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Flying Operations

RQ-1--OPERATIONS PROCEDURES



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This volume implements AFD 11-2, *Aircraft Rules and Procedures*; AFD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. This volume prescribes standard operations procedures for United States Air Force (USAF) RQ-1 aircraft and applies to all RQ-1 units. This volume does not apply to Air National Guard or Air Force Reserve Command units and members. Headquarters (HQ) Air Combat Command (ACC) will forward proposed major command (MAJCOM) supplements to this volume to HQ Air Force Flight Standards Agency (HQ AFFSA/XOF) for approval prior to publication in accordance with (IAW) AFD 11-2, paragraph 4.2. HQ ACC will provide a copy of approved and published MAJCOM-level supplements to HQ AFFSA/XOF. Field units below MAJCOM level will forward copies of their supplements to this volume to their parent MAJCOM office of primary responsibility (OPR) for post-publication review. Maintain supplement currency by complying with AFI 33-360V1, *Publications Management Program*; and AFI 37-160V8, *Air Force Publications and Forms Management Program--Developing and Processing Forms*. Submit suggested improvements to this publication on AF Form 847, **Recommendation for Change of Publication**, through channels to HQ ACC/DOTR, 205 Dodd Blvd, Ste 101, Langley AFB, VA 23665-2789. ACC/DOTR will staff/consolidate recommended changes and forward proposed interim changes to HQ AFFSA/XOF 1535 Command Drive, Suite D-309, Andrews AFB, MD 20762-7002. HQ USAF/XO is the approval authority for changes to this publication.

Chapter 1—GENERAL INFORMATION

	4
1.1. References, Abbreviations, Acronyms, and Terms.	4
1.2. Scope.	4
1.3. Crewmember Responsibility.	4
1.4. Deviations.	5
1.5. Waivers.	5
1.6. Applicability.	5

1.7. Distribution. 5

1.8. Crewmember Definitions. 5

Chapter 2—MISSION PLANNING & BRIEFING 6

2.1. Responsibilities. 6

2.2. Special Mission Requirements. 6

2.3. Maps, Charts, and Flight Logs: 6

2.4. Briefing/Debriefing: 7

Chapter 3—NORMAL OPERATING PROCEDURES 8

3.1. Ground Control Station: 8

3.2. Required Equipment. 8

3.3. Communications. 8

3.4. Checklists. 9

3.5. Engine Start/Taxi: 9

3.6. Runway Requirements: 9

3.7. Takeoff: 10

3.8. Cruise: 10

3.9. Approach/Landing: 10

Chapter 4—INSTRUMENT/WEATHER PROCEDURES 12

4.1. Approach Category. 12

4.2. Weather Minimums, Restrictions, and Planning Factors. 12

4.3. Cold-Weather Operating Procedures: 13

4.4. Hot-Weather Operating Procedures. 14

Chapter 5—ABNORMAL OPERATING PROCEDURES 15

5.1. General. 15

5.2. Ground Emergencies: 15

5.3. In-flight Emergencies: 15

Chapter 6—LOCAL PROCEDURES 16

6.1. General. 16

6.2. Review. 16

6.3. Format. 16

AFI11-2RQ-1V3 28 FEBRUARY 2002	3
6.4. Content.	16
6.5. Forms Adopted.	16
Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION	17
Attachment 2—MISSION BRIEFING GUIDE	20
Attachment 3—PILOT CHANGEOVER BRIEFING GUIDE	23
Attachment 4—SO CHANGEOVER BRIEFING GUIDE	24
Attachment 5—DEMPC CHANGEOVER BRIEFING GUIDE	25
Attachment 6—MISSION DEBRIEFING GUIDE	26
Attachment 7—FENCE CHECKS	27
Attachment 8—COMBAT SEARCH AND RESCUE/ON-SCENE COMMANDER CHECKLIST	29

Chapter 1

GENERAL INFORMATION

1.1. References, Abbreviations, Acronyms, and Terms. See [Attachment 1](#).

1.2. Scope. This volume establishes procedures for operation of the RQ-1 remotely operated aircraft. Use it in conjunction with aircraft flight manuals, Department of Defense Flight Information Publication (FLIP), and applicable USAF directives. Pilots will comply with Federal Aviation Administration Order 7610.4, *Special Military Operations*, Chapter 12, Section 9, Remotely Operated Aircraft, for operations outside special use airspace.

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

1.3. Crewmember Responsibility. In conjunction with other governing directives, this volume prescribes procedures for RQ-1 aircraft operation under most circumstances, but it is not a substitute for sound judgment or common sense. Crewmembers may accomplish operations or procedures not specifically addressed in this volume, if they enhance safe and effective mission accomplishment.

1.3.1. The pilot in the left seat of the ground control station (GCS) is the Pilot In Command (PIC) with responsibility and authority as defined in AFI 11-202V3. The PIC will change during flight as pilots cycle in and out of the left seat during missions. An instructor pilot (IP) performing instructor duties is the PIC regardless of seat position.

1.3.2. The Pilot/Sensor Operator (PSO) racks allow for the pilot to fly from either the left or right seat. For all ground and flight operations, the pilot flying the aircraft will occupy the left seat unless equipment malfunctions dictate use of the right seat (Exception: For relief-on-station (ROS) flights the pilot flying the relieving/relieved aircraft will occupy the right seat). In addition, during critical phases of flight (see [Attachment 1, Terms](#), for definition), a pilot or Sensor Operator (SO) must be in the right seat (Exception: for ROS flights, a pilot or SO will act as a safety observer from a position next to or behind the second pilot flying the relieving/relieved aircraft during critical phases of flight). During non-critical phases of flight, the right seat may be unoccupied. The pilot or SO in the right seat controls the Sensor Ball and has full control of camera selection, focus and zoom. In addition, the pilot or SO in the right seat acts as an additional set of eyes to monitor aircraft status and read checklists.

