

## CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Air National Guard – 174<sup>th</sup> Fighter Wing

6001 W. Molloy Rd.  
Syracuse, NY 13211

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Operation of the MQ-9 Reaper Unmanned Aircraft System (UAS) in Wheeler Sack Army Airfield (AAF) (Fort Drum) Class D airspace under the jurisdiction of Wheeler Sack AAF ATCT (KGTB) and Class A airspace under the jurisdiction of Boston and Cleveland Air Route Traffic Control Centers (ARTCC), including the transitions between KGTB Class D airspace and R-5201 and the transition between R-5201 & R-5202A/B to the NAS and the Misty Air Traffic Control Assigned Airspace (ATCAA) areas. See Attachment 1.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

### STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

### SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2010-ESA-33 is effective from October 15, 2011 to October 14, 2012, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

FAA Headquarters, AJV-13

(Region)

October 14, 2011

(Date)



Dean E. Fulmer

(Signature)

Acting Manager, Unmanned Aircraft Systems

(Title)

**ATTACHMENT to FAA FORM 7711-1**

**Issued To:** Air National Guard – 174<sup>th</sup> Fighter Wing (FW)

**Address:** 6001 E. Molloy Rd.  
Syracuse, NY 13211

**Activity:** Operation of the MQ-9 Reaper Unmanned Aircraft System (UAS) in Wheeler Sack Army Airfield (AAF) (Fort Drum) Class D airspace under the jurisdiction of Wheeler Sack AAF ATCT (KGTB) and Class A airspace under the jurisdiction of Boston and Cleveland Air Route Traffic Control Centers (ARTCC), including the transitions between KGTB Class D airspace and R-5201 and the transition between R-5201 & R-5202A/B to the NAS and the Misty Air Traffic Control Assigned Airspace (ATCAA) areas. See Attachment 1.

**Purpose:** To prescribe UAS operating requirements (outside of restricted and/or warning area airspace) in the National Airspace System (NAS) for the purpose of training and/or operational flights.

**Dates of Use:** This Certificate of Authorization (COA) 2010-ESA-33 is valid from October 15, 2011 through October 14, 2012. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 days prior to the requested effective date.

**General Provisions:**

- The review of this activity is based on our current understanding of UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

**Safety Provisions:**

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, General Operating and Flight Rules, Subpart J-Waivers, 91.903, Policy and Procedures, the following provisions provide acceptable mitigation of 14 CFR Part 91.111/113 and must be complied with:

- For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, restricted areas, and warning areas. The observers may either be ground based or in a chase plane. If the chase aircraft is operating more than 100ft above/below and or ½ nm laterally, of the UA, the chase aircraft PIC will advise the controlling ATC facility.
- In order to comply with the see and avoid requirements of Title 14 of the Code of Federal Regulations sections 91.111 and 91.113, the pilot-in-command and visual observers must be able to see the aircraft and the surrounding airspace throughout the entire flight; and be able to determine the aircraft's altitude, flight path and proximity to traffic and other hazards (terrain, weather, structures) sufficiently to exercise effective control of the aircraft to give right-of-way to other aircraft, and to prevent the aircraft from creating a collision hazard.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Cloud clearances and VFR visibilities for Class E airspace will be used regardless of class of airspace. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
- The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of this COA.

#### **Airworthiness Certification Provisions:**

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft must contain one of the following:
  - A civil airworthiness certification from the FAA, or
  - A statement specifying that the Department of Defense Handbook "Airworthiness Certification Criteria" (MIL-HDBK-516), as amended, was used to certify the aircraft or
  - Equivalent method of certification.

