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Flying Operations

MQ-9—OPERATIONS PROCEDURES

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This publication implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations*, AFPD 11-4, *Aviation Service*, and AFPD 14-4, *Management of the Air Force Intelligence, Surveillance, Reconnaissance and Cyber Effects Operations Enterprise*. It supports Air Force Manual (AFMAN) 11-202, Volume 3, *Flight Operations*. This publication applies to all civilian employees and uniformed members of the Regular Air Force, Air Force Reserve, and Air National Guard (ANG) conducting MQ-9 operations. This publication does not apply to the United States Space Force. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with (IAW) the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the Department of the Air Force (DAF) Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through major command (MAJCOM) channels to the OPR. This publication may be supplemented at any level. See **paragraph 1.3** for specific requirements for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See Department of the Air Force Manual (AFMAN) 90-161, *Publishing Process and Procedures*, **Table A10**, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor's commander for non-tiered compliance items. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. Major changes include: multiple administrative changes (AFI to AFMAN, etc), added automatic takeoff and landing considerations throughout (paragraphs **1.4**, **2.1.3**, **3.6.2**, **3.8.1**, **3.8.2**, **3.8.3**, **3.9.2**, **3.10**, **4.2**), added divert considerations throughout, updated right/left seat considerations, updated departure brief considerations, updated minimum speeds for simulated flame-out, low-altitude, and air-to-air; updated weather guidance throughout **paragraph 4.2**, updated guidance for unexpended ordnance, incorporated guidance from current thunderstorm waiver, revised language on simulated attacks with live/inert ordnance, addition of laser training mode operations, **Chapter 8** guidance for frequency deconfliction, unexpended ordnance, and divert planning; updated currency requirements (**Table 4.1**) and sortie/mission/events definitions (**Attachment 1**), re-inserted **Attachment 2** from archived AFI 11-2MQ-1/9 Volume 3, updated Extended Range (ER) guidance (**Attachment 3**), added automatic takeoff and landing programmatic guidance (**Attachment 6**), and updated T-coding throughout the document.

Chapter 1

GENERAL INFORMATION

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

1.1.1. Commanders. Commanders at their respective tier levels are responsible for complying with guidance in this manual. (**T-2**) MQ-9 flying unit wing commanders, delegated no lower than Operations Group Commander (OG/CC) (or equivalent), are responsible for providing local operating guidance to supplement the requirements of this manual. (**T-2**)

1.1.2. Pilot in Command (PIC). When the aircrew complement contains more than one qualified pilot, the aircrew will identify the PIC prior to assumption of aircraft control. **(T-2)** PIC responsibilities and authorities are defined in AFMAN 11-202V3. The PIC may change during missions as pilots cycle in and out of the ground control station (GCS).

1.1.3. Individual Aircrew. Aircrew must have a thorough working knowledge of all procedures included in this volume that are applicable to their aircrew position. **(T-2)**

1.1.4. Aircrew Positions. 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 controlling the aircraft will occupy the left seat unless equipment malfunctions dictate use of the right seat. **(T-3)**

1.2. Waivers. Unless another approval authority is cited, waiver authority for this volume is the Major Command (MAJCOM) Director of Operations (MAJCOM/A3), or Commander Air Force Forces (COMAFFOR) for those aircrew and assets under COMAFFOR oversight. COMAFFOR should notify Air Combat Command Director of Operations (ACC/A3) of waivers within 72 hours of approval. All approvals should include an expiration date. Air Combat Command MQ-9 Operations Branch (ACC/A3MQ) and Air Combat Command Standardization and Evaluation Branch (ACC/A3TV) maintain office of collateral responsibility on all waiver requests to this AFMAN.

1.3. Supplements to this Publication. MAJCOM, direct reporting unit (DRU), and field operating unit (FOA) personnel will forward proposed MAJCOM/DRU/FOA-level supplements to this volume to Air Combat Command Persistent Attack and Reconnaissance Division (ACC/A3M) for coordination and approval prior to publication IAW AFPD 11-2. **(T-1)**

1.3.1. Copies of MAJCOM/DRU/FOA-level supplements, after approved and published, will be provided by the issuing MAJCOM/DRU/FOA to the Air Force Flight Standards Agency Flight Directives (AFFSA/XOF), ACC/A3MQ and ANG offices of primary responsibility. **(T-1)** Field units below MAJCOM/DRU/FOA level forward copies of their supplements to this publication to their parent MAJCOM/DRU/FOA OPR for post-publication review.

1.3.2. MAJCOM specific guidance is embedded within the text and prefaced with the MAJCOM acronym. For the purposes of this instruction, the National Guard Bureau (NGB) is considered a MAJCOM.

1.4. Automatic Takeoff and Landing Capability (ATLC) and SATCOM L/R Considerations. ATLC fielding requires a phased implementation utilizing conventional Launch

and Recovery Element (LRE) and ATLC based operations concurrently. ATLC additions have been made throughout this instruction, as well as AFMAN 11-2MQ-9 Volume 1, *MQ-9—Aircrew Training* and AFMAN 11-2MQ-9, Volume 2, *MQ-9—Aircrew Evaluation Criteria*. Programmatic guidance for ATLC implementation have been added in **Attachment 6** to assist commanders in managing ATLC risk during implementation. Aircrew require a mindset shift away from a traditional Launch and Recovery Element (LRE)/Mission Control Element (MCE) model. For ATLC implementation, Launch/Recovery (LR or L/R) no longer refers to traditional Line of Sight (LOS) operations via LRE. L/R may now reference both LRE and MCE operations. Use "LOS L/R" to refer to traditional LRE operations, and use Satellite Communications (SATCOM) L/R "SATCOM L/R" for automatic L/R operations for both MCE and LRE.

Chapter 2

MISSION PLANNING & BRIEFING

2.1. Duties. The responsibility for mission planning and mission preparation are shared jointly by the individual aircrew and the operations and intelligence functions of the organization.

2.1.1. The PIC is ultimately responsible for mission planning and ensures all aircrew are briefed prior to assuming command of the aircraft. Pilots 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. Aircrew will not fly un-briefed missions and/or events. **(T-3)** If operationally necessary, missions may be modified while the aircraft is airborne as long as changes do not compromise flight safety. The PIC ensure all aircrew are aware of and acknowledge any changes.

2.1.3. Aircrew complete sufficient flight planning to ensure safe mission accomplishment. Units will ensure areas covered include, at a minimum: Weather, emergency mission setup, fuel requirements, mission objectives, stores configuration (if applicable), communication procedures, divert locations, and risk management (include takeoff and landing data, departure and arrival procedures for all missions, and a threat study when applicable). **(T-3)**

2.2. Briefing and Debriefing.

2.2.1. Briefing Guides. A sample mission/crew briefing guide is found in **Attachment 2**. At a minimum, all Mission Briefings and Changeover Briefings will include the list of items in **paragraph 2.1.3** Additional suggested briefing guides are found in Air Force Tactics, Techniques, and Procedures (AFTTP) 3-3.MQ-9, *Combat Aircraft Fundamentals MQ-9*. The PIC or other members of the aircrew adequately brief applicable items and field questions to clarify uncovered or unclear items. 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."

2.2.2. Briefing Times. Aircrew will ensure enough time is allotted so that mission briefings, aircrew briefings, and changeover briefings cover all required items and provide enough time to transition between events. **(T-3)**

2.2.3. Mission Briefing. The PIC will brief participating aircrew to ensure safe and effective mission accomplishment. **(T-3)** The PIC will ensure briefings are tailored to accommodate the experience level and capabilities of each aircrew member participating in the mission. **(T-3)**

2.2.3.1. Aircrew scheduled to fly the mission will attend a mission briefing. **(T-3)** Units may cover items from the mission/crew briefing guide in a mass setting conducted by the operations supervisor (Air Force Special Operations Command (AFSOC): mission director (MD), or flying operations supervisor (FOS) as applicable). Aircrew that did not attend a mission briefing will obtain operations supervisor/MD/FOS (as applicable) approval prior to participating in a flight. **(T-3)** The PIC will ensure aircrew participating in a flight under operations supervisor, MD, or FOS approval are adequately briefed prior to assuming aircrew duties. **(T-3)**

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

2.2.4. Changeover Briefing. Individual aircrew will complete a changeover briefing for each aircrew position changeover. **(T-3)** Position-specific changeover briefings will not be accomplished simultaneously. **(T-3)** Aircrew specific changeover briefs may be done IAW squadron standards.

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

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

2.2.4.3. Change out one aircrew position 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 aircrew positions.

2.2.5. Mission Debrief. Following aircrew changeover or landing, all participating aircrew will debrief mission elements. **(T-3)**

Chapter 3

NORMAL OPERATING PROCEDURES

3.1. Ground Control Station (GCS).

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 instructor pilot-supervised student pilots may fly the aircraft. The PIC will ensure there are no unapproved occupants in a primary crew position unless participating in an orientation flight IAW DAFMAN 11-401, *Aviation Management*. **(T-3)**

3.1.2. Aircrew entering a GCS will attempt to notify the occupying aircrew prior to entry and minimize impact on aircrew in critical phases of flight. **(T-3)**

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 and support personnel on GCS entry procedures during local area orientation. **(T-3)**

3.1.3. Aircrew will not place items (checklists, charts, etc.) behind the condition lever, throttle, flap lever, or speed lever at any time. **(T-3)** Aircrew will ensure no items interfere with aircraft controls or the head-down display (HDD). **(T-3)**

3.1.4. Unit commanders will ensure all aircrew participating in missions are focused on their in-flight responsibilities and not tasked with other duties while the mission is underway. **(T-3)**

3.1.5. While in the GCS, aircrew will only operate electronic devices necessary for safety of flight or the accomplishment of the mission. **(T-3)**

3.1.6. The PIC will ensure the GCS is properly secured after each mission to include the removal and/or securing of all classified materials. **(T-3)**

3.1.7. Aircrew will use all available cockpit recording devices to the maximum extent possible. **(T-3)**

3.2. Required Equipment. Information detailing the required GCS equipment for flight is found in AFMAN 11-202V3. Additionally, the equipment listed in this paragraph is required for initial takeoff. If the equipment fails while airborne, the PIC determines whether to continue the mission.

3.2.1. Aircraft are required to have two separate cameras for flight. This requirement will include at least one nose camera. **(T-3)**

3.2.2. All inertial navigation system (INS)/global positioning system (GPS) navigational systems must be operational at takeoff. **(T-3)** If an INS/GPS unit fails once airborne, the PIC may decide to continue the mission, provided that a minimum of two INS/GPS units are fully functional and the loss of one INS/GPS unit does not adversely affect mission accomplishment.