1.3.3. The SO is responsible for target acquisition, optimal sensor selection for the specific target, and sensor focus. The SO will identify key target features and location on tracker display to allow for easy target re-acquisition.

1.3.4. The Data Exploitation, Mission Planning, and Communication (DEMPC) operator is responsible for maintaining the target list. The DEMPC operator identifies target sequence and the best collection method for specific targets and passes target information to and directs the SO to the target. In addition, the DEMPC operator is responsible for providing the pilot with navigation information for placing the aircraft in the best position for synthetic aperture radar (SAR) collection. The DEMPC operator is responsible for SAR image capture and target identification. The DEMPC operator is also the focal point for ad hoc taskings by planning new target collections and enroute navigation.

1.3.5. All SOs maintain qualification in the SO, DEMPC, and SAR positions and may move between positions during a mission.

1.3.6. Crewmembers participating in an active aircraft mission/flight will not be called out of the GCS to manage non-mission ground matters. In addition, unit commanders will ensure all crewmembers participating in an active aircraft mission/flight are focused on their mission/flight responsibilities and not tasked with other ground duties while the mission is underway.

1.4. Deviations. Deviations from these procedures require specific approval of the ACC/DO unless an aircraft emergency or operational necessity dictates otherwise.

1.5. Waivers. Unless specifically noted otherwise in the appropriate paragraph, the waiver authority for all provisions of this volume is ACC/DO. Forward waiver requests through chain of command to ACC/DO for approval. Waivers, if approved, are issued for a maximum of one year from the effective date.

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

1.7. Distribution. Issue each RQ-1 crewmember a copy of this volume.

1.8. Crewmember Definitions. Refer to [Attachment 1](#), *Terms*, for definitions of the RQ-1 Crew, Primary Crew, and Minimum Crew.

Chapter 2

MISSION PLANNING & BRIEFING

2.1. Responsibilities. The pilot is responsible for mission planning and briefing. Mission planning and mission briefing are two separate activities. Pilots and SOs will jointly accomplish mission planning to ensure the best route, sensors, and altitudes are used for target acquisition and threat avoidance.

2.1.1. Commanders will ensure currency of all mission planning materials and compliance with command guidance. Squadron and Forward Operating Location operations officers will schedule adequate mission planning time prior to flight.

2.1.2. Crewmembers other than the crew flying the mission may accomplish mission planning. If operationally necessary, mission elements and events may be modified the day of the flight or while the RQ-1 is airborne as long as changes do not compromise flight safety. The pilot will ensure all crewmembers acknowledge any changes.

2.1.3. Complete sufficient flight planning to ensure safe mission accomplishment. Areas covered will include, at a minimum, weather, fuel requirements, takeoff and landing data, mission objectives, threat study (when applicable), departure and arrival procedures, communication procedures, and sensor operation.

2.2. Special Mission Requirements. Participation in contingency operations normally will require the deployed unit to establish procedures for coordinating or confirming mission requirements with an Air, Joint, or Combined Operations Center. The Air Tasking Order process may include procedures to identify special mission requirements or to confirm any changes to mission tasking. Deployed unit operations and intelligence functions are jointly responsible for briefing crewmembers regarding any special requirements or tasking updates prior to or during each mission.

2.3. Maps, Charts, and Flight Logs:

2.3.1. Local Area Maps. A local area map of sufficient detail to remain within assigned training areas and identify potential emergency landing sites will be available for display on the PSO Tracker Display. Units will develop procedures to ensure the PSO rack disk and the DEMPC contain current charts.

2.3.2. Enroute Charts/Approach Procedures. Units will ensure current FLIP publications required for RQ-1 flight operations are in the GCS. Units are not required to maintain FLIP terminal instrument procedure books in the GCS except when the RQ-1 is operating from an airfield with a published RQ-1-compatible instrument approach. If the RQ-1-compatible approaches are separately published plates, then only those plates are required in the GCS. For operations outside of special use airspace, crews will annotate airway structure within 10 nautical miles (NMs) of the planned route of flight on the PSO tracker display chart. Units may annotate the ground track from RQ-1-compatible FLIP Standard Instrument Approach Procedures on the PSO Tracker display chart. The approach ground track must be to scale and units will develop procedures to maintain the annotated PSO display chart currency with the actual approach.

2.3.3. Mission Maps and Navigation Route Maps. Display the appropriate current charts (of sufficient scale to provide navigation and terrain and/or obstacle avoidance information) on the PSO

tracker display and DEMPC throughout the mission. Annotate a minimum safe altitude (MSA) on mission maps.

2.3.4. Flight Logs. Use an AF Form 70, **Pilot's Flight Plan and Flight Log**, or approved alternate IAW AFI 11-202V3.

2.4. Briefing/Debriefing:

2.4.1. Briefing Guides. Mission briefing, changeover briefing, and a mission debriefing guide are in [Attachment 2](#), [Attachment 3](#), [Attachment 4](#), [Attachment 5](#), and [Attachment 6](#). Units may augment these guides as necessary. Briefing guides provide the briefer with a reference list of items that may apply to particular missions. Those items published in unit standards and understood by all participants may be briefed as "standard."

2.4.2. Briefing Times. Begin mission briefings at least 1 and one-half hours before scheduled takeoff (1 hour and 15 minutes for functional check flights). Start changeover briefings in sufficient time to complete the briefing prior to crew position changeover.

