adopted Form

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ACC—Air Combat Command

AF—Air Force

AFSOC—Air Force Special Operations Command

AGL—above ground level

A3—Director of Air and Space Operations or Operations Officer

CAP—Critical Action Procedure

CRM—Crew Resource Management

CSAR—Combat Search and Rescue

EEI—essential elements of information

EO—electro-optical

ETA—estimated time of arrival

FAF—Final Approach Fix

FENCE—Fuel, Emitters, Navigation, Communication, and Engage

FLIP—Flight Information Publication

FMM—Flight Manual Manager

FOM—Figure of Merit

FOS—Flying Operations Supervisor

FPM—feet per minute

GCS—ground control station

GPS—Global Positioning System

HQ—headquarters

IAW—in accordance with

IFF—identification friend or foe

INS—inertial navigation system

IP—instructor pilot

IR—infrared

ISO—instructor sensor operator

KGS—knots ground speed
LOWAT—Low-Altitude
LRE—Launch and Recovery Element
MAJCOM—major command
MCE—Mission Control Element
MD—mission director
MSA—minimum safe altitude
MTS—Multispectral Targeting System
MUX—multiplexer
NM—nautical mile
NOTAM—Notice to Airmen
OGV—Operations Group standardization and evaluation
OPR—office of primary responsibility
ORM—Operational Resource Management
OSC—on-scene commander
PIC—Pilot in Command
PSO—Pilot/Sensor Operator
RCC—Rescue Coordination Center
RCR—runway condition reading
ROZ—restricted operations zone
SAR—synthetic aperture radar
SFO—simulated flame-out
SMS—stores management system
SO—sensor operator
SQ/DO—Squadron Operations Officer
TEMPO—temporary
TOLD—takeoff and landing data
USAF—United States Air Force

Terms

Bingo Fuel—A pre-briefed fuel state that allows the aircraft to return to the base of intended landing using preplanned recovery parameters and arriving with normal recovery fuel.

Critical Phases of Flight—Taxi, takeoff, approach, and landing; LRE/MCE handoff operations; and terminal attack sequence (maneuver-to-attack to weapons impact both actual and simulated) are critical phases of flight.

Hung—A hung store condition exists when a bomb has been commanded to release from the aircraft, but fails to physically release.

Joker Fuel—A pre-briefed fuel needed to terminate an event and proceed with the remainder of the mission.

LRE—Launch and Recovery Element. Deployed personnel based at a forward location who are responsible for the launch, recovery and ground support of the aircraft. Launch and recovery is accomplished using an LRGCS or GCS.

LRGCS—Launch and Recovery Ground Control Station. A modified GCS configuration equipped with the functionality of two PSO racks and associated systems, a communications interface and a GDT. Mission systems are not part of the configuration and an LRGCS is not intended to retain any SATCOM capability.

MCE—Mission Control Element. A GCS (usually established in a geographically separated location) responsible for taking an aircraft from an LRE following takeoff, executing the mission, and then handing the aircraft back to the LRE for recovery and landing.

MSA—minimum safe altitude—The higher of a) 1,000 feet above the highest obstacle within 5 NM of route of flight, or b) as locally established.

Minimum Crew—Minimum GCS crew to operate the aircraft during non-critical phases of flight is a single pilot. A Sensor Operator or extra pilot is required during critical phases of flight. During live/actual weapons employment involving a laser, a Sensor Operator must operate the laser.

Normal Recovery Fuel—The fuel amount at the commencement of the initial approach or at the FAF at the base of intended landing or alternate (if required).

Phase Manual—Phase manuals are “how to” documents that expand on basic procedures in flight manuals and applicable USAF instructions. Training units may develop these manuals to enhance volume and provide student crewmembers with explanatory study material. Phase manuals provide complementary and/or more detailed aircraft maneuver or systems operation descriptions than flight manuals and/or USAF instructions.

Remote Split Operations (RSO)—Use of LRE and MCE to conduct operations. MCE can reside within same theater of operations or be established at a CONUS or separate OCONUS location. RSO is extremely communication intensive and requires careful coordination between LRE and MCE when conducting operations.

Attachment 2**MISSION/CREW BRIEFING GUIDE****A2.1. Mission Overview:**

- A2.1.1. Time Hack
- A2.1.2. Roll Call
- A2.1.3. Mission/Training Objectives
- A2.1.4. Call Sign
- A2.1.5. Pilot in Command
- A2.1.6. Step/start/takeoff/land/changeover times
- A2.1.7. Go/No Go items
- A2.1.8. ORM
- A2.1.9. Special Interest Items

A2.2. Flight Planning:

- A2.2.1. Tail #
- A2.2.2. Configuration
- A2.2.3. Aircraft Status
- A2.2.4. Ramp Weight
- A2.2.5. Spare
- A2.2.6. TOLD

A2.3. Weather:

- A2.3.1. Takeoff/Departure
 - A2.3.1.1. Surface Winds
 - A2.3.1.2. Ceiling and Visibility
 - A2.3.1.3. Hazards
- A2.3.2. Enroute Weather
- A2.3.3. Arrival/Approach
 - A2.3.3.1. Surface Winds
 - A2.3.3.2. Ceiling and Visibility
 - A2.3.3.3. Hazards

A2.4. Airfield/Airspace:

- A2.4.1. Airfield/Airspace NOTAMs
- A2.4.2. Airfield Restrictions

- A2.4.3. Comm Plan/Datalink Assignment
- A2.4.4. Enroute Airspace
- A2.4.5. Airspace Coordination
- A2.4.6. Range/Restricted Operations Zone (ROZ)
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 - A2.4.6.2. Altitude
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A2.5. Tactical Admin:

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- A2.5.2. Ops/FENCE Checks/MESL
- A2.5.3. Controlling Agency Check-In/Coordination
- A2.5.4. SPINS/ROE
- A2.5.5. Training Rules
- A2.5.6. Egress Routing/Altitude/Airspeed
- A2.5.7. Battle Damage/Weapons Check
- A2.5.8. Approach and Landing
- A2.5.9. After Landing/De-Arm
- A2.5.10. Emergency/Alternate Airfield/Wounded Bird

A2.6. Intelligence:

- A2.6.1. General Situation
- A2.6.2. General Target Information
- A2.6.3. Threat Analysis
- A2.6.4. Reporting Requirements

A2.7. Targets/Tactics:

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- A2.7.2. Target Coordinates
- A2.7.3. Target Descriptions
- A2.7.4. EEIs
- A2.7.5. Detection concerns
- A2.7.6. Threat Countertactics/Reactions
- A2.7.7. Sensor Plan/Tactics

A2.7.7.1. Environmental (sun angle, thermal cross-over, smoke, haze, fog, other obscurations)

A2.7.7.2. Target priorities and prosecution order

A2.7.7.3. Aircraft positioning/emergency mission

A2.8. Attack Specifics:

A2.8.1. Attack Overview

A2.8.2. Attack Plan

A2.8.3. Run-In/CDE/TOT Restrictions

A2.8.4. Weapon/Laser Set-Up

A2.8.5. Clearance to Engage

A2.8.6. Release Criteria

A2.8.7. Abort/Shift Options

A2.8.8. Comm Flow

A2.8.9. Egress/Reattack

A2.8.10. BDA

A2.8.11. Contingencies

A2.9. Crew Duties and Responsibilities:

A2.9.1. Crew Coordination/CRM.

A2.9.2. Takeoff / Departure Plan

A2.9.3. Sensor Operator Responsibilities / Calls

A2.9.4. Recovery / Landing

A2.9.4.1. Routing

A2.9.4.2. Coordination

A2.9.4.3. GLS Parameters

A2.9.4.4. Go Around

A2.10. Alternate Mission:

A2.11. Collision Avoidance:

A2.12. Contingencies:

A2.12.1. Lost Link/Emergency Mission

A2.12.2. Weather

A2.12.3. Emergency Actions and Intentions

A2.12.3.1. Takeoff Emergencies / Abort Points

A2.12.3.2. Enroute Emergencies

A2.12.3.3. Recovery / Landing emergencies

A2.12.3.4. Hung Ordinance

A2.13. Debrief time/place:

A2.14. Supported unit debrief (if required):

Attachment 3**CHANGEOVER BRIEFING GUIDE****A3.1. Mission Update. (P, SO)**

A3.1.1. Current target information or Next target status (P, SO)

A3.1.2. Target Deck Status (P, SO)

A3.2. Current Clearance. (P, SO)

A3.2.1. Airspace (P, SO)

A3.2.2. Altitude Block (P, SO)

A3.2.3. Altimeter (P)

A3.2.4. Time Remaining (P, SO)

A3.2.5. High Terrain/Minimum Safe Altitude (P, SO)

A3.2.6. Divert Field (P)

A3.2.7. Identification Friend or Foe (IFF) (P)

A3.3. Position of other aircraft in vicinity (P)**A3.4. Weather Update. (P, SO)**

A3.4.1. Enroute (P)

A3.4.2. Recovery airfield (P)

A3.5. Emergency Mission Information. (P)**A3.6. Initial Lost Link Heading and Altitude (P)****A3.7. Current Multiplexer (MUX). (P, SO)****A3.8. Data Link Configuration. (P, SO)**

A3.8.1. Status of link (P)

A3.8.2. Datalink trend information (P)

A3.8.3. Encryption (P)

A3.9. System status. (P, SO)

A3.9.1. Fuel status (P)

A3.9.2. Aircraft status (P, SO)

A3.9.3. Weapon status (P, SO)

A3.9.4. GCS status (P, SO)

A3.10. Complete Paperwork. (P, SO)

A3.10.1. Log Flight Time (P, SO)

A3.10.2. Log Training Events (P, SO)

A3.10.3. Log Aircraft/GCS Write-ups (P, SO)

Attachment 4**MISSION/CREW DEBRIEFING GUIDE****A4.1. Ground Procedures****A4.2. Takeoff/Departure****A4.3. En Route Procedures****A4.4. Recovery/Landing/After Landing****A4.5. General:**

A4.5.1. SIIs

A4.5.2. Radio Procedures

A4.5.3. CRM/Crew Coordination

A4.6. Mission Accomplishment/Analysis:

A4.6.1. Mission Reconstruction

A4.6.2. Mission Support

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A4.6.4. Tactical Employment Results

A4.6.5. Learning Objectives Achieved

A4.6.6. Execution Errors

A4.6.7. Lessons Learned

A4.6.8. Recommendations for Improvement

A4.7. Comments/Questions

Attachment 5

COMBAT SEARCH AND RESCUE/ON-SCENE COMMANDER CHECKLIST

A5.1. Combat Search and Rescue (CSAR)/On-Scene Commander Checklist. Refer to AFTTP 3-1.MQ-1/9 for CSAR checklist and procedures.