#### **Pilot / Observer Provisions:**

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UA will operate. Pilots must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.
- Aircraft and Operations Requirements:
  - Flight Below 18,000 Feet Mean Sea Level (MSL).
    - UA operations below 18,000 feet MSL in any airspace generally accessible to aircraft flying in accordance with visual flight rules (VFR) require visual

- observers, either airborne or ground-based. Use of ATC radar alone does not constitute sufficient collision risk mitigation in airspace where uncooperative airborne operations may be conducted.
- Flights At or Above 18,000 Feet Mean Sea Level (MSL)
    - When operating on an instrument ATC clearance, the UA pilot-in-command must ensure the following:
      1. An ATC clearance has been filed, obtained and followed.
      2. Positional information shall be provided in reference to established NAS fixes, NAVAIDS, and waypoints. Use of Latitude/Longitude is not authorized for flight plan processing unless prior approval is obtained from Boston and/or Cleveland ARTCC, as appropriate.
  - **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR 91.111, *Operating Near Other Aircraft*, 14 CFR 91.113, *Right-of-Way Rules*, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. Observers must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.
  - **Pilot-in-Command (PIC) –**
    - **Visual Flight Rules (VFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC operating a UA in line of sight must pass at a minimum the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105, and must keep their aeronautical knowledge up to date.
      - There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.
      - Pilots flying a UA on other than instrument flight plans beyond line of sight of the PIC must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR 61.105.
    - **Instrument Flight Rules (IFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC must be a certified pilot (minimum of private pilot) of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
      - The PIC must also have a current/appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.
  - **Pilot Proficiency – VFR/IFR as applicable:**

- Pilots will not act as a VFR/ IFR PIC unless they have had three qualified proficiency events within the preceding 90 days.
  - The term “qualified proficiency event” is a UAS-specific term necessary due to the diversity of UAS types and control systems.
  - A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots will not act as an IFR PIC unless they have had six instrument qualifying events in the preceding six calendar months (an event that requires the PIC to exercise instrument flight skills unique to the UAS).
- **PIC Responsibilities:**
  - Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR 91.7, Civil Aircraft Airworthiness, or the military equivalent, apply.
  - One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
  - The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, *Careless and Reckless Operation*, apply to UAS pilots.
- **Pilot/Observer Task Limitations:**
  - Pilots and observers must not perform crew duties for more than one UA at a time.
  - Chase aircraft pilots must not concurrently perform either observer or UA pilot duties along with chase pilot duties.
  - Pilots are not allowed to perform concurrent duties both as pilot and observer.
  - Observers are not allowed to perform concurrent duties both as pilot and observer.

**Standard Provisions:** These provisions are applicable to all operations unless indicated otherwise in the Special Provisions section.

- The UA PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions, unless specified otherwise in the Special Provisions section. The PIC shall comply with all ATC instructions and/or clearances.
- If equipped, the UA shall operate with an operational mode 3/A transponder, with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk.
- If equipped, the UA shall operate with position/navigation and anti-collision lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation, sequencing, or a visual approach.

- VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in, except when operating in Class A airspace where 14 CFR Part 91.155 will apply.
- Special VFR is not authorized.
- Operations (including lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.
- Operations outside of restricted areas, warning areas, prohibited areas (designated for aviation use) and/or Class A airspace may only be conducted during daylight hours, unless authorized in the Special Provisions section.
- Operations shall not loiter on Victor airways, Jet Routes, Q Routes, T Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159).
- The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- All operators that use GPS as a sole source must check all NOTAMs and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited without specific approval in the special provisions.
- At no time will TCAS be used in any mode while operating an unmanned aircraft.
- Only one UA will be flown in the operating area unless indicated otherwise in the Special Provisions.
- A copy of this COA will be maintained on site by the PIC or designated representative.
- The Air National Guard – 174<sup>th</sup> Fighter Wing, and/or its representatives, is responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to the UAS.