2.4.3. Mission Brief. The pilot will brief all crewmembers to ensure safe and effective mission accomplishment. Use the following procedures for all mission briefings:

2.4.3.1. All crewmembers scheduled to fly the mission will attend the briefing. Students in combined Initial Qualification Training (IQT)/Mission Qualification Training (MQT) and crewmembers who are logging individual events for currency do not need to attend the mission briefing provided they are under the supervision of an instructor who attended the briefing; however, they must receive a changeover brief in their respective crew position before participating in the flight. Other crewmembers that did not attend a mission briefing must obtain Squadron Operations Officer (SQ/DO) approval prior to participating in a flight. The pilot in command will ensure crewmembers participating in a flight under SQ/DO approval are adequately briefed prior to assuming crew duties.

2.4.3.2. Brief an alternate mission for each flight (if applicable).

2.4.3.3. Mission elements and events may be modified and briefed while RQ-1 aircraft is airborne as long as changes do not compromise flight safety. Do not fly unbriefed missions and/or events. The pilot will ensure all crewmembers acknowledge all changes.

2.4.3.4. The pilot in command will brief plans for fuel conservation.

2.4.4. Changeover Briefs. Individual crewmembers will complete a changeover brief for each crew position changeover. When the current SO and DEMPC operator switch positions, a changeover brief is not required.

2.4.5. Fence Checks. Crewmembers will complete a fence checks ([Attachment 7](#)) on operational missions. Training missions will include fence checks as required to meet training objectives. Units may augment these checklists.

2.4.6. Combat Search and Rescue (CSAR)/On-scene Commander (OSC) Checklist. Use the checklist at [Attachment 8](#) when required to assist in CSAR efforts or act as the OSC for a CSAR. Units may augment this checklist.

2.4.7. Mission Debrief. After changeover or landing, debrief all missions as a crew.

Chapter 3

NORMAL OPERATING PROCEDURES

3.1. Ground Control Station:

3.1.1. The pilot determines crewmember seating and the number of people allowed in the GCS after considering all applicable factors. Normally, the maximum number of persons in the GCS is the minimum required to meet mission requirements. The pilot is the approval authority for visitor seating in the GCS. Only qualified pilots or students under instructor supervision may fly the RQ-1.

3.1.2. Ensure the RQ-1 is not in a critical phase of flight before entering the GCS. While the RQ-1 is taxiing or airborne, all personnel will enter the GCS through the rear door; the front door is for emergencies only.

3.1.3. Place no items (checklists, charts, etc.) behind the throttle, flap lever, and propeller control at any time during ground or flight operations.

3.1.4. The pilot will ensure removal of all classified material from the GCS upon mission completion.

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

3.1.6. Crewmembers will take all unclassified rack one and rack two 8-millimeter (mm) tapes that have system anomalies on write-ups recorded on them to maintenance debrief.

3.1.7. Crewmembers will operate in the GCS only those electronic items necessary for flight and/or mission operations.

3.2. Required Equipment. Flight operations require the following equipment:

3.2.1. Two separate video sources for flight operations. This requirement will include a nose camera plus a sensor ball or chin camera to provide the second video source.

3.2.2. The inertial navigation system (INS) and global positioning systems (GPS) must be operational.

3.2.3. The infrared (IR) sensor must be operational for any missions with a planned night takeoff or landing or for any mission that will be airborne through the night.

3.3. Communications. Crewmembers will use the following crew positions for intercom identification and call up: Pilot, Sensor, IP, ISO (instructor SO), Crew Chief, DEMPC, and SAR. Do not discuss classified information when making radio transmissions.

3.3.1. Ground Communications. The pilot and ground crew will ensure two-way communication during all ground checks and anytime the aircraft's engine is operating on the ground. Two-way communication will be maintained until the pilot releases the ground crew.

3.3.2. In-flight Communications:

3.3.2.1. Limit intercom communications to flight-critical information from start of the "Engine Start" checklist until completion of "Climb" checklist and from initiation of "Arrival" checklist until completion of "Shutdown" checklist.

3.3.2.2. Limit telephone calls to the GCS to time-critical mission- and flight-related items. If the telephone is required for communication with air traffic control authorities, those air traffic control communications take precedence over all other telephone use.

3.3.2.3. Pilots flying the aircraft will not use the telephone during a critical phase of flight.

3.3.2.4. All crewmembers will monitor the intercom and advise the pilot prior to going off intercom and will announce when back on intercom.

3.4. Checklists. Each crewmember will have and refer to appropriate checklists during flight operations to ensure accomplishing required actions.

3.4.1. The pilot or SO in the right seat will read all applicable checklists. The pilot will run the "Pre-flight" checklist while the crew chief and pilot or SO in the right seat ensures accomplishment of all checklist steps. The pilot or SO in the right seat will ensure accomplishment of all checklist items and when completed state "Applicable Checklist Complete."

3.4.2. Do not start the "Pre-Takeoff" and "Before Landing" checklists until calling previous checklists complete.

3.4.3. Do not brief the "Departure Brief" portion of the Pre-Takeoff checklist and the "Arrival Brief" portion of the "Arrival" checklist as "standard."

3.5. Engine Start/Taxi:

3.5.1. All engine starts require a fireguard.

3.5.2. The following apply during taxi operations:

3.5.2.1. The pilot taxiing the aircraft will use the best camera available for the given conditions to taxi the aircraft.

3.5.2.2. If the pilot loses sight of the taxiway centerline, stop the aircraft and attempt to regain visual contact with the centerline. If the pilot cannot regain sight of the centerline, obtain a wing walker before moving the aircraft any further.

3.5.2.3. The SO will use the sensor ball for clearing of obstructions during taxi operations, especially prior to turns. The SO will advise the pilot prior to releasing the sensor ball from position mode.

3.5.2.4. If the pilot is using the Sensor Ball as the primary video source for taxi and a requirement arises to use it for obstacle scanning, bring the aircraft to a complete stop before releasing the Sensor Ball from position mode.