3.2.3. For missions that will include a portion of the flight during periods of night as defined by AFMAN 11-202V3, aircraft will have at least one approved infrared (IR) video camera. **(T-3)**

3.2.4. The aircraft and/or cockpit must have an operable radio or alternate means of communication (e.g., multi-user Internet Relay Chat (mIRC), land line, satellite phone) suitable for mission accomplishment and real-time air traffic control (ATC) and/or control and reporting center (CRC) coordination. **(T-3)**

3.2.5. The GCS will have a functional telephone available as a back-up means of communication when flying in controlled airspace. **(T-3)**

3.2.6. Minimum GCS aircrew to operate the aircraft during non-critical phases of flight is a single current, qualified pilot. During non-critical phases of flight above 2,000 feet above ground level (AGL), the sensor operator (SO) seat may be unoccupied. During critical phases of flight (see **Attachment 1**, Terms), a current, qualified SO or supervised student must be in the SO seat. **(T-3)** (**Exception:** Unit commanders may designate, by name in writing, pilots who are authorized to occupy the SO seat during critical phases of flight). During live and/or actual weapons employment or laser operations, a qualified or upgrading sensor operator must operate the laser. **(T-2)**

3.3. Communications. Units should tailor communications equipment use to mission specifications and unit needs.

3.3.1. Ground Communication. The PIC will ensure two-way communication is established with the ground crew prior to all ground checks and maintained until the PIC releases the ground crew. **(T-3)** Any time the aircraft's engine is operating on the ground, the PIC will ensure two-way communication with applicable ground control in addition to the ground crew. **(T-3)**

3.3.2. In-flight Communications.

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

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

3.3.2.1.2. The SO notifies the PIC immediately upon seeing a potential air traffic conflict, airspace deviation, deteriorating/un-briefed weather conditions, or potential terrain or obstruction clearance conflict. In addition, the SO should notify the PIC upon noticing a deviation.

3.3.2.1.3. The PIC announces all master arm activations and deactivations.

3.3.2.2. Aircrew monitor the intercom and aircraft radio to the maximum extent possible, and will announce when not monitoring appropriate channels, and again when resuming monitoring. In cases where the capability exists to connect with the intercom system of a different cockpit, aircrew announce their presence on intercom IAW unit guidance.

3.3.2.3. Before making any camera changes or multispectral targeting system (MTS) manipulation below 2,000 feet AGL, each aircrew position announce, and the other aircrew position acknowledge, the change.

3.3.2.4. The PIC announces, and the SO acknowledges, when departing altitude for a climbing or descending altitude.

3.3.2.5. The SO informs the PIC of all HDD caution and warning messages during non-critical phases of flight. Pilots briefs the HDD messages the SO will call out during critical phases of flight.

3.4. Checklists.

3.4.1. Aircrew will reference applicable checklists during all phases of flight. **(T-3)** The PIC is responsible for checklist completion. Electronic checklists are authorized for use, however units must have spare electronic or paper copy checklist available to the aircrew should failure of the primary checklist source occur. **(T-3)**

3.4.2. Aircrew 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 are approved by the OG/CC.

3.4.4. Approved checklists contained within AFTTP 3-1.MQ-9, *Tactical Employment MQ-9 (S)*, and AFTTP 3-3.MQ-9 are authorized for use during weapons deliveries.

3.4.5. Setting up a cockpit for another aircrew (also referred to as "running presets") shall be avoided to the maximum extent possible. **(T-3)** Local squadron commanders may authorize qualified aircrew other than the gaining handover aircrew 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. Checklists must be completed by aircrew using challenge and response to maximum extent possible. **(T-3)**

3.4.5.2. Aircrew will advise the operations supervisor a cockpit is being set up for a later aircrew. **(T-3)**

3.4.5.3. Aircrew that will conduct the gaining handover should make every effort to complete all required checklists themselves. **(T-3)**

3.4.5.4. Prior to assuming control of the aircraft, the gaining handover PIC must be aware of the status of both the GCS and the aircraft. **(T-3)**

3.5. Ground Operations. During ground operations with the aircraft powered, the PIC 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. **(T-3)**

3.6. Engine Start/Taxi.

3.6.1. Engine Start.

3.6.1.1. Aircrew must have a fireguard for all engine starts. **(T-3)**

3.6.1.2. The engine will only be started on the command of the PIC. **(T-3)**

3.6.2. Taxi Operations (including SATCOM taxi operations).

3.6.2.1. Guidance on taxi distances and restrictions is provided in AFMAN 11-218, *Aircraft Operations and Movement on the Ground*. Aircrew will not taxi an aircraft within 25 feet of obstructions without wing walkers. **(T-3)**

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

3.6.2.1.2. When taxiing in an area requiring a marshaller IAW AFMAN 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 PIC 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. **(T-3)**

3.6.2.2. If the PIC loses sight of the taxiway centerline, the PIC will stop the aircraft until visual contact with the centerline is reacquired. **(T-3)** If the PIC cannot regain sight of the centerline, a marshaller will be used before moving the aircraft any further. **(T-3)**

3.6.2.3. The SO uses the MTS to ensure the aircraft is clear of obstructions during taxi operations. The SO obtains clearance from the PIC prior to releasing the MTS from position mode.

3.6.2.4. When using only the MTS to taxi, the PIC will completely stop the aircraft before releasing the MTS from position mode. **(T-2)** The PIC will place the MTS in position mode prior to resuming taxi. **(T-3)**

3.6.2.5. Maintain safe taxi speeds at all times not to exceed 10 knots ground speed (KGS) on a taxiway, 20 KGS on a runway, and less than 6 KGS in turns 30 degrees or greater. Maintain Technical Order (TO) taxi limits at high gross weight, with asymmetrical weapons load, on uneven surfaces, over obstacles, and other abnormal situations.

3.6.2.6. Minimum taxi interval between MQ-9 aircraft is 150 feet daytime, 300 feet at night. **(T-3)** Pilots exercise caution and increase following distance when taxiing behind heavy or jet powered aircraft.

3.6.2.7. When runway condition reading is less than Runway Condition Reading (RCR) 12, minimum taxi interval is 300 feet.

3.6.2.8. Prior to unpinning and/or arming ordnance, pilots will confirm with the ground crew that hands and feet are clear of all aircraft controls and parking brake is set. **(T-3)**

3.6.2.9. Pilots will not taxi in front of aircraft being armed or de-armed with forward firing ordnance. **(T-3)**

3.6.2.10. Pilots will not taxi over a raised cable. **(T-3)**

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

3.7.1. Minimum runway length is 5,000 feet. **(T-3)**

3.7.2. Minimum runway width is 75 feet. **(T-3)**

3.7.3. Minimum taxiway width is 50 feet. **(T-3)**

3.7.4. Runway lighting is not required. Departing from an unlit runway requires two operable IR sources at takeoff. **(T-3)**

3.8. Takeoff/Departure.

3.8.1. The pilot flying will accomplish a departure brief to include the current automatic terminal information service (ATIS) or most pertinent weather information, takeoff distance, climb and stall speeds, and applicable emergency procedures, including the ability/plan for an immediate landing after takeoff. When conducting a manual takeoff, the pilot will also brief the associated acceleration check, rotation, and liftoff speeds. **(T-3)**

3.8.2. For takeoff, the SO will select a different head-up display (HUD) video source and camera from the one selected by the pilot. **(T-2)** When conducting an automatic takeoff from a Block 30 GCS, the alternate source may be displayed on the Safety, Tactical, Operation, Reliability, and Maintenance (STORM) console instead of the HUD.

3.8.3. On training missions when not conducting an automatic takeoff, aircrew will not takeoff if the computed takeoff roll exceeds 80 percent of the available runway. **(T-3)** On all other missions, ensure runway length exceeds takeoff distance indicated by takeoff and landing data (TOLD) for configuration flown.

3.8.4. Aircrew may takeoff prior to a raised cable provided there is at least 5,000 feet of runway or minimum required takeoff distance (whichever is greater) prior to the raised cable.

3.8.5. The SO will place the MTS in position mode for takeoff. **(T-3)** Flight graphics will be displayed on both PSO racks until at least 500 feet AGL. **(T-3)**

3.8.6. During departure and arrival, the SO will monitor the flight path and advise the pilot of any deviations from ATC clearance. **(T-3)**

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/In-Mission. The pilot normally will have flight graphics displayed. **(T-3)**

3.9.1. Operations (Ops) Checks.

3.9.1.1. The aircrew will perform Ops checks at least once per hour. **(T-3)** These checks will include fuel level, oil level, electrical, datalink, engine parameters and emergency mission status at a minimum. **(T-3)** Documentation of ops checks is encouraged.

3.9.1.2. Aircrew will conduct ops checks during climb or at level-off after takeoff. **(T-3)**

3.9.2. Emergency Mission Management. Upon return to base (RTB) from working areas that are outside line of sight range (typically 70 nautical miles [NM]), pilots will update the emergency mission by deleting waypoints as they are passed until the emergency mission wholly resides within line of sight range to the LRE. **(T-3)** MCE crews will continue this requirement even if terminating via automatic landing. **(T-3)**

3.9.3. Weather. All MQ-9 elements will check and continue to monitor all weather reporting available throughout all phases of flight. **(T-3)** This includes Meteorological Aviation Report readings (METAR), Terminal Aviation Forecasts (TAF), and Automated Terminal

Information Service (ATIS) for recovery and potential alternate/divert bases in addition to reviewing the Mission Execution Forecast (MEF) for pre-mission planning.

3.10. Approach, Go-Around, and Landing. Aircrew will comply with wake turbulence avoidance criteria for small aircraft. **(T-3)**

3.10.1. Approach (manual and automatic).

3.10.1.1. The PIC will accomplish an approach brief to include the current ATIS information, approach and glide speeds, type of landing, landing distance, go around point and missed approach procedures (as applicable). **(T-3)** Additional items may be briefed per local instructions.

3.10.1.2. The pilot must have visual reference to the ground prior to descending below minimum vectoring altitude or 1,500 feet AGL without a compatible terminal approach procedure at the operating airfield. (**Exception:** For ATLC, see **Attachment 6**) **(T-2)**

3.10.2. Go-Around (manual and automatic).

3.10.2.1. For manual landings, pilots will establish normal glide path by 200 feet AGL. **(T-3)** Aircrew will initiate a go-around if a stabilized descent rate exceeds 1,200 feet per minute below 200 feet AGL, a stabilized descent rate exceeds 800 feet per minute below 50 feet AGL, airspeed stabilizes more than 5 knots indicated airspeed (KIAS) below calculated approach speed, or a pilot-induced oscillation or bounce. **(T-3)**

3.10.2.2. The SO monitors the approach (both automatic and manual) and announces over intercom any deviations exceeding these parameters and call a go-around. Once go-around is initiated, the sensor operator must confirm the throttle position and pitch command by visually checking the pilot's control inputs are set for a positive rate of climb. **(T-3)** Verify and verbalize the laser or radar altimeter (as applicable) and vertical velocity indicator are both increasing. **(T-3)**

3.10.2.3. Unless otherwise briefed, the SO announces altitude deviations exceeding +/-100 feet at the initial approach fix (IAF), final approach fix (FAF), and minimum descent altitude (MDA), as well as when reaching decision height (DH) or the missed approach point (MAP).

