

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

**CERTIFICATE OF WAIVER OR AUTHORIZATION**

ISSUED TO

Miami-Dade Police Department

1567 NW 79 Avenue

Miami, FL 33126

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 MAV-3 Unmanned Aircraft System (UAS) in Class D and G airspace surface to 300 feet Above Ground level (AGL) within a one nautical mile radius contained within 25-59-38.04N/80-53-15.99W, 25-59-38.04N/80-01-49.33W, 25-7-45.88N/80-01-49.33W by 25-7-45.88N/80-53-15.99W under the jurisdiction of the Miami Air Route Traffic Control Center (ARTCC) and Miami Terminal Radar Approach Control (TRACON) Facility identified in attachment 1. See special provisions.

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 of Authorization (COA) 2011-ESA-4 is valid from July 1, 2011 through June 30, 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)

*Dean E. Fulmer*

Dean E. Fulmer

(Signature)

June 7, 2011

(Date)

Acting Manager, Unmanned Aircraft Systems

(Title)

**ATTACHMENT to FAA FORM 7711-1**

**Issued To:** Miami-Dade Police Department

**Address:** 1567 NW 79 Avenue  
Miami, FL 33126

**Activity:** Operation of the MAV-3 Unmanned Aircraft System (UAS) in Class D and G airspace surface to 300 feet Above Ground level (AGL) within a one nautical mile radius contained within 25-59-38.04N/80-53-15.99W, 25-59-38.04N/80-01-49.33W, 25-7-45.88N/80-01-49.33W by 25-7-45.88N/80-53-15.99W under the jurisdiction of the Miami Air Route Traffic Control Center (ARTCC) and Miami Terminal Radar Approach Control (TRACON) Facility identified in 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 2011-ESA-4-COA is valid from July 1, 2011 through June 30, 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 91.113 and 91.111, 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.
- **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 lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.

- 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, 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 NOTAM's 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 Miami-Dade Police Department 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 PIC will immediately notify Miami TRACON at (305) 869-5477 or the Air Traffic Control Facility having jurisdiction over the operating area, state pilot intentions, and comply with the following provisions:
  - In the event of a lost link, the UAS will automatically climb to or maintain 300 feet AGL and proceed to the Rally Point which is also the Launch/Recovery point. The lost link timer will be set at 15 seconds and in the event of lost link the UA will fly to the rally point. If the UA does not re-establish a link, the aircraft will automatically land when it reaches the Rally Point. If the Fuel warning occurs while executing the lost link procedure, UAS will land at its current location.
  - If lost link or an emergency situation occurs that causes the MAV UA to depart the defined incident perimeter/operations area, the PIC must immediately notify MIAMI TRACON or the Air Traffic Control Facility having jurisdiction over the operating area via phone or on the appropriate Air traffic Control Frequency.

- 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.
  - 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 not coincide with the centerline of Victor airways.
2. The Miami-Dade Police Department Aviation Unit Commander has determined the Airworthiness and safety of the Honeywell MAV UA and submitted a certification letter dated July 25, 2008. The MAV must be operated in strict compliance with all manufacturers' specifications and recommendations as well as with all of the provisions and conditions contained in the most current Airworthiness Release, including all appendices.
  3. The MDPD has certified this UA is a public aircraft under Section 40102 (a) (37), Title 49 United States Code, and certifies 2011-ESA-4 is inherently a governmental function intimately related to the interest and safety of the public.
  4. A copy of the COA including the special limitations must be available at the defined incident scene/operations area for MAV UA operations.
  5. The pilot-in-command (PIC) must notify MIAMI terminal radar approach control (TRACON) at (305) 869-5477 or the air traffic control (ATC) facility having jurisdiction over the operating area , no later than thirty (30) minutes prior to the operation and advise of the following:
    - Location of the Mission Site (Latitude and Longitudinal Coordinates).
    - The Notice to Airman (NOTAM) number.
    - The planned time for commencing UA operations.
    - A point of contact name and phone number who will be available for the duration of the operation the time for commencing operations.
    - A request for the non-transponder authorization for operations within the Miami TRACON (MIA) Title 14 of the Code of Federal Regulations (14 CFR) Part 91 Appendix D (Mode C Veil) if operation is within 30 NM Mode C veil.
    - Additionally, the Proponent with notify the Miami TRACON or ATC facility having jurisdiction over the operating area upon the conclusion of operations.
  6. The Miami TRACON or ATC facility having jurisdiction over the operating area may terminate or delay the provisions of this COA at any time it deems a sufficient level of safety for operations is not met.
  7. The holder of this COA, or delegated representative, is responsible for halting or cancelling activity in the operations area if, at any time, the safety of persons or