3.5.2.5. Maximum taxi speed is 10 knots ground speed (KGS) on a taxiway, 20 KGS on a runway, and 5 KGS in a turn.

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

3.6.1. Minimum runway length is 5000 feet.

3.6.2. Minimum runway width is 75 feet.

3.6.3. Minimum taxiway width is 50 feet.

3.7. Takeoff:

- 3.7.1. Do not taxi and/or takeoff over a raised cable or takeoff into a raised webbing-type barrier. Pilots may takeoff beyond or between raised cables provided there is 5000 ft of runway beyond or between barriers.
- 3.7.2. During departure/arrival the crewmember occupying the right seat will advise the pilot of any deviations from Air Traffic Control clearance.
- 3.7.3. When radar facilities are available, crews will request a radar-monitored departure.
- 3.7.4. For the first 20 minutes of flight, maintain an engine-out glideback capability unless operational requirements dictate otherwise.
- 3.7.5. Place the Sensor Ball in position mode with the proper trims set for landing and display flight graphics on both PSO racks until at least 500 ft above ground level (AGL).

3.8. Cruise:

- 3.8.1. After climbing above 500 ft AGL, crewmembers may use the Sensor Ball in the rate mode and select payload graphics.
- 3.8.2. DEMPC will accomplish a target brief prior to prosecuting each target. Target briefs will include, as a minimum, target number, description, and essential elements of information (EEI).
- 3.8.3. Place the Sensor Ball in position or target mode prior to each shift change.

3.9. Approach/Landing:

- 3.9.1. The pilot or SO in the right seat will place the Sensor Ball in position mode and ensure display of flight graphics no later than 500 feet AGL.
- 3.9.2. The desired touchdown zone for a visual approach is 500 - 1500 feet from the threshold, or the glide path interception point for a precision approach. When local procedures or unique runway surface conditions require landing beyond a given point on the runway, adjust the desired touchdown zone accordingly and brief applicable crewmembers.
- 3.9.3. Do not accomplish touch-and-go landings until the aircraft gross weight is below 2000 pounds. Pilots in IQT/MQT may perform touch-and-go landings under instructor supervision IAW syllabus requirements. Pilots certified by the Squadron Commander may perform touch-and-go landings without supervision. Non-certified pilots may accomplish touch-and-go landings whenever there is an IP or flight examiner in the GCS to monitor the landings. Refer to AFI 11-2RQ-1V1, *RQ-1--Crew Training*, [Chapter 5](#), for touch-and-go landing certification procedures.
- 3.9.4. Do not land or accomplish touch and goes over raised webbing-type barriers. Pilots may land or accomplish touch and goes beyond raised cables provided that there is 5000 feet remaining to the runway end or the next raised cable.
- 3.9.5. During go-around or low approaches, do not track directly over aircraft on the runway at low altitude. Make low approaches (day or night) so that touch down does not occur.
- 3.9.6. Comply with wake turbulence avoidance criteria for a small aircraft (category 1).

3.9.7. Pilots will not practice night nose-camera landings. Pilots will practice night nose camera low approaches per the IQT/MQT syllabus or AFI 11-2RQ-1V1, **Chapter 4** continuation training requirements.

3.9.8. Pilots will not exceed 1200 feet per minute (FPM) descent rate on final approach and will establish normal glide path by 200 feet AGL. Descent rates greater than 600 FPM from threshold to flare require a go-around.

3.9.9. Fuel requirements are:

3.9.9.1. Normal Recovery Fuel. Pilots will plan to land with a minimum 50 pounds of fuel.

3.9.9.2. Minimum Fuel. Declare minimum fuel as soon as it becomes apparent that an aircraft will land with 40 pounds of fuel.

3.9.9.3. Emergency Fuel. Declare emergency fuel as soon as it becomes apparent that an aircraft will land with 25 pounds of fuel.

Chapter 4

INSTRUMENT/WEATHER PROCEDURES

4.1. Approach Category. The RQ-1 is an approach category A aircraft.

4.2. Weather Minimums, Restrictions, and Planning Factors. The RQ-1 is a weather category 1 aircraft.

4.2.1. Ceiling and Visibility:

4.2.1.1. Operational and Training: Operating the RQ-1 with ceiling and/or visibility below visual flight rules minimums requires a published Airport Surveillance Radar or a Precision Approach Radar terminal approach procedure at the operating airfield. The RQ-1's INS/GPS is not certified for flying GPS instrument approaches. The RQ-1 is unable to land at an alternate airfield; therefore, RQ-1 pilots cannot declare an alternate airfield. HQ Air Force Flight Standards Agency waived the alternate airfield requirements provided pilots comply with the following ceiling and visibility restrictions for the RQ-1 operating airfield (refer to AFI 11-202V3, ACC Supplement 1, for the waiver number and expiration date).

4.2.1.1.1. The worst weather (TEMPO or prevailing) must be at or above a ceiling of 800 feet or 500 feet above the lowest compatible published landing minima (whichever is greater), and a visibility of 2 miles or 1 mile above the lowest compatible published landing minima (whichever is greater). The weather must be at or above these minima at takeoff and be forecast to be at or above these minima until takeoff plus one hour and at ETA minus two to plus two hours.

4.2.1.1.2. When the ceiling is below 3000 feet or the visibility is below 3 miles, RQ-1 crewmembers will increase recovery fuel to allow the aircraft to hold for a minimum of two hours then penetrate and land with normal recovery fuel.

4.2.1.1.3. While airborne, if the forecast weather for ETA (-2/+2 hours) drops below the minima specified in paragraph 4.2.1.1.1. above, the crew will terminate the mission in time to return the aircraft to the operating base before the forecast time of weather deterioration. In addition, terminate the mission in time to return the aircraft to the operating base with sufficient fuel to hold (if required) for a minimum of four hours.