3.10.3. Landing (manual or automatic).

3.10.3.1. Aircrew will not attempt landing or touch-and-goes over raised webbing-type barriers (e.g., MA-1A, 61QS1**1)** **(T-3)** 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.

3.10.3.2. For landing, the SO will select a different HUD video source and camera from the one selected by the pilot. **(T-3)** When conducting an automatic landing from a Block 30 GCS, the alternate source may be displayed on the STORM console instead of the HUD. **(T-3)**

3.10.3.3. Aircrew will place the MTS in position mode and flight graphics displayed on both PSO racks prior to descending below 500 feet AGL. **(T-3)**

3.10.3.4. Accomplish the before landing checklist prior to departing the perch, departing the final approach fix, 3 NM final on a straight-in/visual approach, or departing low key.

3.10.3.5. If the MTS is the only available video source for landing, the SO will not conduct a non-uniformity correction of the MTS on final approach without prior coordination with the PIC. **(T-3)** If the MTS is not suitable for landing below 1,500 feet AGL on final approach, and no other video sources are available, initiate a go around.

3.10.3.6. Pilots will not practice night electro-optical nose-camera landings. **(T-3)** Pilots may practice night electro-optical nose camera low approaches.

3.10.3.7. When conducting a manual landing and the computed landing roll exceeds 80 percent of the available runway, land at an alternate, if possible. **(T-3)**

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 400 lbs (500 lbs for aircraft carrying one or more ER tank), whichever is higher.

3.11.1.1. Joker Fuel. A pre-briefed fuel state to terminate an event and proceed with the remainder of the mission. Monitor joker fuel for each mission event and/or stage of flight and adjust execution as required to remain within planned fuel states throughout the mission.

3.11.1.2. Bingo Fuel. A pre-briefed fuel state that allows the aircraft to return to the base of intended landing using preplanned recovery parameters and arrive with normal recovery fuel. Aircrew will not purposely overfly bingo fuel. **(T-3)**

3.11.1.3. Point of No Return: When only LOS L/R operations are available, the PIC will determine a point of no return along the route of flight that is the last possible diversion point to LOS LRE within fuel available. **(T-2)** This point will inform pre-launch risk decisions, and in-mission weather divert decisions based upon real-time changes in weather at the intended destination.

3.11.2. Minimum Fuel. Pilots declare minimum fuel to the controlling agency as soon as it becomes apparent that the aircraft enters initial or starts an instrument final approach at the base of intended landing, or alternate if required, with 350 lbs of fuel or less.

3.11.3. Emergency Fuel. Pilots declare emergency fuel to the controlling agency as soon as it becomes apparent that the aircraft will enter initial or start an instrument final approach at the base of intended landing, or alternate if required, with 300 lbs of fuel (measured from the header tank) 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 +15 KIAS or IAW TO guidance for software branches with stall speeds that account for flap position.

3.12.3.2. Initial torque setting to establish the SFO is per AFTTP 3-3.MQ-9 for configuration flown. After the aircraft is established in the glide, adjust torque per AFTTP

3-3.MQ-9 based upon flight conditions and performance to avoid chasing the torque, potentially resulting in a low torque condition.

3.12.3.3. Aircrew will terminate the maneuver if not in a position to land by base key or one mile final (straight-in approach). **(T-2)** Aircrew shall make an intra-cockpit 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. **(T-2)**

3.12.3.4. Touchdown from an SFO is prohibited. Aircrew will initiate go-arounds from SFO patterns in sufficient time to prevent touchdown. **(T-2)**

3.12.4. Because instructors and/or flight examiners do not have immediate access to a set of controls, the PIC ensures all in-flight practice of emergency procedures are thoroughly briefed, prior to initiation. Instructors and/or flight examiners will direct the aircrew on expected actions (verbalized, simulated, or actual procedures) prior to in-flight practice or simulation of emergency procedures. **(T-3)**

3.13. Unexpended Ordnance. Pattern work, to include touch-and-go options, are authorized with unexpended live and or inert free-fall and or forward-firing munitions. Further local restrictions may apply, see also **paragraph 8.4**.

3.14. De-Arm Procedures. All aircraft with live or inert ordnance on board will go through de-arm prior to taxi back. **(T-3)** Pilots will confirm all switches are safe, hands are clear, and parking brake set prior to de-arm crew approaching the aircraft. **(T-3)**

3.15. Functional Check Flight. There is no functional check flight requirement.

3.16. Air Force Technical Order (AFTO) Form 781. Prior to assuming control of the aircraft, the PIC must be aware of the status of the entire system, both aircraft and GCS. **(T-3)** Unit procedures will ensure:

3.16.1. AFTO Form 781 A, *Maintenance Discrepancy and Work;* AFTO Form 781 H, *Aerospace Vehicle Flight Status and Maintenance*; AFTO Form 781 K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Discrepancy Document* remains with the PIC to the maximum extent possible while the aircraft is in flight. **(T-3)** When not with the PIC, the AFTO Forms 781 A/H/K must be maintained with a member of operations supervision throughout the flight. **(T-3)**

3.16.2. LRE PIC. IAW DAFI 21-101, *Aircraft and Equipment Maintenance Management,* the LRE PIC will review applicable aircraft and Launch/Recovery GCS AFTO Form 781 series forms prior to launch and relay pertinent configuration data, open aircraft write-ups, and required in-flight Ops checks to the mission control element (MCE) PIC **(T-2)** The LRE PIC will enter any aircraft discrepancies into the aircraft AFTO Form 781 that are relayed by the MCE PIC. **(T-2)** LRE PIC retains responsibility for this requirement when the aircraft is launched via SATCOM L/R. **(T-2)**

3.16.3. MCE PIC. IAW DAFI 21-101, the MCE PIC will review applicable aircraft AFTO Form 781A information (provided electronically), and GCS AFTO Form 781 series forms information (provided electronically) prior to handover from the LRE (as applicable). **(T-2)** MCE PIC will annotate all aircraft discrepancies in the electronic maintenance log or pass to the LRE PIC for entry into the aircraft forms if an electronic maintenance log is not used or

available. **(T-2)** MCE PIC will document GCS discrepancies on GCS AFTO Form 781A. **(T-2)**

3.16.4. MCE to MCE Changeover. MCE PICs will review applicable aircraft AFTO Form 781A information (provided electronically) and GCS AFTO Form 781 series forms information (provided electronically) prior to changeover **(T-2)** During the changeover briefing, the outgoing MCE PIC will ensure the incoming MCE aircrew is briefed on any updates to aircraft and GCS status to include discrepancies that have been annotated in electronic maintenance log or passed to the LRE PIC for entry into the aircraft forms if electronic maintenance log is not used or available. **(T-2)**

3.16.5. Maintenance coordination. Upon making an entry into AFTO Form 781 or electronic maintenance log entries, PICs will notify maintenance personnel of the entry as soon as practical and will be available for debrief upon aircrew changeover and/or landing. **(T-3)**

3.17. Above Maximum Allowable Gross Weight (MAGW) Operations. Above MAGW operations require a waiver IAW **paragraph 1.2**..

3.17.1. Aircrew will evaluate the following considerations when conducting above-MAGW operations:

3.17.1.1. Pilot training, proficiency, and currency. **(T-3)**

3.17.1.2. Environmental conditions. **(T-3)**

3.17.1.3. Maximum descent rate at touchdown figure in the TO 1Q-9(M)A-1, *Flight Manual USAF Series MQ-9A Aircraft* (flight manual). **(T-3)** In the absence of flight manual data, PIC shall not accomplish landings above 10,500 lbs gross weight unless emergency conditions exist. **(T-3)**

3.17.2. Training. Any waiver for above MAGW operations should include guidelines to conduct takeoffs and low approaches to meet training requirements. Aircrew will not practice landings above flight manual maximum allowable landing weight, to include touch and go landings. **(T-2)**

3.17.3. Heavyweight Landing Assessment. The primary risk associated with above MAGW operations is the increased probability of airframe damage during landing. If circumstances (such as weather, aircraft malfunction, etc.) require a landing above maximum flight manual landing weight limitations, the aircrew will immediately notify squadron supervision and the supervisor of flying (SOF) and/or FOS (AFSOC). **(T-2)**

3.17.4. Heavyweight Landing Inspection Criteria. Aircrew will document every landing above maximum allowable landing weight in the AFTO Form 781 (include landing weight and sink rate). **(T-2)** Aircraft with applicable software, and configured with a laser altimeter, are exempt from the requirements of this paragraph.

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

3.18.1. The OG/CC is the approval authority for interfly on aircraft under their control.

3.18.2. In all cases, interfly aircrew will be qualified in the mission design series. **(T-2)**

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

3.19.1. Terrain Clearance Requirements. During all low-altitude flight, aircrew will ensure the aircraft remains a minimum of 1 NM away from any factor terrain. **(T-3)** 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.

3.19.2. Mission Preparation.

3.19.2.1. Briefing requirements. During briefings, emphasis is on low-altitude flight maneuvering, effects of task saturation, time to ground impact, emergency landing sites, divert locations, terrain features and/or obstacles along the route of flight, TO emergency mission flight profile and associated planning considerations, and emergency mission start point placement requirements for terrain clearance.

3.19.2.1.1. Low-level abort procedures. Compute and brief low-level abort altitude(s). Compute the abort altitude for the entire route and area using minimum safe altitude (MSA). MSA provides a clearance of 1,000 feet (2,000 feet in mountainous terrain) above the highest obstacle or terrain feature (rounded to the next highest 100 feet) within 5 NM of the planned course, route boundaries, or operating area (e.g., military operations area (MOA), low fly area, restricted area). Operation below MSA is authorized day or night as long as aircrew comply with the terrain clearance requirements of **paragraph 3.19.3.2**.