**Special Provisions:**

1. In the event of a lost link, the UAS pilot will immediately notify Wheeler Sack AAF ATCT, Boston Center, or Cleveland Center, as appropriate, by the most expeditious means possible, state pilot intentions, and comply with the provisions listed below. If radio communications are not possible, backup phone numbers are as follows: The Supervisor on Duty at Wheeler Sack AAF ATCT is 315-772-6606. Boston ARTCC Area A Supervisor's number is 603-879-6656. Cleveland ARTCC Area 3 Supervisor's number is 440-774-0425.
  - Aircraft will comply with the Lost Link procedures depicted in Attachment 2 of this document.
  - If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area – the aircraft will not exit the restricted or warning areas until the link is re-established.
  - The UA lost link mission will not transit or orbit over populated areas.

- When outside of restricted/warning area airspace, lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.
  - Lost link orbit points shall remain within COA assigned airspace and shall not coincide with the centerline of Victor airways, jet Routes, and/or Q Routes.
2. Advanced ATC coordination regarding each daily mission is required. The proponent must submit flight schedule notifications to the following facilities as soon as possible, but no later than 24 hours prior to the commencement of operations.
    - Wheeler Sack AAF ATCT. The Wheeler Sack ATC Chief or Air Traffic and Airspace Manager: 301-772-4480/7999/8711.
    - Boston ARTCC Military Coordinator (ABWMC): 603-879-6663/6666. The ZBWMC will be the focal point for the 174<sup>th</sup> FW's initial coordination regarding all Class A airspace operations, including the advanced coordination with Cleveland ARTCC.
  3. The proponent must submit a flight plan no later than two hours prior to departure.
  4. The proponent must ensure that filing into and requesting flight through SUA/ACTAAs has been coordinated and approved by the Scheduling Agency and are familiar with the appropriate procedures. ATC is not responsible for determining if the UA is authorized to enter SUA/ATCAAs.
  5. The proponent must notify all affected ATC facilities upon cancellation of scheduled operations.
  6. The proponent must comply with all requirements contained in U.S. Army Regulation 95-23 to include local supplements to that regulation.
  7. Launch and recovery of the UA shall only be accomplished while the KGTB ATCT is operating and Class D airspace is active.
  8. All climb and descent transitions to/from Class A airspace shall take place wholly within the KGTB Class D and R-5201/5202.
  9. The Department of the Air Force has determined the airworthiness and safety of the MQ-9 Reaper UAS and submitted a letter stating such dated January 5, 2007. The UA must be operated in strict compliance with all provisions and conditions in this Airworthiness Release. In addition, all normal and emergency procedures as outlined in the COA On-line application must be followed.
  10. Concurrent multiple UAS operations are not authorized.

11. Carriage of live or inert ordnance under this COA is prohibited.
12. The PIC must have at least a Current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61 for any operations in Class D and above 400' AGL in Class G, Class A (and instrument rating per pilot proficiency section).
13. A Pilot-in-Command (PIC) means the person who has final authority and responsibility for the operation and safety of the flight and has been designated as PIC before or during the flight and holds the appropriate category, class and type rating, if appropriate, for the conduct of flight. The PIC must control the aircraft (or override authority to assume control) during all UAS operations.
14. The proponent will ensure that Crew Resource Management (CRM) training has been completed in accordance with the recommended training and procedures contained in FAA Advisory Circular 120-51, Crew Resource Management Training, or in an FAA accepted agency equivalent, based on the application, and is current for all crew members before flying operational or training missions.
15. For all operations, the proponent must develop detailed plans to mitigate the risk of collision with other aircraft and the risk posed to persons and property on the ground in the event the UA encounters a lost link, needs to divert, or the flight needs to be terminated.
16. Flight termination is the intentional and deliberate process of performing controlled flight into terrain. Flight termination shall be executed in the event all contingencies have been exhausted and further flight of the UA cannot be safely achieved or other potential hazards exist that require immediate discontinuation of flight.
17. In the event of a contingency divert or flight termination, the proponent shall operate in Class A airspace and special use airspace the maximum extent possible to reduce the risk of collision with non-participating air traffic.
18. Night operations are authorized provided the following limitations are observed:
  - UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (Note: this is equal to approximately 30 minutes after sunset until 30 minutes before sunrise).
  - UAS ground visual observers must be in place 30 minutes prior to night operations to ensure dark adaption.
  - Ground visual observers will undergo additional training on the lighting configuration of the MQ-9 Reaper UA to ensure proper recognition during night flights.