4.2.1.1.4. While airborne, if the actual weather deteriorates faster than forecasted and is below the minima specified in paragraph 4.2.1.1.1. above at the actual time of arrival, RQ-1 pilots are authorized to fly to pilot weather category or published approach minimums, whichever is higher, if necessary to recover the aircraft.

4.2.1.2. Functional Check Flight. Functional check flights may only be performed in daylight conditions with a ceiling of 2500 feet or greater and visibility of 3 miles or greater.

4.2.2. Turbulence:

4.2.2.1. Do not takeoff if forecast turbulence is greater than moderate or if moderate or greater turbulence is reported along the route of flight. If the forecast is for greater than moderate turbulence, but reliable pilot reports indicate less than moderate turbulence for the planned route of flight, the pilot may elect to take off and proceed with the mission after considering the time, location, and aircraft type of the pilot reports.

4.2.2.2. Discontinue flight if conditions cannot be maintained at less than moderate turbulence.

4.2.3. Wind:

4.2.3.1. Maximum crosswind component for touch-and-go landings is 10 knots. Refer to RQ-1 flight manuals for other wind limitations.

4.2.3.2. The RQ-1's long endurance and inability to land at an alternate airfield present a problem when forecast winds exceed aircraft limits for part of a planned mission. Pilots will comply with the following regarding forecast winds:

4.2.3.2.1. Forecast winds must be within flight manual limits until takeoff plus one hour and at ETA minus two to plus two hours.

4.2.3.2.2. While airborne, if revised forecast winds for ETA (-2/+2 hours) exceed limits specified in RQ-1 flight manuals, the pilot will terminate the mission in time to return the aircraft to the operating base before the forecast time of increased winds or, terminate the mission in time to return the aircraft to the operating base with sufficient fuel to hold (if required) for a minimum of four hours.

4.2.4. Emergency Lost Link Mission Planning. Maintain awareness of prevailing weather along the route of flight, Lost Link/Emergency Mission route of flight, and the landing field by all available means. Continually update the Emergency Mission to account for weather hazards (e.g., cloud layers, icing, turbulence, etc.) along the proposed route of flight to home station. Alter the route, if necessary, and use care to select appropriate aircraft parameters to avoid hazardous weather conditions while complying with Air Traffic Control clearances.

4.3. Cold-Weather Operating Procedures:

4.3.1. Rain/Snow/Freezing Precipitation and Frost. (Defined as moisture that can accumulate on aircraft surfaces.)

4.3.1.1. General (All Configurations):

4.3.1.1.1. Do not takeoff with any frost, ice, or snow accumulation on the wings. Whenever the outside air temperature is less than 40 degrees Fahrenheit or the pilot is concerned about frost, apply an ice retardant to the wings or inspect the aircraft for frost immediately prior to takeoff.

4.3.1.1.2. Precipitation adversely affects aircraft performance and reduces visibility. If conditions permit, pilots should minimize exposure to all types of precipitation during all phases of flight.

4.3.1.1.3. To the maximum extent possible, pilots should avoid penetration of visible moisture or precipitation, particularly above the freezing level. If precipitation cannot be avoided, pilots should maximize climb or descent rate to exit potential or actual icing conditions. If encountering icing, SOs should turn the EO/IR sensor ball aft to prevent ice formation on the lens face and thus allow use of the sensors to scan flight surfaces and the visual ice detector for ice build-up.

4.3.1.2. Standard Wing Configuration:

4.3.1.2.1. Do not conduct flight into forecast icing greater than light. Do not conduct flight into known icing conditions. If encountering icing in flight, take action to exit icing conditions. Whenever suspecting aircraft icing, the search for clear air and a visual inspection of the aircraft become mission priorities.

4.3.1.2.2. For the RQ-1A, add 10 knots indicated airspeed to approach speed if rain, snow, or freezing precipitation is present. For the RQ-1B, refer to the flight manual wet-wing performance data.

4.3.1.3. Anti-ice "Wet" Wing Configuration. Operations may be conducted into forecast or actual icing conditions up to and including moderate. The anti-ice system is designed to allow climbs or descents through icing conditions and is not intended for continuous operation in any icing conditions. Prior to takeoff, pilots shall ensure that planned flight through forecast or actual icing will not exceed the capabilities and limitations of the anti-ice system as described in T.O. 1Q-1(R)B-1 *USAF Series RQ-1B System Flight Manual*. Refer to the flight manual for wet-wing performance data.

4.3.2. Runway/Taxiway Conditions:

4.3.2.1. Do not taxi with a runway condition reading (RCR) less than 5. Do not takeoff or land with RCR less than 12.

4.3.2.2. When no RCR is available, refer to International Civil Aviation Organization conversions in the Flight Information Handbook.

4.3.2.3. Handling characteristics of the RQ-1 on ice or snow are not optimum. 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 5 KGS. If required to stop, plan to stop over clear portions of the taxiway, if able. The pilot will remain focused on the outside video display at all times.

4.4. Hot-Weather Operating Procedures. The RQ-1 is extremely sensitive to hot-weather conditions. Crewmembers should increase RQ-1 systems temperature monitoring. For example: a rising left tailboard temperature is an indication of a potential overheat.

Chapter 5

ABNORMAL OPERATING PROCEDURES

5.1. General. This chapter contains procedures to follow when other-than-normal operations occur. The procedures in this chapter do not replace or supersede procedures contained in the flight manual or the use of sound judgment.

5.1.1. Do not accept an aircraft for flight with a malfunction that is addressed in the emergency section of the flight manual until maintenance accomplishes appropriate corrective actions.

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

5.2. Ground Emergencies:

5.2.1. Do not taxi the aircraft with nose-wheel steering, brake system, video, or telemetry malfunctions.

5.2.2. Ground crews using the appropriate equipment will recover an aircraft after inadvertent entry onto soft, unprepared surfaces.