3.19.2.1.2. Aircrew shall compute an MSA for each segment of the intended route of flight and for separate operating areas. **(T-3)**

3.19.2.1.3. 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 are annotated on the low-altitude chart. Increase the 1 NM clearance requirement, based on the turn radius of the aircraft going lost-link. Aircrew will 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. **(T-3)**

3.19.2.1.3.1. LOWAT navigation. When navigating point-to-point in the low-altitude environment, the basic 1 NM terrain clearance requirement remains unchanged. **(T-3)** However, if operating on a point to point pre-planned route, with a current and updated emergency mission, a lost link scenario does 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. **(T-3)**

3.19.2.1.3.2. LOWAT tactical maneuvering. When tactical maneuvering is 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. **(T-2)**

3.19.2.2. Low-Altitude Maps. On all low-altitude flights, each aircraft needs a minimum of one chart-updating manual (CHUM)-updated map of the low-altitude route or training areas. **(T-2)** The map will be available either digitally or hardcopy during low-altitude flight. **(T-2)**

3.19.2.2.1. The map scale and quality of terrain features, hazards, and chart annotations must have sufficient detail to allow navigation and safe mission accomplishment. **(T-2)**

3.19.2.2.2. Aircrew will annotate all maps with an abort altitude and brief the abort altitude prior to descending below 5,000 feet AGL. **(T-2)**

3.19.3. General Low-Altitude Procedures**.**

3.19.3.1. Weather minimums. Weather minimums for low-level training are 3,000 feet ceiling and 5 statute miles (SM) visibility (as determined by the planned MTS camera source).

3.19.3.2. If unable to maintain positive visual terrain clearance using the available aircraft sensors, the PIC will immediately climb to, or above, the briefed minimum safe altitude. **(T-2)** The PIC will transition to a known flight reference to ensure expected aircraft attitude while climbing to the abort altitude and maneuver the aircraft as necessary while climbing to the abort altitude to ensure terrain clearance. **(T-2)**

3.19.3.3. Minimum flight airspeed during low-altitude operations is stall +15 KIAS or IAW TO guidance for software branches with stall speeds that account for flap position.

3.19.3.4. During all low-altitude operations, in the event of task saturation, diverted attention, or in any other emergency, the PIC will begin a climb to a safe altitude. **(T-2)**

3.19.3.5. The pilot will have a readily-available forward-facing camera source (nose camera [IR nose camera required for night] or MTS position mode) visible at all times for terrain clearance reference. **(T-2)** The forward-facing camera source may be displayed as either the pilot's HUD video source or displayed on the auxiliary monitors via frame grabber or other video display capability.

3.19.3.6. Aircrew will brief and discuss emergency mission management and the emergency mission start point prior to descending into the low-altitude environment. **(T-2)** 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. **(T-2)**

Chapter 4

INSTRUMENT AND WEATHER PROCEDURES

4.1. Approach Category. The MQ-9 is an approach category B (91-120 KIAS per AFMAN 11-202V3) aircraft.

4.2. Weather Minimums, Restrictions, and Planning Factors.

4.2.1. Ceiling and visibility.

4.2.1.1. Operating the aircraft in the terminal environment, below visual flight rules (VFR) minimums, requires an air surveillance monitoring radar for flight monitoring during GPS Landing Systems approach. (**Exception:** For ATLC, see **Attachment 6**). **(T-3)** The MQ-9 INS/GPS are not certified for flying GPS instrument approaches.

4.2.1.2. Alternate airfield weather criteria are defined in AFMAN 11-202V3. For the purpose of weather/alternate requirements, MQ-9 operating locations are considered isolated destinations when not located within 2 hours from another LRE, and are authorized holding in lieu of filing an alternate per AFMAN 11-202V3. (**Exception:** For ATLC, see **Attachment 6**). When an alternate airfield is not an option or not available, aircrew comply with the following ceiling and visibility restrictions:

4.2.1.2.1. Takeoff weather and forecasted landing weather +/- 1 hour (excluding temporary [TEMPO] groups) must be at, or greater than 800 feet and 2 SM, or 500 feet and 1 SM greater than the lowest compatible approach minimum (whichever is greater). **(T-2)** OG/CC may waive visibility minimums due to sand/dust only. (**Exception:** For ATLC, see **Attachment 6**)

4.2.1.2.2. Once airborne, if destination forecasts change and the aircrew is unable to adjust landing time (early or late) to meet requirements in **paragraph 4.2.1.2.1**, aircrew will increase recovery fuel to allow four hours of holding over the destination at maximum endurance speed, at expected holding altitude, at calculated destination gross weight, and engine speed set to minimum, then expect to penetrate and land with normal recovery fuel. **(T-2)** (**Exception:** For ATLC, see **Attachment 6**)

4.2.1.2.3. When actual or forecasted ceiling is below 3,000 feet and/or the visibility is less than 3 SM, aircrew will increase recovery fuel to allow holding for two hours over the destination at maximum endurance speed, at expected holding altitude, at calculated destination gross weight, and engine speed set to minimum, then expect to penetrate and land with normal recovery fuel. **(T-2)** This requirement does not apply if visibility is below minimums due to sand and/or dust, and flying with an operable nose IR or MTS IR camera.

4.2.2. Turbulence. Aircrew will not takeoff if severe turbulence is reported or forecast along the planned route of flight for clear air turbulence type III aircraft (as defined in Air Force Handbook (AFH) 11-203 Volume 2, *Weather for Aircrews—Products and Services*). **(T-3)** (**Exception:** For ATLC, see **Attachment 6**).

4.2.3. Wind.

4.2.3.1. Aircrews will not takeoff or land unless actual winds are within flight manual limits during takeoff or landing. **(T-3)**

4.2.3.2. Prior to takeoff, aircrew must ensure forecast (prevailing, FM groups, PROB groups, and the end time of BECMG groups, but not TEMPO groups) steady state winds are within flight manual limits at recovery airfield estimated time of arrival (ETA) (±1 hour) and will adjust ETA (early or late) when necessary to meet this requirement. **(T-2)**

4.2.3.2.1. If revised forecast steady state winds at ETA (±1 hour) exceed flight manual limits, the PIC will, if fuel state and/or mission parameters allow, adjust ETA to either: overfly the forecast winds out of limits period by at least one hour or terminate the mission to arrive at airfield of intended landing one hour before that forecast period. **(T-2)**

4.2.3.2.2. 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, variability, and/or TEMPO groups exceed flight manual limits, aircrew may execute a takeoff or continue flying, but aircrew will adjust fuel reserves to fly to recovery airfield 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. **(T-2)**

4.2.4. Emergency mission planning. Pilots maintain awareness of current and forecast weather along the planned route of flight, the emergency mission route of flight, and the destination and alternate fields by all available means. Pilots will update the emergency mission route to account for weather hazards, threats, terrain, and restricted airspace along the proposed route of flight. **(T-2)** Pilots will alter the route if necessary using care to select appropriate aircraft parameters to avoid hazardous weather conditions while complying with ATC clearances. **(T-2)**

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. **(T-1)** Whenever the outside air temperature is less than 40 degrees Fahrenheit or 5 degrees Celsius, or the pilot is concerned about frost, ice, or snow, the PIC shall apply an ice retardant to all lift generating surfaces of the wings or inspect the aircraft for frost immediately prior to takeoff. **(T-3)** 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.

4.3.2. Pilots should not conduct flight into forecast moderate or worse icing. Pilots will minimize conduct of flight into known icing conditions to the maximum extent possible. **(T-3)**

4.3.3. Thunderstorms. OG/CCs may authorize operations within 25 NM of thunderstorms when necessary to meet operational requirements. Aircrew will maintain TO directed 25 NM distance unless specifically approved otherwise.

4.4. Runway/Taxiway Conditions.

4.4.1. Units will specify minimum RCR value for taxi operations. **(T-2)** Aircrew will not takeoff or land with an RCR less than 12. **(T-3)** When no RCR is available, refer to

International Civil Aviation Organization (ICAO) conversions in the *DoD Flight Information Publication (enroute) Flight Information Handbook* (FIH).

4.4.2. Handling characteristics of the MQ-9 on ice or snow are sub-optimal. On ice and/or snow, minimize throttle setting to that required to move (or sustain movement of) the aircraft and limit taxi speed to no more than 4 KGS. If required to stop, plan to stop over clear portions of the taxiway, if able. Pilots will avoid using reverse thrust in areas of loose snow, ice and sand. **(T-3)**

Chapter 5

AIR-TO-AIR OPERATIONS

5.1. References. AFI 11-214 contains air-to-air procedures applicable to all aircraft. This chapter specifies additional procedures or restrictions which are applicable to MQ-9 operations.

5.2. Coordination. Aircrew shall conduct a coordination brief between all involved players which includes the following: operating area deconfliction, emergency mission explanation and deconfliction, and AFI 11-214 air-to-air training rules. **(T-3)**

5.3. Maneuvering Limitations. Minimum airspeed during maneuvering is stall +15 KIAS or IAW TO guidance for software branches with stall speeds that account for flap position.

Chapter 6

AIR-TO-SURFACE OPERATIONS

6.1. References. AFI 11-214 contains air-to-surface procedures applicable to all aircraft. Also reference AFMAN 13-212 Volume 1, *Range Planning and Operations,* applicable range supplement and AFMAN 24-604, *Preparing Hazardous Materials for Military Air Shipments.* This chapter specifies procedures or restrictions applicable to MQ-9 operations. On operational test and evaluation sorties, specific portions of this chapter may be waived by instructions contained in the operations order, test plan, or implementation message which authorizes the test.

6.2. Target Identification. Aircrew must positively identify the target prior to weapons release. **(T-1)** For wartime or contingency sorties, aircrew will comply with special instructions (SPINS) and theater rules of engagement (ROE). **(T-1)** For training sorties, aircrew will achieve positive identification either visually or by confirming target location through valid on-board or off-board cues. **(T-3)** Examples of available means include, but are not limited to: marking rounds, IR pointers, synthetic aperture radar, MTS, map plots, data links, radio communications, talk-ons with joint terminal attack controllers (JTAC), Range Control Officer (RCO), participating aircrew, etc.