- UAS launch and recovery operations will take place wholly within Class D airspace while the air traffic control tower is open and Class D airspace is active.
  - The mixing of civil manned and unmanned traffic within Class D airspace during launch and recovery operations is prohibited.
19. A frequency integrity check must be conducted prior to the launch of the UA.
  20. Sterile cockpit procedures must be observed during all critical phases of flight to include all ground operations involving taxi, takeoff, landing, and all other flight operations in which safety or mission accomplishment might be compromised by distractions.
  21. The use of cell phones or other telephonic communication is restricted to the operational control of the UAS, and any required communications with ATC.
  22. ATC must immediately be notified in the event of any emergency, loss and subsequent restoration of command link or any other malfunction or occurrence that would impact air traffic safety or operations.
  23. The FAA has the authority to cancel this COA or delay any activities if the safety of persons or property on the ground or in the air is in jeopardy, or if there is a violation of the terms specified.

**NOTAM:** A distance (D) Notice to Airmen shall be issued when UA operations are being conducted. This requirement may be accomplished through your local base operations or NOTAM issuing authority. You may also complete this requirement by contacting Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of pilot filing NOTAM request
- Location, Altitude or the operating Area
- Time and nature of the activity

**NOTE FOR PROPONENTS FILING THEIR NOTAM WITH DoD ONLY:** This requirement to file with the AFSS is in addition to any local procedures/requirements for filing through DINS. The FAA Unmanned Aircraft Systems Office is working with the AFSS, and to eliminate the requirement to file a NOTAM with both the AFSS and DINS in the near future.

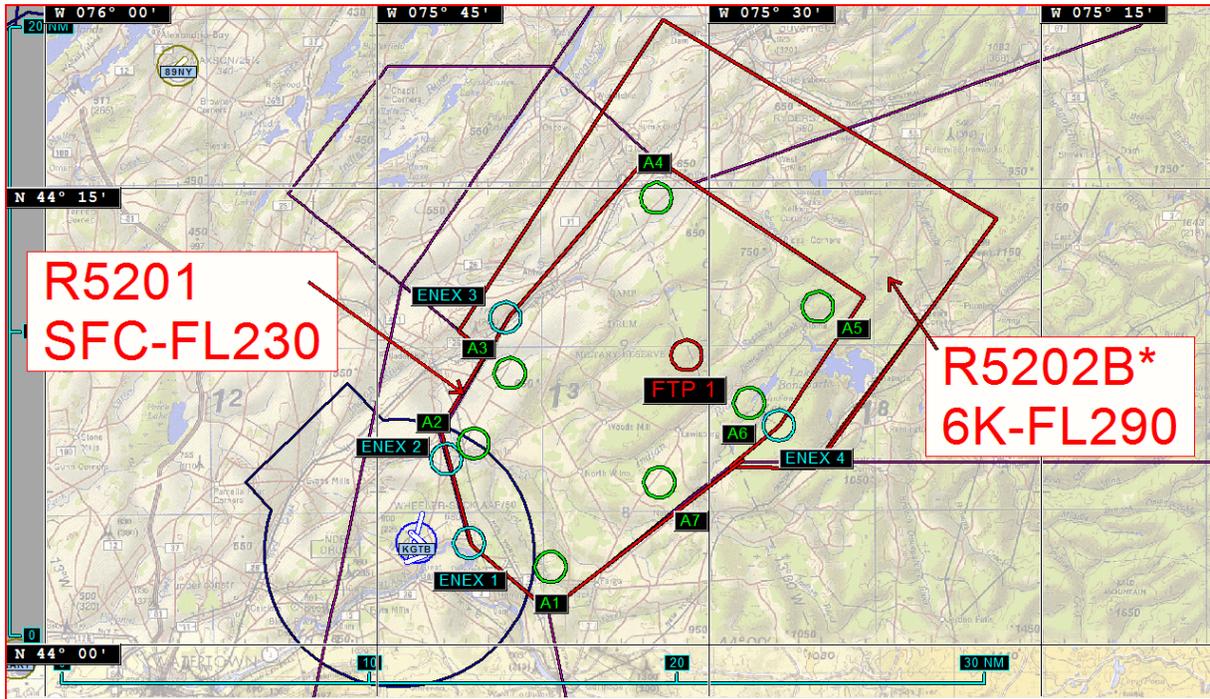
**Incident / Accident and Normal Reporting Provisions:** The following information is required to document routine and unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) on a monthly basis:

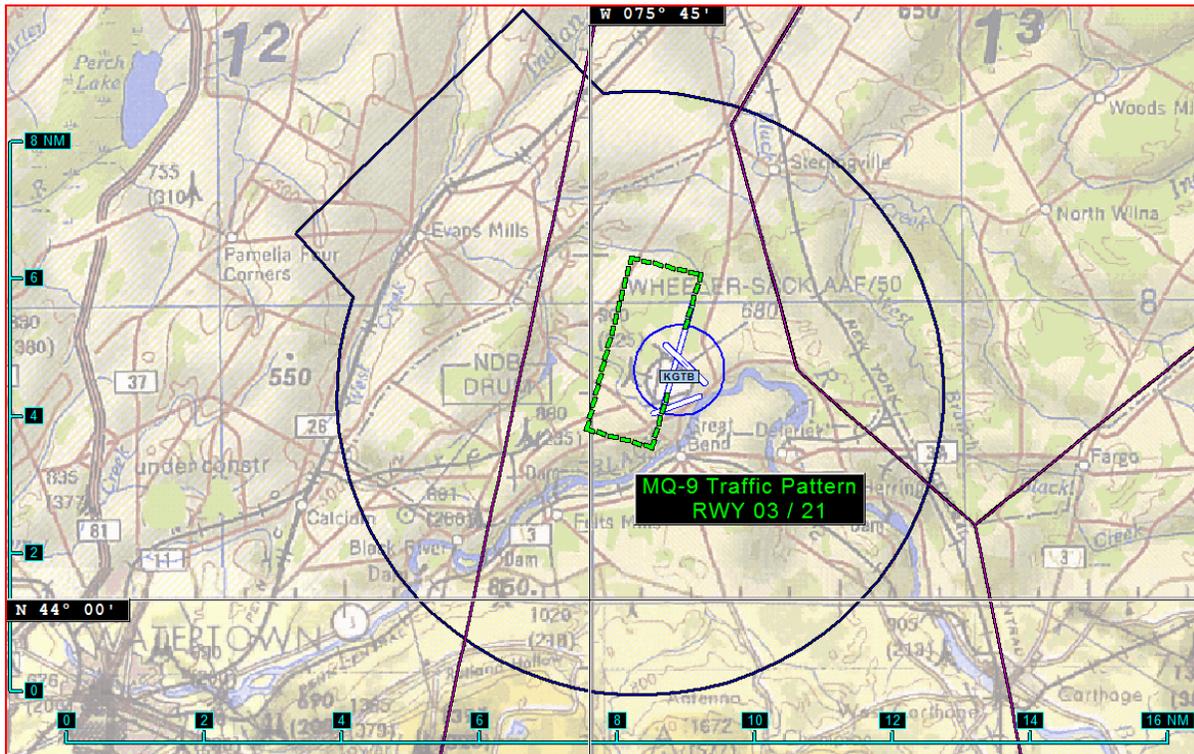
- Number of flights conducted under this COA.
  - Pilot duty time per flight.
  - Unusual equipment malfunctions (hardware/software).
  - Deviations from ATC instructions.
  - Operational/coordination issues.
  - All periods of loss of link (telemetry, command and/or control)
- The following shall be submitted via COA Online, email or phone (202-385-4542, cell 443-569-1732) to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) **within 24 hours and prior to any additional flight under this COA:**
    - All accidents or incidents involving UAS activities, including lost link.
    - Deviations from any provision contained in the COA.