5.2.3. Crewmembers will ensure the Tactical Endurance Synthetic Aperture Radar (TESAR) sensor and the Ku-band data link are not transmitting before allowing anyone to approach the aircraft.

5.3. In-flight Emergencies:

5.3.1. Mission Aborts. Abort the mission, regardless of apparent damage or subsequent normal operation, for any of the following: bird strike, over-G, flight control system anomalies, or engine failure.

5.3.2. Landing Gear Malfunctions. If encountering a landing gear malfunction and the gear are down, leave them down and make a full-stop landing.

5.3.3. Forced Landing: Comply with forced landing procedures in the flight manual. If a Ku-band forced landing to a runway or primary site cannot be completed without endangering personnel or property on the ground, then another site will be selected even if attempting a landing at that alternate site may result in destruction of the RQ-1 aircraft.

Chapter 6

LOCAL PROCEDURES

6.1. General. This chapter is for unit local operating procedures. Procedures herein will not be less restrictive than those contained elsewhere in this regulation, nor will this chapter be a single-source document for procedures contained in other directives or regulations. Avoid unnecessary repetition of guidance provided in other established directives; however, reference to those directives is acceptable when it serves to facilitate location of information necessary for local operating procedures.

6.2. Review. Forward a copy of this chapter to ACC/DOTR for review, comments, and required changes as appropriate. This procedure need not delay distribution.

6.3. Format. Organize the local chapter in the following format:

- 6.3.1. Introduction.
- 6.3.2. General Policy.
- 6.3.3. Mission Planning.
- 6.3.4. Ground Operations.
- 6.3.5. Flying Operations.
- 6.3.6. Local Airspace Procedures.
- 6.3.7. Abnormal Procedures.
- 6.3.8. Attachments (Illustrations).

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

- 6.4.1. Local Area Procedures.
- 6.4.2. Controlled Emergency Landing Areas/Procedures.
- 6.4.3. Local Weather Procedures.
- 6.4.4. Approved Alternate Missions.
- 6.4.5. Unit Standards.

6.5. Forms Adopted. The following Air Force forms are adopted for use in this instruction: AF Form 847, **Recommendation for Change of Publication**; and AF Form 70, **Pilot's Flight Plan and Flight Log**.

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

AFPD 11-2, *Aircraft Rules and Procedures*

AFPD 11-4, *Aviation Service*

AFI 11-202V3, *General Flight Rules*

AFI 11-2RQ-1V1, *RQ-1--Crew Training*

AFI 33-360V1, *Publications Management Program*

AFI 37-160V8, *Air Force Forms Management Program*

Federal Aviation Administration Order 7610.4, *Special Military Operations*

T.O. 1Q-1(R)B-1, *USAF Series RQ-1B System Flight Manual*

Abbreviations and Acronyms

ACC—Air Combat Command

AF—Air Force

AGL—above ground level

AIF—Aircrew Information File

CSAR—Combat Search and Rescue

DEMPC—Data Exploitation, Mission Planning, and Communication

DO—Director of Air and Space Operations or Operations Officer

EI—essential elements of information

EO—electro-optical

EP—emergency procedure

ETA—estimated time of arrival

FCIF—Flight Crew Information File

FLIP—Flight Information Publication

FPM—feet per minute

GCS—ground control station

GPS—Global Positioning System

HQ—headquarters

IAW—in accordance with

IFF—identification friend or foe

INS—inertial navigation system

IP—instructor pilot

IQT—Initial Qualification Training

IR—infrared

ISO—instructor sensor operator

KGS—knots ground speed

MAJCOM—major command

mm—millimeter

MQT—Mission Qualification Training

MSA—minimum safe altitude

MUX—multiplexer

NM—nautical mile

NOTAM—Notice to Airmen

OGV—office symbol for Operations Group Standardization and Evaluation

OPR—office of primary responsibility

ORF—Operational Read File

OSC—on-scene commander

PIC—Pilot in Command

PSO—Pilot/Sensor Operator

RCC—Rescue Coordination Center

RCR—runway condition reading

ROS—relief on station

ROZ—restricted operations zone

RPM—revolutions per minute

SAR—synthetic aperture radar

SO—sensor operator

SQ/DO—Squadron Operations Officer

TEMPO—temporary, term used in weather forecasts

TESAR—Tactical Endurance Synthetic Aperture Radar

TV—television

USAF—United States Air Force

VCR—video cassette recorder

Terms

Critical Phases of Flight—Takeoff, approach, and landing are critical phases of flight.

Minimum Crew—Minimum GCS crew to operate the RQ-1 is a pilot in the left seat and a pilot or SO in the right seat.

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

Primary Crew—The pilot in the left seat is the primary crew and is responsible for the safe ground and flight operations of the RQ-1 aircraft.

Relief on Station—A flight procedure where from a single GCS a second RQ-1 aircraft is launched to relieve an RQ-1 aircraft that is already on station. After the second aircraft is on station in the mission area, the relieved aircraft is returned to and landed at home station.

RQ-1 Crew—The RQ-1 crew normally consists of the pilot, the SO and one or both of the following crew positions filled by an SO: DEMPC and SAR. GCS crew complement will vary with mission phase (e.g. ground operations, en-route navigation, target acquisition, etc.) and target collection requirements. Typical RQ-1 crew manning is a pilot, an SO, and a DEMPC operator. The SAR position is normally filled by moving the SO or the DEMPC operator to the SAR station. The SO, DEMPC and SAR crewmembers are responsible for target acquisition, target list management, mission plan management and revision, image capture, image annotation, and mission reporting.

Sensor Ball—The Sensor Ball is a gimballed ball that houses the EO and IR sensor payloads.

EO—The EO payload has two components: a variable-zoom (the Day Television [TV]) sensor and the spotter sensor. The Day TV sensor has a variable focal length of 16mm to 160mm while the spotter sensor has a 955mm fixed focal length capable of National Imagery Interpretability Rating Scale level 6 imagery from 5 to 6 NMs.