6.3. Live/Heavyweight Ordnance Procedures. The pilot will verify they have an appropriate airspeed to allow full roll authority when employing weapons during gross heavyweight conditions to allow for tactical maneuvering from release through the egress maneuver. **(T-3)**

6.4. Instrument Meteorological Conditions (IMC) Weapons Deliveries. Pilots may release live or inert weapons in or through IMC IAW the following procedures, unless restricted by range procedures or theater ROE (verification requirements against known target coordinates only apply to training sorties):

6.4.1. Ballistic ordnance releases. Aircrew will verify stores management system (SMS) target coordinates against known target coordinates prior to release. **(T-2)**

6.4.2. Inertially aided munitions. Aircrew will verify SMS target coordinates against known target coordinates prior to release. **(T-2)**

6.5. Battle Damage/Weapons Checks. Aircrew will perform a battle damage/weapons check of weapons stations prior to or during RTB. **(T-2)** Additionally, aircrew will perform this check following expenditure of live ordnance. **(T-2)** If unable to complete check using organic sensors, aircrew will ensure de-arm aircrew checks aircraft before taxiing to populated areas. **(T-2)**

6.6. Simulated Attacks Against Off-Range or Manned Targets. A simulated attack is defined as an attack in which the pilot presses the launch enable button/pulls the trigger with the intention of conducting a dry pass. Simulated attacks may be conducted under the following restrictions:

6.6.1. During peacetime operations or operations in the Continental United States (CONUS), simulated attacks against off-range or manned targets with live weapons is prohibited per AFI 11-214. **(T-2)**

6.6.2. For wartime or contingency sorties, comply with theater SPINS and ROE. If no theater SPINS and/or ROE exists, aircrew will apply the following training rules. **(T-2)**

6.6.2.1. Air-to-Ground Missile (AGM)-114: When carrying live AGM-114 Hellfires aircrew may accomplish AGM-114 Hellfire training against targets (on and off-range with

both manned and unmanned targets) by maneuvering to a specific location using R-Missile Impact Tool information and verbalizing release while remaining two switch positions from launch (Master Arm SAFE and Trigger). **(T-2)**

6.6.2.2. Guided Bomb Unit (GBU): When carrying live and/or inert GBU, aircrew will not conduct simulated GBU attacks against manned targets and off-range targets. **(T-2)**

6.6.2.3. Mixed Load: When carrying either live or inert ordnance (regardless of type) and training ordnance (software-generated trainer munitions) aircrew may accomplish training with AGM-114s, provided no live AGM-114s remain, while remaining two switch positions from launch (Master Arm in SAFE and Trigger). **(T-2)**

6.7. Procedures for carrying live, inert, and captive carry Guided Bomb Unit (GBU) ordnance. Procedures for carrying live or inert GBU-12 ordnance in conjunction with cocked linear electro-mechanical actuator (LEMA) for bomb rack unit (BRU)-15 or closed hooks for BRU-71 on empty weapons stations. **Warning:** There is no overt indication on the pilot HUD or SMS screens that differentiate between live or inert GBU-12 and cocked LEMAs (BRU-15) or closed hooks (BRU-71). To prevent inadvertent selection and release of live or inert ordnance, aircrew will adhere to the following procedures. **(T-1)**

6.7.1. If live or inert GBU ordnance is being carried in conjunction with a cocked LEMA or closed hooks on any empty station, aircrew will ensure live or inert GBUs are loaded on station 5 first followed by station 3 then station 6 and finally station 4 if additional GBUs are required. **(T-1)**

6.7.2. Aircrew will not activate the cocked LEMA/closed hook station(s) ("fire") or other training munitions until all live or inert ordnance has been visually confirmed released with the MTS. **(T-1)**

6.7.3. Aircrew will conduct dry attacks with the cocked LEMA/closed hooks selected while releasable freefall munitions are on the aircraft. **(T-1)** Aircrew will not select the live or inert GBU until ready to release the live or inert ordnance. **(T-1)**

6.8. Master Arm Switch. When carrying releasable ordnance, configure IAW AFI 11-214 and **paragraph 6.6**.

6.8.1. For multiple weapons release passes, master arm switch may remain "Armed" unless 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, aircrew will "safe" the master arm switch between passes. **(T-1)**

6.8.2. The use of master arm and release switches is authorized when not carrying releasable ordnance. When carrying releasable ordnance, aircrew will remain two switch positions away from release at all times prior to intentionally releasing live or inert ordnance. **(T-1)** The two deselected switches are the master arm switch and the trigger.

6.9. Training Laser Operations. When conducting simulated attacks utilizing the Training Laser, positively identify the presence of Training Laser indicators prior to each activation of the laser. Additionally, while engaged in simulated attacks, continuously monitor the laser range designator (LRD)/Training Laser status to ensure the system does not inadvertently switch from a training to "LRD" mode due to momentary link hit. If a link hit is noticed while in either LRD or

Training Laser activation, the aircrew will safe the laser and revert to the normal LRD/Training Laser setting. **(T-2)**

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. **(T-2)**

7.1.2. Launching aircrew will not take off with any known malfunction unless the gaining MCE states the malfunction is acceptable and will not adversely affect their mission. **(T-3)**

7.2. Ground Emergencies.

7.2.1. Pilots will not taxi with nose-wheel steering, brake system, video path, telemetry, or datalink malfunctions. **(T-1)**

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. **(T-1)**

7.3. In-flight Emergencies.

7.3.1. Air Aborts. Aircrew will abort the mission, regardless of apparent damage or subsequent normal operation, if any of the following occur: bird strike, over-G, over-speed, flight control system anomalies (including uncommanded flight control inputs), or engine failure. **(T-1)**

7.3.2. Landing Gear Malfunctions. If aircrew encounter a landing gear malfunction and the gear are down, leave them down and do not make touch and go landings. **(T-1)**

7.3.3. Hard Landing. If the Caution "Airframe – Hard Landing – Inspection Required" appears, or a hard landing or over-G is suspected or confirmed, pilots will stop the aircraft straight ahead and perform a visual aircraft scan. **(T-2)** Be aware that there can be damage to the aircraft that cannot be viewed by the MTS. Unless operational factors dictate otherwise, aircrew will notify maintenance for a tow in order to prevent additional damage to the aircraft. **(T-2)**

7.4. Armament System Malfunctions.

7.4.1. Inadvertent Release. Aircrew will record switch positions at the time of inadvertent release and provide information to armament and safety personnel. **(T-1)** Aircrew will safe all switches when operational constraints permit and record the impact point, if known. **(T-1)** If equipment failure is suspected, aircrew will not attempt further release in any mode. **(T-1)** For suspected equipment failures, follow hung ordnance procedures and RTB. **(T-1)**

7.4.2. Failure to Release/Hung Ordnance. If ordnance fails to release when all appropriate switches are set, aircrew will note position of all release and fusing switches, and when

operational constraints permit, set them to safe. **(T-1)** Refer to TO 1Q-9(M)A-34-1-1, *Nonnuclear Munitions Delivery Manual, USAF Series MQ-9 Reaper*, as applicable.

Chapter 8

LOCAL PROCEDURES

8.1. General. This chapter is for unit-specific local operating procedures. Procedures herein are not less restrictive than those contained elsewhere in this regulation, nor is this chapter 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 and distribution of supplements. Individual squadron local operating procedures are required for all units, however only one Local **Chapter 8** is required if more than one squadron is co-located at the same installation, and is approved by the OG/CC. **(T-2)**

8.2. Format. Organize and number the local **Chapter 8** in the following format to include, but not limited to, the following paragraphs outlined in **Figure 8.1**.

Figure 8.1. Local Chapter 8.

Paragraphs:	**Guidance should include local procedures for the following, if applicable:**
8.1 Introduction 8.2 General Guidance 8.3 Mission Planning 8.4 Ground Operations 8.5 Flying Operations 8.6 Local Airspace Procedures 8.7 Weapons Employment 8.8 Abnormal Procedures Attachments (Illustrations)	Local Area Procedures. ATC procedures. Traffic pattern and airfield procedures. Local gunnery and range procedures/restrictions. Controlled Emergency Landing Areas/Procedures. Hung Ordnance/Weapons Malfunction Recovery. Local Weather Procedures. Approved Alternate Missions. Unit Standards. Initial Lost Link Altitude. Frequency Deconfliction Unexpended Ordnance Divert Planning

8.3. Frequency Deconfliction. Local **Chapter 8** will contain procedures to ensure deconfliction of uplink/downlink control frequencies. Procedures will ensure positive control methods via the Operations Supervisor, Mission Commander, SOF or other local equivalent. **(T-2)** Additionally, local procedures will ensure positive deconfliction of aircraft on start-up from aircraft in critical phases of flight within 20 Megahertz (MHz) of a default frequency. **(T-2)** Local **Chapter 8** will include clear instructions on how frequencies are named, paired, and polled. **(T-2)** When possible, uplink/downlink frequencies should be paired into quad pools with one name. Guidance should be descriptive and understandable for all MQ-9 units (LRE and MCE).

8.4. Local Traffic Pattern and Unexpended Ordnance. Local OG/CCs (or equivalent) balance the mission and training priorities versus inherent danger of touch-n-goes with live ordnance to aircraft and populated areas. The Local **Chapter 8** may include more restrictive guidance than

paragraph 3.13 if local commanders deem touch-and-go landings and pattern work poses unacceptable risk.

8.5. Divert Planning. Local **Chapter 8** will include guidance for planned and emergency divert options with the various landing methods available. **(T-2)** Guidance will also include guidance for Ku forced landing at other than planned divert locations (e.g., - ditch if outside of divert ranges). **(T-2)**

Chapter 9

DOMESTIC USE OF UNMANNED AIRCRAFT SYSTEMS IN UNITED STATES (U.S.) NATIONAL AIRSPACE

9.1. General. This chapter provides guidance for the domestic use of the United States Air Force (USAF) MQ-9 in U.S. National Airspace (hereafter "domestic use" or "domestic operations") to ensure that such use is IAW U.S. law and Department of Defense (DoD) policy. This guidance applies to all domestic use of USAF MQ-9 procured or purchased using USAF funds, or operated by Regular Air Force, Air Force Reserve, or ANG personnel (in a United States Code (USC) Title 10, Title 32, or State active duty status), or under contract to the USAF.

9.2. Privacy and Civil Liberties Requirements. In order to ensure accountability and promote transparency in the protection of privacy, and to ensure conformance with law, regulations, and guidance related to privacy and civil liberties, all USAF MQ-9 units will report all domestic MQ-9 operations (excluding training, exercises, repositioning, research, development, testing, and evaluation), via Memorandum for ACC/A3M on an annual basis, due 1 October. **(T-2)** Units will include a brief description of the types or categories of missions flown; summaries of sensors employed; any information acquired, and whether any information was collected, retained, or disseminated; and the number of times assistance was provided to other Federal departments and agencies, or to State, local, tribal, or territorial governments, and under what authority such assistance was provided. **(T-2)** An example report format is found in **Attachment 4**.

9.3. Domestic Operations. Domestic use of MQ-9 by the Air Force will be conducted IAW the Federal Aviation Administration (FAA) policies, regulations, and memoranda of agreement concerning the operation of Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS), and consistent with applicable laws. **(T-0)**

9.3.1. Flight operations shall only be conducted outside of restricted airspace and warning areas with a FAA authorization in the form of a FAA Certificate of Waiver or Authorization, or notification IAW FAA/DoD guidance or agreements. **(T-0)**

9.3.2. Domestic MQ-9 operations from joint base installations require joint base commander approval, which may be delegated in writing to the O-6 level commander responsible for flying operations. **(T-1)**

9.3.3. Units requiring NAS access outside of restricted or warning areas (including transit requirements to get to those areas) must consult with the respective lead MAJCOM before beginning the FAA Certificate of Waiver or Authorization (COA) application and to request access to the FAA on-line application web site. **(T-1)** Air Combat Command Airspace Operations Branch (ACC/A3AA), is the primary POC for COA and airspace access authorization issues. DAFMAN 13-201 ACCSUP, *Airspace Management*, contains guidance on the COA application process. AFSOC and the Air Force Research Laboratory (AFRL) will process COAs for their subordinate units. **(T-1)**

9.3.4. All MQ-9 domestic operations will comply with all law, regulations and guidance related to privacy and civil liberties. **(T-0)** For this reason, Air Force components should collect domestic imagery only when there is a justifiable need to do so. Exercises, training, testing or navigational purposes are generally valid reasons to acquire domestic imagery.