- property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this waiver.
8. A PIC must be designated prior to launch of the MAV UA and must be at the controls of the UA during all phases of flight.
  9. The PIC must conduct a thorough pre-mission briefing prior to commencing any MAV UA flight operations. At a minimum, the briefing must include a review of the defined and controlled incident perimeter, the Safety hazards/risks within the defined incident perimeter/area of operations, specific objective(s) of the mission, and a pre-takeoff briefing. The pre-takeoff briefing shall include the contents of this COA, expected duration of the mission, operating limitations/restrictions, specific communications requirements with ATC including a lost communications procedure, emergency procedures, the altitudes to be flown, initial heading, frequencies to be used, lost link procedures, the parameters for the use of a Final Termination Point (FTP), communication, and the amount of fuel reserve for the UA.
  10. The PIC is responsible for and must take the appropriate actions to ensure that the MAV UA remains in the defined secure incident perimeter within the operating area.
  11. "Daisy chaining" of visual observers is prohibited.
  12. All crewmembers including the PIC and visual observers must receive training from a qualified instructor who has, at all times, operational control of the UA.
  13. Unmanned aircraft system (UAS) operations, within the area of jurisdiction, must remain within a defined incident perimeter controlled by law enforcement at or below 300 feet above ground level (AGL). MDPD and supporting law enforcement agency (LEA) will discover and manage all ground hazards within the defined incident perimeter most especially concerning people and private property.
  14. MAV UA Operations must be conducted within visual line of sight from the position(s) of the PIC and Observer(s) at all times. The PIC and all Observers must maintain sufficient visual contact with the MAV UA in order to determine its attitude, altitude, and direction of flight and ensure that the MAV UA remains within the defined incident perimeter.
  15. Night Operations are prohibited.
  16. The MAV UA operations are prohibited within the incorporated city limits of Miami, near, around or over any high-rise buildings, or populated beach line areas and will not over-fly outdoor assemblies of people or heavily trafficked roadways.

17. Pursuit missions outside the secured, defined incident perimeter are prohibited.
18. MAV UA operations must be offset as needed to ensure the orbit or flight path of the UA does not incur a risk of injury to persons or property along its flight path. A mitigation strategy may include but is not limited to evacuation of persons from within the incident perimeter by legal authority.
19. MAV UA operations are prohibited within Class B airspace.
20. MAV UA flight operations are prohibited when other manned aircraft are operating within the incident perimeter.
21. Sterile cockpit procedures must be observed by all MAV team members during critical phases of flight.
22. PIC is responsible at all times for collision avoidance with other manned aircraft and the safety of all operations. In the event of a potential conflict with a manned aircraft, the UA will immediately terminate the flight and land to ensure safety.
23. A frequency integrity check must be conducted prior to launch of the MAV UA.
24. The PIC will coordinate as necessary, and must monitor the appropriate universal communications (UNICOM) frequency when flying within five nautical miles of any non-towered airports, helipads or water landing areas.
25. The PIC will continuously monitor the VHF Frequency 123.025 (a common, low-level air-to-air flight coordination frequency) and broadcast UAS operations prior to takeoff and during all operations.
26. During MAV UA operations, the use of cell phones or other telephonic communication is restricted to the operational control of the MAV UA, and any required communications with ATC.
27. The Miami TRACON or ATC facility having jurisdiction over the operating area must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, loss and subsequent restoration of PIC and observer visual contact, or any other malfunction or occurrence that would impact air traffic safety or operations.
28. Operation within the CFR 91 Appendix D airspace may be approved without a transponder, with the approval of ATC, based on the Independent flight termination feature on this Honeywell MAV UA.
29. Notice to Airmen (NOTAM) Requirement. A distance (D) Notice to Airmen shall be issued 48 to 72 hours prior to normal unmanned aircraft operations being

conducted. Due to the immediacy of some tactical operations, it is understood by the Federal Aviation Administration that this NOTAM notification may be reduced to no less than one hour prior to these operations with the requirement that the proponent place a notice in the Airport Facility Directory (AFD), advising the possibility of Unmanned Aircraft Operations in the Operational Area during the period of time this COA is valid.

30. Special provisions 1, 5, 6, 24, 25, 27 and 28 will be used in lieu of maintaining direct two-way Communications with ATC (Standard Provisions, bullet one).

**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 1 hour prior (provided the AFD information is published) to the operation and provide:

- Name, Address, and Contact data of activity conducting UAS operations
- Location, Altitude of the specific operating area (defined incident perimeter)
- Name of Pilot filing the NOTAM request
- Time and nature of the UAS 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 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 email, COA online or phone (202-385-4542, cell 443-569-1732) to 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 Miami-Dade Police Department to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The Miami-Dade Police Department is hereby authorized to operate the Honeywell MAV-3 Unmanned Aircraft System UAS in the operations area depicted in "Activity" above and attachment 1 below.

Attachment 1