This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Air National Guard – 174<sup>th</sup> Fighter Wing to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The Air National Guard – 174<sup>th</sup> Fighter Wing is hereby authorized to operate the MQ-9 Reaper Unmanned Aircraft System in the operations area depicted in “Activity” above and attachment 1 below.

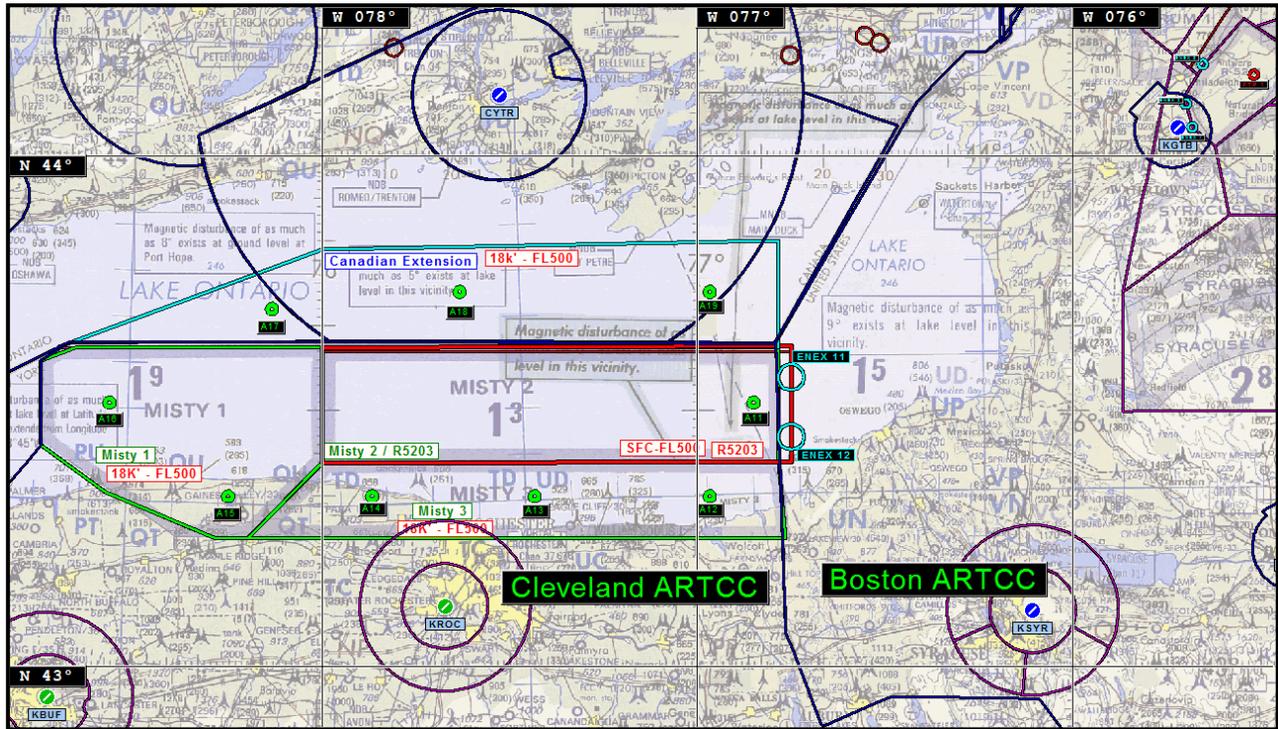
### Restricted Area Operating Areas



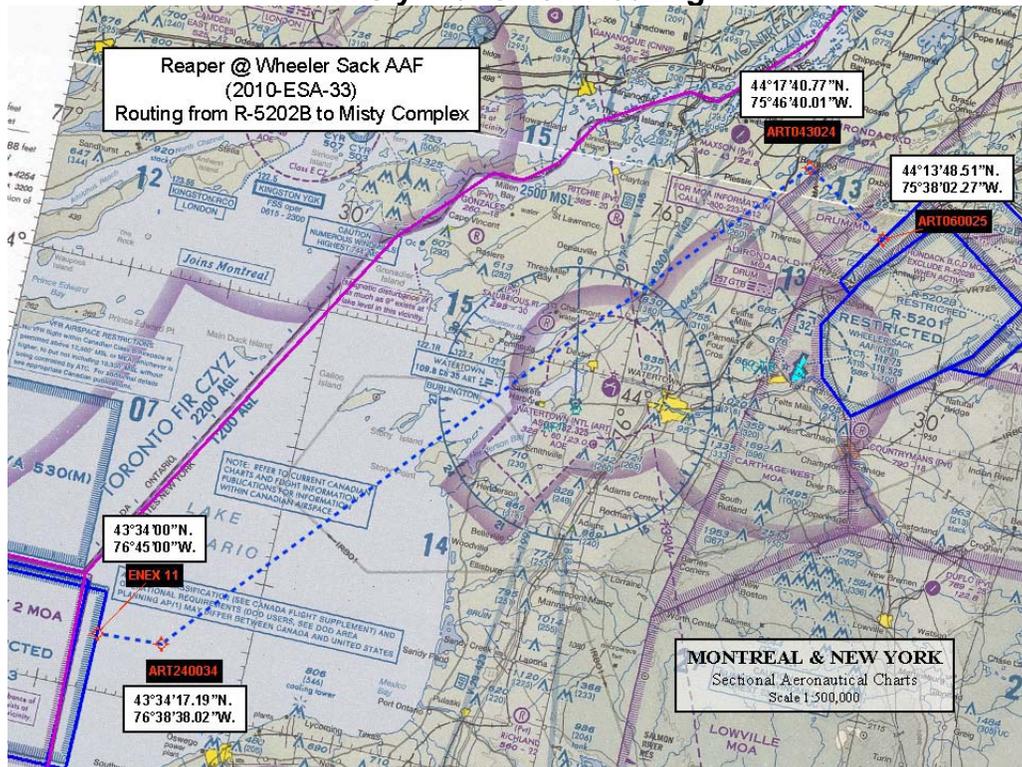
### KGTB Local Operations Pattern



### Misty Airspace Complex



### Misty Transition Routing



## Lost-Link Procedures

- 1) In the event that the RPA enters a Lost-Link status, the RPA will squawk 7600. The RPA Pilot will immediately inform the appropriate ATC controller (via landline telephone) with responsibility for current airspace. This may include Cleveland Air Traffic Control Center (ZOB ARTCC), Boston Air Traffic Control Center (ZBW) as well as WSAAF Radar Approach Control (RAPCON) and/or WSAAF Control Tower directly. The RPA pilot will additionally notify Wheeler Sack Air Traffic Control if recover to R-5201 is anticipated. The Supervisor on Duty at Wheeler Sack AAF ATCT is (315) 772-6006. Boston ARTCC Area A Supervisor's number is (603) 879-6656. Cleveland ARTCC Area 3 Supervisor's number is (440) 774-0425.
- 2) Lost Link within KGTB Class D Airspace :
  - a) If the RPA is operating in the WSAAF traffic pattern, the RPA will depart the Class D and proceed to the Lost Link point within R-5201 at a pre-planned altitude as to not be a conflict with other aircraft or ground operations within R-5201/5202.