9.3.4.1. Regardless of the purpose of acquisition or collection of domestic imagery, nonconsensual surveillance on specifically identified U.S. persons is prohibited, and information may not be acquired or collected for the purpose of obtaining information to gather any specific information about a U.S. person or private entity or private property without consent, unless expressly approved by the Secretary of Defense (SecDef) or delegated authority listed in **Attachment 5**, consistent with U.S. law and regulations. **(T-0)** Acquired or collected imagery may incidentally include U.S. persons or private property without consent. Any stored imagery will not be retrievable by reference to U.S. person identifiers. **(T-0)**

9.3.4.2. Any imagery collected by the MQ-9 intended for public release must be cleared for release through local public affairs release authority IAW AFI 35-101, *Public Affairs Operations*; Chapter 7, Visual Information and Chapter 9, Security and Policy Review Process. **(T-1)** Prior to public affairs review for release, the selected imagery must be reviewed by the flying and exploitation units IAW applicable current weapon system classification guides. **(T-1)**

9.3.5. All MQ-9 operations will be IAW DoD component intelligence oversight (IO) guidance and USAF regulations and policy within AFPD 14-4. **(T-0)** Additionally, MQ-9 domestic operations will require a proper use memorandum IAW AFI 14-404, *Intelligence Oversight*. **(T-1)** Unit commander (or equivalent) will ensure there is a MAJCOM/A2 (or equivalent) approved proper use memorandum on file prior to MQ-9 domestic operations. **(T-1)** For Counter Intelligence/Foreign Intelligence (CI/FI) and intelligence-related activities, reference AFI 14-404 for additional guidance on collecting domestic imagery.

9.3.6. All questionable intelligence activities (QIA) or sensitive/highly sensitive matters (S/HSM) will be reported IAW AFI 14-404 and AFPD 14-4. **(T-0)**

9.3.7. Any proposed domestic use of MQ-9 not specifically delineated in **Attachment 5** requires SecDef approval. **(T-0)** For domestic use requiring SecDef approval, the Under Secretary of Defense for Policy, in coordination with the Chairman of the Joint Chiefs of Staff (CJCS), the appropriate Combatant Command Commander or Commanders, the Under Secretary of Defense for Intelligence and Security (DoD/ (USDI&S)), and the Department of Defense General Counsel (DoD/OGC) will provide a recommendation to the SecDef concerning the domestic use of USAF MQ-9. **(T-0)** The Air Force will submit appropriate requests to the Assistant Secretary of Defense for Homeland Defense and Global Security (ASD (HD&GS)) at least 30 days prior to projected use. **(T-0)**

9.3.7.1. The Secretary of the Air Force may seek verbal approval by the SecDef for domestic use of USAF MQ-9 in urgent, time-critical situations to protect life or property not addressed in **Attachment 5** by contacting ASD (HD&GS).

9.3.7.2. Funding of Approved Domestic Use: Domestic use of MQ-9 in support of civil authorities will be provided on a reimbursable basis unless otherwise required by law, or on a non-reimbursable basis if such support is both authorized by law and approved by the SecDef. **(T-0)**

9.3.7.3. For purposes of **Attachment 5**, installation commander is the commander responsible for flight operations, not further delegable less than an O-6 level commander

responsible for flight operations. **(T-1)** At Joint Bases, the Joint Base Commander is the approval authority. **(T-1)**

JAMES C. SLIFE, Lt Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

10 USC, *Armed Forces*

10 USC §§271-284, *Military Support for Civilian Law Enforcement Agencies*,

18 USC § 1385 (1048), *Use of Army, Navy, Marine Corps Air Force, and Space Force as posse comitatus)*

AFH 11-203 Volume 2, *Weather for Aircrews—Products and Services*, 13 August 2015

AFI 11-214, *Air Operations Rules and Procedures*, 8 July 2020

AFI 14-404, *Intelligence Oversight*, 3 September 2019

AFI 33-322, *Records Management and Information Governance Program*, 28 July 2021

AFI 35-101, *Public Affairs Operations*, 20 November 2020

AFMAN 11-202 Volume 3, *Flight Operations*, 10 January 2020

AFMAN 11-218, *Aircraft Operations and Movement on the Ground*, 5 April 2019

AFMAN 11-230, *Instrument Procedures*, 24 July 2019

AFMAN 11-2MQ-9 Volume 1, *MQ-9—Aircrew Training*, 12 January 2023

AFMAN 11-2MQ-9, Volume 2, *MQ-9—Aircrew Evaluation Criteria*, 12 January 2023

AFMAN 13-212 Volume 1, *Range Planning and Operations*, 22 June 2018

AFMAN 24-604, *Preparing Hazardous Materials for Military Air Shipments*, 9 October 2020

AFPD 11-2, *Aircrew Operations*, 31 January 2019

AFPD 11-4, *Aviation Service*, 12 April 2019

AFPD 14-4, *Management of the Air Force Intelligence, Surveillance, Reconnaissance and Cyber Effects Operations Enterprise*, 11 July 2019

AFTTP 3-1.MQ-9, *Tactical Employment MQ-9 (S)*, 9 April 2021

AFTTP 3-3.MQ-9, *Combat Aircraft Fundamentals MQ-9*, 9 April 2021

CJCSI 3710.01B, DoD Counterdrug Support, 26 January 2007

DAFI 21-101, *Aircraft and Equipment Maintenance Management*, 16 January 2020

DAFMAN 11-401, *Aviation Management*, 27 October 2021

DAFMAN 13-201, *Airspace Management*, 10 December 2020

DAFMAN 13-201 ACCSUP, *Airspace Management*, 19 October 2021

DAFMAN 90-161, *Publishing Process and Procedures*, 15 April 2022

NGA Publication, *DoD Flight Information Publication (enroute) Flight Information Handbook*, published biannually.

DoDD 3025.18, *Defense Support of Civil Authorities (DSCA)*, 29 December 2010

DoDD 5148.11, *Assistant to the Secretary of Defense for Intelligence Oversight*, 24 April 2013

DoDI 3003.01, *DoD Support to Civil Search and Rescue (SAR)*, 26 September 2011

DoDI 3025.21, *Defense Support of Civilian Law Enforcement Agencies*, 27 February 2013

DoDI 3200.18, *Management and Operation of the Major Range and Test Facility Base (MRTFB)*, 1 February 2010

DoDI 5505.17, *Collection, Maintenance, Use, and Dissemination of Personally Identifiable Information and Law Enforcement Information by DoD Law Enforcement Activities*, 19 December 2012

EO 12333, *United States Intelligence Activities*, 4 December 1981

General Atomics ER Engine-out Landing Distance Analysis

TO 1Q-9(M)A-1, *Flight Manual USAF Series 2400 Software and Above MQ-9A Aircraft*, 19 August 2021

TO 1Q-9(M)A-34-1-1, *Nonnuclear Munitions Delivery Manual USAF Series 2400 Software and Above MQ-9A Aircraft*, 29 October 2020

Adopted Forms

AF Form 8, *Certificate of Aircrew Evaluation*

AF Form 4348, *USAF Aircrew Certification*

AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*

AFTO Form 781A, *Maintenance Discrepancy and Work Document*

AFTO Form 781 H, *Aerospace Vehicle Flight Status and Maintenance*

AFTO Form 781 K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Discrepancy Document*

DAF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ACC—Air Combat Command

AFH—Air Force Handbook

AFI—Air Force instruction

AFMAN—Air Force manual

AFPD—Air Force Policy Directive

AFRCC—Air Force Rescue Coordination Center

AFRL—Air Force Research Laboratory

AFSOC—Air Force Special Operations Command

AFTO—Air Force technical order

AFTTP—Air Force tactics, techniques, and procedures

AGL—Above Ground Level

AGM—Air-To-Ground Missile

AKRCC—Alaska Rescue Coordination Center

ANG—Air National Guard

AOA—Angle Of Attack

AoB—Angle of Bank

ASR—Airport Surveillance Radar

ATC—Air Traffic Control

ATKG—Attack Group

ATKS—Attack Squadron

ATLC—Automatic Takeoff and Landing Capability

ATIS—Automatic Terminal Information Service

AWI—Alcohol Water Injection

BDA—Battle Damage Assessment

BLOS—Beyond Line of Sight

BRU—Bomb Rack Unit

CDE—Collateral Damage Estimate

CHUM—Chart-Updating Manual

CJCS—Chairman of the Joint Chiefs of Staff

CJCSI—Chairman Joint Chiefs of Staff Instruction

CRM—Cockpit/Crew Resource Management

COA—Certificate of Waiver or Authorization

COMAFFOR—Commander, Air Force Forces

Comm—Communication(s)

CONUS—Continental United States

CRC—Control and Reporting Center

DH—Decision Height

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DRU—Direct Reporting Unit

DSCA—Defense Support Of Civil Authorities

EEI—Essential Elements of Information

EO—Executive Order

ER—Extended Range

ETA—Estimated Time of Arrival

FAA—Federal Aviation Administration

FAF—Final Approach Fix

FCIF—Flight Crew Information File

FL—Flight Level

FOA—Field Operating Unit

FOS—Flying Operations Supervisor

FIH—DoD Flight Information Publication (Enroute) Flight Information Handbook

FY—Fiscal Year

GBU—Guided Bomb Unit

GCC—Geographic Combatant Commander

GCS—Ground Control Station

GLS—GPS Landing System

GMT—Greenwich Mean Time

GPS—Global Positioning System

HDD—Head-Down Display

HUD—Head-Up Display

IAF—Initial Approach Fix

IFR—Instrument Flight Rules

IMC—Instrument Meteorological Conditions

INS—Inertial Navigation System

IO—Intelligence Oversight

IQT—Initial Qualification Training

IR—Infrared

JRCC—Joint Rescue Coordination Center

JTAC—Joint Terminal Air Controller

KGS—Knots Ground Speed

KIAS—Knots Indicated Airspeed

LEMA—Linear Electro-Mechanical Actuator

LOS—Line of Sight

LOWAT—Low-Altitude

LoX—Letter of Xs

L/R—Launch and Recovery

LR—Launch and Recovery

LRD—Laser Range Designator

LRE—Launch and Recovery Element

LRGCS—Launch/Recovery Ground Control Station

MAGW—Maximum Allowable Gross Weight

MAJCOM—Major Command

MAP—Missed Approach Point

MCE—Mission Control Element

MD—Mission Director

MDA—Minimum Descent Altitude

MFR—Memorandum For Record

MHz—Megahertz

mIRC—Multi-User Relay Chat

MOA—Military Operations Area

MoA—Memorandum of Agreement

MOU—Memorandum of Understanding

MQT—Mission Qualification Training

MSA—Minimum Safe Altitude

MTOW—Maximum Takeoff Weight

MTS—multispectral targeting system

NAS—National Airspace System

NGA—National Geospatial-Intelligence Agency

NGB—National Guard Bureau

NM—Nautical Mile

OG/CC—Operations Group Commander

OPR—Office of Primary Responsibility

Ops—Operation(S)