IR—The IR payload is either the PtSi or the InSb sensor. The IR payload sensor has three fixed focal lengths of 19mm, 70mm, and 280mm for the PtSi or 11mm, 70mm, and 280mm for the InSb. The IR sensor also has a doubler lens that when engaged doubles the focal length of the three lenses. It records emitted heat energy in the mid-infrared range and produces monochrome imagery that renders warm or hot features light gray to white and cool or cold features dark gray to black (reversible to hot-black, cold-white).

TESAR—The TESAR sensor is a synthetic aperture radar that images a 600-1100 meter wide ground swath while the RQ-1 stands off approximately 4.4 to 10.8 kilometers. The TESAR sensor requires a Ku-band satellite communications link for operation.

Attachment 2**MISSION BRIEFING GUIDE**

A2.1. Mission Briefing Guide. The following checklist is a guide for accomplishing mission briefing:

1. Mission Overview:
 - a. Roll Call:
 - b. Time Hack:
 - c. Security Classification:
 - d. Pilot in Command:
 - e. Call Sign:
 - f. Takeoff:
 - g. Land:
 - h. Mission/Training Objectives:
2. Maintenance Information:
 - a. Tail #:
 - b. Configuration:
 - c. Aircraft Status:
 - d. Spare:
 - e. Fuel Load:
 - (1) Front:
 - (2) Aft:
 - f. Ramp Weight:
3. Weather:
 - a. Surface Winds:
 - b. Ceiling and Visibility:
 - c. Hazards:
4. Airfield/Airspace:
 - a. Airfield/Airspace NOTAMs:
 - b. Airfield Restrictions:
 - c. Takeoff and Landing Data:
 - d. Enroute Airspace:
 - e. Airspace Coordination:
 - f. Range/Restricted Operations Zone (ROZ):

- (1) Time:
- (2) Altitude:
- (3) MSA:
- (4) Bingo Fuel (IFR/VFR):
5. Intelligence:
 - a. General Target Information:
 - b. General Situation:
 - c. Threat Analysis:
 - d. Reporting Requirements:
6. Targets/Tactics:
 - a. Target/Waypoint #:
 - b. Target Coordinates:
 - c. Target Descriptions:
 - d. EEI:
 - e. Threat Countertactics:
 - f. Sensor Plan/Tactics:
 - (1) Environmentals (sun angle, thermal cross-over, smoke, haze, fog, other obscurations, etc.)
 - (2) Sensors to be used.
 - (3) Target priorities and prosecution order.
 - (4) Aircraft positioning plan for best image.
7. Crew Coordination:
8. Training:
 - a. Name:
 - b. Ride #:
 - c. Time:
 - d. Requirements:
9. Alternate Mission:
10. Read Files:
 - a. FCIF #:
 - b. AIF #:
 - c. ORF #:
11. Collision Avoidance:

- a. Visual Search Responsibilities:
 - (1) Departure/enroute/recovery.
 - (2) High-density traffic areas.
 - b. Mid-air Collision Avoidance:
 - (1) From other military aircraft.
 - (2) From civilian aircraft.
12. Special Interest Items (SIIs):
- a. AF:
 - b. MAJCOM:
 - c. Wing:
 - d. Squadron:
 - e. OGV Trends:
 - f. EP of the Day:
13. Safety:
14. Mission Timing:
- a. GCS Show Time:
 - b. Engine Start:
 - c. Changeover:
14. Commander's Comments:

Attachment 3**PILOT CHANGEOVER BRIEFING GUIDE**

A3.1. Pilot Changeover Briefing Guide. The following checklist is a guide for accomplishing pilot changeover:

1. Mission Update.
2. Current Clearance.
 - a. Airspace.
 - b. Altimeter Setting.
 - c. Altitude Block.
 - d. Time Remaining.
 - e. High Terrain.
 - f. Divert Field.
 - g. Identification Friend or Foe (IFF)/Mode IV Settings.
3. Emergency Mission Information (Include each waypoint altitude for missions with more than six waypoints).
4. Initial Lost Link Heading and Altitude.
5. Current Multiplexer (MUX).
6. Data Link Configuration.
 - a. Status of transmitters.
 - b. Datalink trend information.
7. Fuel Status.
8. Weather Update.
 - a. Enroute.
 - b. Recovery airfield.
9. Position of other aircraft in vicinity.
10. System Operation.
11. Video Cassette Recorder (VCR) Tapes.
12. Complete Paperwork:
 - a. Log Flight Time.
 - b. Log Training Events.
 - c. Log Aircraft/GCS Write-ups and Brief the New Pilot.

Attachment 4**SO CHANGEOVER BRIEFING GUIDE**

A4.1. SO Changeover Briefing Guide. The following checklist is a guide for accomplishing SO changeover:

1. Mission Update.
2. Current Clearance.
 - a. Airspace.
 - b. Altitude Block.
 - c. Time Remaining.
 - d. High Terrain.
3. Current MUX.
4. Data Link Configuration.
5. Weather Update.
6. VCR Tapes.
7. Status of Sensors.
8. Current Target or Next Target Status.
9. Complete Paperwork:
 - a. Log Flight Time.
 - b. Log Training Events.
 - c. Log Aircraft/GCS Write-ups and Brief the New SO.