- 3) If lost link occurs while operating outside of GTB Class D Airspace the RPA pilot will:
  - a) If within R5201:
    - i) The RPA will maintain the lateral confines of R5201 and proceed direct to initial lost-link waypoint (FTP 1) at FL190 and orbit over FTP#1 while troubleshooting Lost Link.
    - ii) Flight Termination Point No. 1 (FTP #1) is defined as the point overhead the Main Impact Area of the 'North Box' at location N 44 09.50 W 75 31.0 (ART 076 / 027). The RPA will continue to trouble-shoot Lost-Link in this orbit until normal operations are either re-established, or fuel becomes critical.
    - iii) At 1 hour fuel reserve, advise ATC of 'potential mission termination.' At 30 minutes fuel reserve, advise ATC of "pending termination" and declare an In-Flight Emergency (IFE). Notify Fort Drum Range-Control (via telephone and / or radio transmission) to clear all personnel from any potential impact areas, and put crash-response on alert. Once fuel is exhausted, the UA will lower the landing gear, reduce speed to +15 knots above stall and fly the lost link pattern until ground impact.
    - iv) At termination advise ATC of actual impact location. If, during any expected flight-into-terrain (FIT) the command link is re-established, the UA pilot will attempt to maneuver the aircraft for controlled-flight-into-terrain (CFIT) directly onto the access roads associated with Target No's 405 – 407 IAW the Range 48 Operating Handbook to facilitate recovery.
- 4) If the RPA has departed R5201 and is en-route **either to or from** the Misty Airspace Complex, **but not yet established inside** the Misty Airspace Complex, then:

- a) The RPA will (if eastbound towards R-5201) maintain the current ATC-assigned altitude and course or (if westbound towards the Misty Complex) maintain the current ATC-
  - b) Assigned altitude and proceed to ENEX 11 or 12, then further proceed to A11 and orbit (See Item 5). Once established inside the lateral confines of R5201 the procedures for Lost Link inside of R5201 as previously defined.
- 5) If the RPA has entered the Misty Airspace Complex:
- a) The RPA will proceed direct to initial lost-link waypoint (A11 – defined as the point N 43 31.0 W 076 51.0, or the ROC 068 / 48 DME Fix) at FL190 and orbit over A11 while troubleshooting Link-recovery.
  - b) Once established over A11, the RPA will maintain this orbit and continue to troubleshoot all methods of Link recovery **for a period of 1 hour**; after which the RPA will proceed direct to FTP#1 at FL195 or FL245 and will execute procedures as defined in R5201. The RPA Lost Link altitude will be adjusted as required to ensure positive deconfliction from all other airspace users to the maximum extent and to remain within Class A airspace. If recovery below FL180 is required for any reason (weather, safety of flight, etc.), the PIC will declare an In-Flight-Emergency with the appropriate controlling agency.
  - c) Link recovery will be attempted via Ku or C-Band methods appropriate to the phase of flight and Line-of-Sight (LOS) limitations. The Ft Drum backup GCS (a Dual-Control GCS) will be utilized if required to re-establish the Link. If both Ft Drum GCSs and/or Ft Drum Ground Data Terminal (GDT) are unsuccessful, additional attempts from GDTs either at Syracuse-Hancock Field, or other locations (worldwide) will be attempted prior to termination. Off-station control via Ku recapture shall be considered prior to 'termination' if time and conditions permit.
  - d) FTP #1 – This location is the primary, pre-surveyed impact area for large-order detonations in the Fort Drum bombing and gunnery range. It is the intended termination point for all RPA operations operated by the 174<sup>th</sup> Fighter Wing. While this site is optimized; any location inside of the Designated Impact Area (DIA) located inside of R-5201 is appropriate (see attached diagram). Additionally, the Range Control Officer (RCO) located in the Range Control Tower, will act as an additional spotter and on-scene commander until the Crash-Recovery Operations from Ft. Drum AAF (WSAAF) take control.
- 6) If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area – the aircraft will not exit the restricted or warning areas until the link is re-established.

- 7) The UA lost link mission will not transit or orbit over populated areas.
- 8) When outside of restricted/warning area airspace, lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.
- 9) Lost link orbit points shall not coincide with the centerline of Jet Routes or Victor airways.