ORM—Operational Risk Management

PAR—Precision Approach Radar

PIC—Pilot In Command

POAM—Program Objectives and Milestones

PSO—Pilot/Sensor Operator

PUM—Proper Use Memorandum

QIA—Questionable Intelligence Activities

RCO—Range Control Officer

RCR—Runway Condition Reading

ROE—Rules Of Engagement

RTB—Return To Base

RVR—Runway Visual Range

SAR—Search And Rescue

SATCOM—Satellite Communication

SecDef—Secretary of Defense

SFO—Simulated Flame-Out

S/HSM—Sensitive/Highly Sensitive Matters

SM—Statute Mile

SMS—Stores Management System

SO—Sensor Operator

SOF—Supervisor of Flying

SPINS—Special Instructions

Sq/CC—Squadron Commander

STORM—Safety, Tactical, Operation, Reliability, and Maintenance

TEMPO—Temporary

TES—Test and Evaluation Squadron

TOLD—Takeoff and Landing Data

TOT—Time on Target

TRSS—Training Support Squadron

TTL—Training Task List

UAS—Unmanned Aircraft Systems

U.S.—United States

USAF—United States Air Force

VFR—Visual Flight Rules

VVI—Vertical Velocity Indicator

Office Symbols

ACC/A3—Air Combat Command Director of Operations

ACC/A3AA—Air Combat Command Airspace Operations Branch

ACC/A3M—Air Combat Command Persistent Attack and Reconnaissance Division

ACC/A3MQ—Air Combat Command MQ-9 Operations Branch

ACC/A3TV—Air Combat Command Standardization and Evaluation Branch

ACC TRSS/Det 8—Air Combat Command Training Support Squadron Detachment 8

AFFSA/XOF—Air Force Flight Standards Agency Flight Directives

DoD/ASD (HD&GS)—Assistant Secretary of Defense for Homeland Defense and Global Security

DoD/OGC—Department of Defense General Counsel

DoD/US (DI&S)—*Under Secretary of Defense for Intelligence and Security*

SecDef—*The Secretary of Defense*

Terms

Automatic Takeoff and Landing Capability (ATLC)—The capability on the MQ-9 to automatically takeoff and land the aircraft. Capability is functional by either an LRE or an MCE via LOS or Beyond Line of Sight (BLOS).

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; any operations below 2,000 feet AGL; LRE/MCE handoff operations; near border operations IAW applicable Area of Operations Special Instructions and/or local procedures; laser employment, 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.

Intelligence Activities—Refers to all activities that DoD intelligence components are authorized to undertake pursuant to Executive Order (EO) 12333, *United States Intelligence Activities*. It includes counter-intelligence, foreign intelligence and intelligence-related activities.

(In work) Intelligence—related Activities—Those activities outside the consolidated defense intelligence program (funded by intelligence) that: respond to operational commanders' tasking for time-sensitive information on foreign entities; respond to national intelligence community tasking of systems whose primary mission is support to operating forces; train personnel for intelligence duties or provide an intelligence reserve (***Specifically*** excluded are research and development

outside the consolidated defense intelligence program and programs that are so closely integrated with a weapon system that their primary function is to provide immediate-use targeting data).

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

Launch and Recovery (L/R)—Describes the operations pertaining to pre-takeoff, takeoff, initial departure (before Gaining Handover), terminal area operations (after Losing Handover), landing, and post-landing ground operations. This term is utilized for both automatic and manual operations. When more specific requirements or situation is intended, LOS L/R or SATCOM L/R will be used.

Launch and recovery element (LRE)—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 Launch/Recovery Ground Control Station (LRGCS) or GCS. Operations may entail LOS operations for manual or automatic control.

LOS L/R—Describes the traditional LRE model for launch and recovery with LOS. This term is generally synonymous with LRE, but consideration must be given not to include ATLC (SATCOM or LOS) operations with LOS L/R.

Launch and recovery ground control station (LRGCS)—A modified GCS configuration equipped with the functionality of two P/SO racks and associated systems, a communications interface and a ground data terminal. Mission systems are not part of the configuration and an LRGCS is not intended to retain any satellite communications capability.

Mission control element (MCE)—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.

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

Minimum Aircrew—Minimum GCS aircrew 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. **(T-3)** During live and/or actual weapons employment involving a laser, a sensor operator must operate the laser. **(T-2)**

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).

Satellite Launch and Recovery (SATCOM L/R)—Launch and Recovery operations over SATCOM controlled with ATLC. SATCOM L/R used only in MCE context.

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)

A2.4.6.1. Time

A2.4.6.2. Altitude

A2.4.6.3. MSA

A2.4.6.4. Bingo Fuel (IFR/VFR)

A2.5. Tactical Admin:

A2.5.1. Ingress Routing/Altitude/Airspeed

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:

A2.7.1. Target/Waypoint #

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. Manual/Automatic Takeoff (as applicable)/Departure Plan

A2.9.3. Sensor Operator Responsibilities/Calls

A2.9.4. Recovery/Manual/Automatic Landing (as applicable)

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. Divert / Forced Landing Locations

A2.12.3.4. Recovery/Landing emergencies

A2.12.3.5. Hung Ordinance

A2.13. Debrief time/place:

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

Attachment 3

MQ-9 EXTENDED RANGE (ER) GUIDANCE

A3.1. General Guidance. Contents of this attachment and guidance apply to MQ-9 Block 5 ER (-20 configuration) with external tanks loaded. ER aircraft without external tanks do not follow this guidance.

A3.2. Aircraft Handling. Aircrew operating MQ-9 ER aircraft supporting contingency operations remain aware of certain aircraft handling characteristics. High Angle Of Attack (AOA) has been observed during banked turns while using altitude hold climbs, triggering stall protect. Similar AOA spikes were noted when hold mode and stall protect were off.

A3.3. Heavy Weight Takeoff and Landing . Lack of validated takeoff and landing data will require aircrew to reference *General Atomics ER Engine-out Landing Distance Analysis* for takeoff distances. **(T-3)**

A3.3.1. When heavyweight, the required takeoff roll distance may exceed available runway length. MQ-9 ER incorporates the Alcohol Water Injection (AWI) system to reduce the aircraft's takeoff roll and increase initial climb performance. However, to allow for a safety margin in case of AWI failure, aircrew will not take off if the calculated Non-AWI takeoff distance exceeds runway available. **(T-3)**

A3.3.2. If a flaps automatic retraction condition occurs, aircrew monitor: airspeed, altitude, vertical velocity indicator (VVI) and AOA.

A3.4. Maneuvering. Aircrew consider maneuvering capability under heavy weight conditions during LRE and MCE operations. Climb rate decreases and turn radius increases significantly. Pitch angles greater than 5 degrees and roll angles greater than 15 degrees may cause high AOA conditions. Aircrew should coordinate with controlling agencies for departure considerations.

A3.4.1. MCE aircrew must account for this decreased maneuverability and increased altitude block requirements when operating above 10,500 lbs during target tracking and weapons employment which may lead to excessive altitude deviations (e.g., operating in "the stack"). **(T-3)**

A3.4.2. Combat ceiling at 11,700lbs maximum takeoff weight (MTOW) is approximately Flight Level (FL) 220. No further data is validated to determine actual ceiling limitations. Coordinate accordingly with controlling agencies.

A3.5. AOA Limitations . Monitor AOA while operating under heavy weight configurations. Heavy weight configuration is defined as having a gross weight greater than 10,500 lbs.

A3.5.1. AOA should not be allowed to exceed 7 degrees during flight. If the "Stall conditions – approaching limits" or "Stall conditions – exceeding limits" warnings appear in the HDDs, take actions to reduce AOA immediately. Furthermore, if the aircraft exhibits uncommanded pitch, roll, yaw or buffeting and/or vibration is noticed, execute Loss of Control Prevent, Stall Recovery or Spin Recovery checklists as required.

A3.5.2. Stall protect shall be enabled to the maximum extent possible when operating in heavy weight configurations. **(T-3)**

A3.6. Angle of Bank (AoB) . Follow TO 1Q-9(M)A-1 AoB guidance, avoiding aileron tip stall override and stall protect override.

A3.7. Approach speeds. Approach speeds in excess of 134 KIAS will result in auto flap schedule which may result in challenging aircraft control and airspeed characteristics. Current TO-1 High Key and Low Key altitudes do not account for aircraft weights above 10,500 lbs and published altitudes may be unachievable during engine out overhead approaches.

A3.8. MQ-9 ER Heavyweight Approaches. During initial and currency flight training, launch and recovery aircrew are restricted to the following landing pattern restrictions:

A3.8.1. All non-SFO heavyweight approaches will be accomplished via a straight-in approach. **(T-3)** Aircrew will perform a go-around commencing no lower than 200 feet. **(T-3)**

A3.8.2. Touch-and-go landings will not be accomplished above 8,500 lbs except in cases of an emergency. **(T-3)**

A3.8.3. Ground-track adjustments for heavyweight patterns will be coordinated with local ATC prior to the first flight of MQ-9ER at gross weights exceeding 10,500 lbs. **(T-3)**

A3.9. Emergency Mission. Account for reduced maneuvering and performance when programming the emergency mission for both LRE and MCE operations. Account for additional distance clearances when determining emergency mission routing to avoid terrain, weather, and airspace.

Attachment 4

SAMPLE DOMESTIC UAS OPERATIONS REPORT FORMAT

A4.1. Domestic UAS Operations Report . Report all domestic MQ-9 operations (excluding training, exercises, repositioning, research, development, testing, and evaluation) to ACC/A3M, due annually on 1 October in accordance with **paragraph 9.2**.