Attachment 5**DEMPC CHANGEOVER BRIEFING GUIDE**

A5.1. DEMPC Changeover Briefing Guide. The following checklist is a guide for accomplishing DEMPC changeover:

1. Mission Update.
2. Current Clearance.
 - a. Airspace.
 - b. Altitude Block.
 - c. Time Remaining.
 - d. High Terrain.
 - e. Threat Situation/Avoidance.
 - f. Operational Mission Status.
3. Data Link Configuration.
4. Weather Update.
5. Status of DEMPC.
6. Target deck:
 - a. List of Completed Targets.
 - b. List of Targets to Complete.
 - c. List of Ad Hoc Targets.
7. Complete Paperwork:
 - a. Log Flight Time.
 - b. Log Training Events.
 - c. Log Aircraft/GCS Write-ups and Brief the New DEMPC.

Attachment 6**MISSION DEBRIEFING GUIDE**

A6.1. Mission Debriefing Guide. The following checklist is a guide for accomplishing mission debriefing:

1. Ground Procedures.
2. Takeoff/Departure.
3. Enroute Procedures.
4. Recovery/Landing/After Landing.
5. General:
 - a. SIIIs.
 - b. Radio Procedures.
 - c. Crew Discipline/Effectiveness.
6. Mission Accomplishment/Analysis:
 - a. Mission Reconstruction.
 - b. Mission Support.
 - c. 8mm Tape/Mission Imagery Assessment.
 - d. Learning Objectives Achieved.
 - e. Lessons Learned.
 - f. Recommendations for Improvement.
7. Comments/Questions.

Attachment 7**FENCE CHECKS**

A7.1. Fence Checks. The following checklists are guides for accomplishing fence checks:

A7.1.1. Inbound:

1. Aircraft.
 - a. Climb/Level Off Checks - Complete.
 - b. Airspace/Aircraft/Altitude - Deconflict and Check.
 - c. Alternate Landing Sites - Selected and Reviewed.
 - d. Fuel Level - Checked.
 - e. Bingo Fuel - Calculated.
 - f. Weather Check - Accomplished.
 - g. Navigation/Strobe Lights - As Required.
 - h. Transponder - As Required.
 - i. Proper Altitude - Established/Altimeter Set.
 - j. Lost Link Emergency Mission - Checked.
 - k. Weather/Freezing Level.
 - l. MUX.
 - m. Timeline for Operation Execution.
2. Communications.
 - a. Radios - Check in with Controlling Agency.
 - b. Intercom - set as required
3. Threats.
4. Ku/SAR Power Up Checks - Complete (if required).
 - a. KU, VQ, or Enerdyne - Verified.
 - b. SAR Ops Check - Complete.
5. Sensor Checks.
 - a. DTV and Spotter - Checked.
 - b. IR - Checked and Calibrated Double/Non-Doubler.

A7.1.2. Outbound:

1. Aircraft.
 - a. Battle Damage - Check.
 - b. Systems - Check.

- c. Lost Link Emergency Mission - Checked.
 - d. Weather sweep - Accomplish.
2. Emitters.
- a. Nav lights - As Required.
 - b. Strobe lights - As Required.
 - c. Transponder - As Required.
 - d. KU Power Down Checklist- As Required.
 - e. MUX
3. Communications.
- a. Radios - Checked.
 - b. Controlling Agency - Establish Contact IAW Special Instructions (SPINS).
 - c. Airspace/Aircraft/Altitude - Deconflict.
4. Sensors.
- a. DTV/Spotter - Checked.
 - b. IR - Checked and Calibrated.
 - c. SAR Power Down Checklist - As Required.

Attachment 8**COMBAT SEARCH AND RESCUE/ON-SCENE COMMANDER CHECKLIST**

A8.1. Combat Search And Rescue/On-Scene Commander Checklist. The following checklist is a guide for RQ-1 (C)SAR employment. The checklist is not all-inclusive and not all items apply in every situation. RQ-1 capabilities are not widely known; therefore, be flexible. Time is critical. Successful recovery is less likely the longer it takes to get recovery forces to the survivor. The RQ-1 Operations Cell should establish communication with the appropriate Rescue Coordination Center (RCC) and the SAR Mission Coordinator. The most difficult and time-consuming (C)SAR phase is survivor Positive Location and Identification and communicating that location and identification to the recovery Launch Authority.

1. Aviate:

a. Establish safe course or loiter pattern.

(1) Altitude.

(2) Airspeed.

(3) Heading.

b. Avoid threats.

c. Avoid parachute(s).

2. Stack:

a. Direct all aircraft to an altitude above the last known parachute altitude.

b. Deconflict assisting aircraft by altitude, non-essential aircraft return to base.

3. Squawk (peace time):

a. If on-scene when a survivor situation develops, set IFF to emergency 7700 alerting Air Traffic Control/controlling agency of distress situation.

b. Have Operations Cell call Command and Control agencies (Air Operations Center, RCC, etc.).

4. Communicate:

a. Monitor Guard for initial contact with survivor.

b. Establish radio contact with controlling agencies.

c. When contact is established with survivor - push 282.8 if able.

d. Relay critical information as required and brief assisting aircraft as necessary.

5. Mark/Identify:

a. Location of survivor and/or crash site with geographic references, coordinates, radial/DME, or SARDOT.

b. Hostile environment/enemy activity:

(1) Unfriendly persons/enemy activity.

(2) Terrain considerations for recovery.

- (3) Weather considerations.
- (4) Necessary standoff to avoid highlighting survivor position.
- c. Authenticate (may be difficult due to communication limitations):
 - (1) Check SPINS.
 - (2) ISOPREP.
- 6. Assess Aircraft:
 - a. Establish bingo fuel.
 - b. Video feed to C2 element - status
 - c. Sensor status.
 - d. SAR - as required.
- 7. Direct (if able direct elements participating to affect recovery):
 - a. Rescort and/or recovery vehicles to survivor.
 - b. Survivor to:
 - (1) Signal.
 - (2) Move to better position.
- 8. Handoff:
 - a. Brief Airborne Mission Commander, new OSC or "SANDY" if being relieved.
 - b. Maintain video feed to AOC if able.
 - c. SAR survivor area.