MEMORANDUM FOR ACC/A3M

FROM: (Insert reporting unit)

SUBJECT: Fiscal Year 20__ Domestic Unmanned Aircraft System (UAS) Use Report

1. ___ ATKS accomplished ___ domestic UAS operations events in the FY__ reporting period. A total of ___ flying hours were dedicated to these events. The following sub paragraphs detail each event as required by AFMAN 11-2MQ-9V3. Blocks a through h are completed for each event.

a. Supported and/or requesting agency:
b. Operational authority followed:
c. Date event occurred, include GMT beginning and end times:
d. Description of mission requirement or objective:
e. Sensors employed:
f. Information collected:
g. Information retained:
h. Information disseminated and to whom it was released:

2. Additional details may be provided by contacting the POC listed in each occurrence.

3. My POC for this report is _____.

XXXX
Commander, ATKS

1st Ind, (Endorsing OG or ATKG), Fiscal Year 20__ Domestic Unmanned Aircraft System (UAS) Use Report

MEMORANDUM FOR ACC/A3M

XXXX
Commander, OG or ATKG

Attachment 5

DOD DOMESTIC USE OF UAS AUTHORITIES MATRIX

A5.1. DoD Domestic Use of UAS Authorities Matrix. The decision matrix in **Table A5.1** is used to determine the approval authority for particular domestic UAS operations.

Table A5.1. DoD Domestic Use of UAS Authorities Matrix.

Domestic UAS Operations	UAS Groups	Approval Authority	Delegation	Applicable Guidance	Amplification of Guidance
Counter intelligence or foreign intelligence or intelligence related activities	All	As determined by the head of the DoD Intelligence Component concerned	No	For FI/CI: AFPD 14-4; For Intelligence Related Activities: AFPD 14-4; DoDD 5148.11 AFI 13-201	Only Defense Intelligence Components are authorized to conduct counter intelligence/foreign intelligence. Intelligence Oversight (IO) rules apply.
Defense Support of Civil Authorities (DSCA) - General	All	SecDef	No	DoDD 3025.18; Standing DSCA EXORD	For search and rescue and incident awareness and assessment
DSCA - Support of civilian law enforcement agencies	All	SecDef	No	18 U.S.C.§1385; 10 U.S.C.§§271-284; DoDD 3025.18; DoDI 3025.21; DoDI 5505.17	

DSCA - Search and Rescue (SAR) involving distress or potential loss of life, including support of U.S. Coast Guard maritime search and rescue	All	Geographic Combatant Commander (GCC)	No	DoDD 3025.18; DoDI 3003.01; Standing DSCA EXORD; National Search and Rescue Plan	GCCs may approve domestic use of DoD UAS on an Air Force Rescue Coordination Center (AFRCC)/ Alaska Rescue Coordination Center (AKRCC)/ Joint Rescue Coordination Center (JRCC) - Pacific/U.S. Coast Guard-coordinated mission with a properly issued SAR mission number.
Training exercises, and repositioning operations within airspace delegated by the FAA for DoD use. (See Note)	All	Installation Commander	Yes; as determined by the Installation Commander but not further delegable below an O-6 level commander responsible for flight operations.	MOU DoD-FAA UAS Operations in the NAS	Includes repositioning operations and direct transit to and from the training and exercise airspace delegated by the FAA for DoD use.

Training and exercise exceptions: - Training and exercises with armed UAS outside restricted and warning areas - Training ICW civilian law enforcement agencies	All	SecDef	No		DoD component heads will submit appropriate requests to the ASD (HD&GS) at least 30 days prior to projected use.
Counter-drug operational support	All	Geographic Combatant Commander (GCC)	No	CJCSI 3710.01B	If delegated by SecDef for counter drug operational support in CJCS Instruction 3710.0IB
Research development, test and evaluation within airspace delegated by the FAA for DoD use.	All	Installation Commander	Yes; as determined by the Installation Commander but not further delegable below an O-6 level commander responsible for flight operations.	DoDI 3200.18	Includes direct transits to and from the research development, test, and evaluation airspace delegated by the FAA for DoD use.

Note: Airspace delegated by the FAA for DoD use includes: Special Use Airspace delegated by the FAA for DoD use; temporary Air Traffic Control Assigned Airspace Areas; airspace above land with express permission of the landowner or government-owned or -leased land as permitted by DoD-FAA MOA; U.S. National Airspace delegated by the FAA for DoD use to provide air traffic services, U.S. National Airspace under an approved FAA Certificate of Waiver or Authorization (COA); and airspace delegated by the FAA and coordinated with DoD for permanent, long-term, and short-term requirements.

Attachment 6

AUTOMATIC TAKEOFF AND LANDING CAPABILITY (ATLC) AND SATCOM L/R PROGRAMMATIC GUIDANCE

A6.1. General Guidance. Guidance contained in this attachment applies to phased implementation of MQ-9 ATLC operations. MAJCOMs and units will adhere to ACC Program Objective and Milestone (POAM) timelines for ATLC fielding as it is updated. **(T-2)**

A6.2. AFMAN 11-2MQ-9 Series Updates. All three volumes of AFMAN 11-2MQ-9 will undergo unscheduled updates over the next several years to manage ATLC implementation. When appropriate, subsequent or clarifying guidance will be issued via Flight Crew Information File (FCIF). Once ATLC is fully implemented, to include force adjustments to LRE units (with associated risk assessment), these volumes will stabilize to an ATLC-only standard.

A6.3. ATLC Approval. ATLC is an approved capability for MQ-9 operations starting with Operational Flight Plan (OFP) 2409, and IAW this publication. In determining airfields approved for ATLC, OG/CCs will release local guidance for ATLC operations. **(T-2)**

A6.4. ATLC Training and Certification/Qualification.

A6.4.1. Certification/Qualification: ATLC will be a certification (similar documentation to current LRE on AF Form 8, *Certificate of Aircrew Evaluation*) during initial stages of ATLC fielding, as implemented with the Volume 2 released concurrent to this manual. **(T-2)** Documentation of initial certification on an AF Form 4348, *USAF Aircrew Certifications* or Letter of Certifications (LoX), then subsequent certifications on AF Form 8 is intended to ease transition toward ATLC becoming part of the baseline QUAL as ATLC reaches full implementation. Units maintain ATLC as a certification until a follow-on Volume 2 directs a shift to a qualification. **(T-2)**

A6.4.2. Training: ATLC implementation requires concurrent field and FTU training.

A6.4.2.1. Field Training. Units will develop local ATLC training programs utilizing ACC approved ATLC related Training Task Lists (TTLs) produced and managed by ACC Training Support Squadron Detachment 8 (TRSS/Det 8) for implementation in Initial Qualification Training (IQT) **(AFSOC: N/A)**, and training materials available from 556th Test and Evaluation Squadron (TES). ATLC training programs will be documented and managed as a Mission Qualification Training (MQT) program with OG/CC oversight, approval, and waiver authority. **(T-2)** Commanders balance training for ATLC certified crews with ongoing MQT and upgrade requirements until units begin receiving ATLC certified crews from IQT. **(T-2)**

A6.4.2.2. FTU Training. ATLC will be incorporated in the AETC MQ-9 IQT syllabus. Commanders should not expect to receive ATLC certified IQT graduates before mid-calendar year 2023.

A6.5. Automatic Approaches. Units will build automatic approaches using AFMAN 11-230 self-contained approaches guidance to the maximum extent possible. When unable to comply with AFMAN 11-230 guidance for self-contained approaches, follow MAJCOM-Certified Procedures per AFMAN 11-202 Volume 3 as supplemented.

A6.6. Weather Guidance.

A6.6.1. ATLC approaches will apply weather guidance for manual approaches per **Chapter 4**. **(T-3)** However, OG/CCs (delegated no lower than Squadron Commander (Sq/CC) or equivalent) may authorize Block 5 aircraft equipped with a RADAR altimeter to execute landings down to 0 feet ceiling and 0 SM visibility (0/0) **(T-2)** OG/CCs (delegated no lower than Sq/CC or equivalent) may authorize Block 5 aircraft equipped with a laser altimeter to execute landings down to 300 feet ceiling and 2 SM visibility (0/0). **(T-2)**

A6.6.2. ATLC operations are approved below VFR minimums if the terminal environment is within radar coverage and under radar control from ATC. **(T-2)** Additionally, aircrew shall use the ATLC pattern that has been coordinated with local airfield authorities ensuring obstacle clearance. **(T-2)** Pilots will not disengage ATLC after beginning an IMC takeoff or approach, except for safety of flight or ATC direction. **(T-3)**

A6.6.3. Aircrew will utilize takeoff minimums prescribed in **Chapter 4** unless OG/CC approved for 0/0 (or 300/2) operations with ATLC. **(T-2)** Regardless of OG/CC approval, crews will apply alternate and fuel reserve minimums per **Chapter 4**. **(T-2)**

A6.7. Diverts and Alternates. OG/CCs will provide guidance for divert operations via **Chapter 8**, **paragraph 8.5** **(T-2)** For all OFPs, diverts to locations without a written agreement are not authorized. **(T-2)**

A6.7.1. Diverts. Diverts to non-LRE locations are authorized under emergency conditions for an automatic landing provided an agreement is in place with the airfield manager to ensure safe clearing of the runway and recovery of the aircraft. **(T-2)** Inability of the aircraft to break out of the weather by defined minimums when an alternate LRE is not available constitutes emergency conditions. Divert operations utilizing ATLC do not constitute planned alternates, and do not constitute IFR alternate filing requirements per AFMAN 11-202V3, para 4.16 due to restrictions of AFMAN 11-202V3, para 4.8.1.

A6.7.2. Alternates. OG/CC's are responsible for submitting divert locations to MAJCOMs for approval as alternates, per AFMAN 11-202. **(T-2)** Submit requests for MAJCOM approved alternates with copies of airfield agreements and local operating guidance for review. After MAJCOM approval, units will follow AFMAN 11-202V, para 4.16 IFR alternate filing requirements for daily operations. **(T-2)** If weather at destination and alternate locations preclude meeting AFMAN 11-202V3 paragraphs 4.1.2 and 4.16.4, and MAJCOM approved LRE or ATLC alternates are not available, then aircrew may utilize the holding in lieu of guidance contained in this Volume, **Chapter 4**, paragraphs **4.2.1.2.1** through **4.2.1.2.3**. **(T-2)**

A6.8. Operational Risk. The MQ-9 is approved for ATLC operations via the airworthiness process and current Military Flight Release. Local commanders must balance this risk against mission accomplishment considering operating environment, aircrew training, runway/local environment, and aircrew familiarity with ATLC operations. OG/CC's may further restrict guidance in this publication to balance that risk.

A6.9. Local Guidance. OG/CC will publish local ATLC guidance prior to commencing ATLC operations. **(T-2)** Guidance must include: ATLC training program, automatic takeoff/landing minimums, Ku/LOS shadow operations, local airfield operating guidance, ATLC pattern standards, agreements with ATC, agreements with divert locations, procedures for clearing runway of obstacles during 0/0 (or 300/2) operations, and ATLC CRM considerations. **(T-2)**