

## CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

United States Marine Corps

ADDRESS

USMC - VMU-2  
Commanding Officer, VMU-2  
PSC Box 8077  
MCAS Cherry Point, North Carolina 28533

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 Shadow UAS in Class D and E airspace from Cherry Point Marine Corps Air Station directly to R5306A/C under the jurisdiction of Cherry Point Air Traffic Control Tower and Cherry Point Approach Control. All UAS operations will occur between 2500 feet and 3500 feet Mean Sea Level (MSL). 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 (2007-AHQ-51) is effective from February 1, 2008 to March 31, 2008, 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, AJR-36  
(Region)

Ardyth Williams  
(Signature)

January 25, 2008  
(Date)

Air Traffic Manager, Unmanned Aircraft Systems  
(Title)

**ATTACHMENT to FAA FORM 7711-1**

**ISSUED TO:** United States Marine Corps

**ADDRESS:** USMC- VMU-2  
Commanding Officer, VMU-2  
PSC Box 8077  
MCAS Cherry Point  
North Carolina 28533

**NAME:** Federal Aviation Administration (FAA) Certificate of Authorization (COA) for Shadow Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) outside of restricted/warning area airspace.

**ACTIVITY:** Operation of the Shadow UAS in Class D and E airspace from Cherry Point Marine Corps Air Station directly to R5306A/C (see Attachment 1) under the jurisdiction of Cherry Point Air Traffic Control Tower and Cherry Point Approach Control. All UAS operations will occur between 2500 feet and 3500 feet Mean Sea Level (MSL) in the area depicted in attachment 1.

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

**DATES OF USE:** This COA is valid from February 1, 2008, through March 31, 2008. The FAA will not consider an extension or a request for duplicate approval at other locations in the country. If the Marine Corps cannot complete the training within the time limit specified in this COA, then all subsequent operations will originate and terminate at either Bogue Field or within the restricted areas.

**GENERAL PROVISIONS:**

- The review of this activity is based on our current understanding of the 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 special provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

Because of the assigned National Defense requirement to deploy VMU-2 on April 2, 2008, the FAA may approve an application for a COA that, under normal circumstances, does not otherwise conform to the FAA's UAS operational guidelines. The Commanding Officer, VMU-2 Marine Aircraft Wing, has

accepted responsibility for all risk. Additionally, Lieutenant General George J. Trautman III, the Deputy Commandant for Aviation, Headquarters, United States Marine Corps, endorsed the Marines' acceptance of all risk associated with this operation, including, risks associated with mid-air collision between the UAS and all other military and civil aircraft in the area. FAA will not impose flight restrictions to manned aircraft operations in the same area.

### **SAFETY PROVISIONS:**

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted/warning/Class A airspace 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 91.113 and must be complied with:

- Visual Observers, either ground-based or airborne, must be used when operating in the Cherry Point Class D airspace.
- The applicant and/or its representatives are responsible for collision avoidance with all aircraft, other aviation operations, and the safety of persons or property on the surface.

### **AIRWORTHINESS CERTIFICATION PROVISIONS:**

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft applications 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 UAS will operate. Pilots must have in their possession a current third 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.
- **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*, and 14 CFR 91.113, *Right-of-Way Rules*. Observers must have in their possession a current third 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):**

- 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 pass 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.

**Pilot Proficiency – VFR:**

- Pilots will not act as a 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 flying UA on other than instrument flight plans must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105.

**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/ATC Instructions:** The PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions as applicable.

**SPECIAL PROVISIONS:**

The FAA recognizes that, by nature, UAS have no on-board pilot to perform see-and-avoid responsibilities. Therefore, when operating outside of Restricted Airspace, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. Listed below are the special provisions that must be complied with. All personnel connected with this UAS operation shall comply with the contents of this authorization and its special provisions.

1. All UAS operations shall be conducted under Visual Flight Rules (VFR) in Visual Meteorological Conditions (VMC) in accordance with CFR 14 Part 91.
2. For the purpose of see-and-avoid, visual observers must be utilized at all times when operating within the Cherry Point Class D airspace. The visual observer(s) may be either ground based or in a chase aircraft and must remain within 1 mile laterally and/or 3000 feet vertically of the UAS. Pilot/observers must not operate the Shadow at a distance beyond that at which see-and-avoid responsibilities can be exercised.
3. Operations outside of restricted airspace may only be conducted during daylight hours.
4. The UAS transponder and position/navigation/anti-collision strobe lights shall be activated at all times during flight outside of restricted airspace.
5. In the event of a lost link the aircraft will:
  - a. Operations within the Class D: Lost link procedures direct the UAS to fly to the NKT 360 degree radial at 4 DME at an altitude of 2000' and hold. The Mission Commander will immediately contact the tower controller via radio and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
  - b. Operations within the R-5306A: Lost link procedures direct the UAS to fly to the Piney Island military range complex (BT-11) at an altitude of 2000' and hold. BT-11 is located inside R-5306A (NKT 074/24) and is uninhabited except for a small contingent of range controllers and range maintenance personnel. R-5306A airspace extends from the surface to, but not including, FL 180. The Mission Commander will immediately contact Cherry Targets via landline and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
  - c. Operations within the NAS transiting to/from Class D airspace to/from R-5306A/C airspace. If a lost link occurs in the transition area, the UA will continue on its current route until reaching its programmed destination. Once within either the Class D airspace or the R5306A/C airspace, the UA will follow the procedures listed in paragraph 5 a, b, or c above whichever is applicable. The Mission Commander will immediately contact Cherry Point RADAR via radio and

inform them of lost link condition as well as the preprogrammed routing of the aircraft.

- d. In the event that the link cannot be restored with the UAS during the predetermined holding period, the Flight Termination System (FTS) will be activated to allow for a controlled recovery. The FTS is an emergency system comprised of a recovery parachute that can be deployed from either the control station or by the aircraft once a pre-determined set of conditions have been met. Its function is to safely recover the air vehicle with minimum damage to the air vehicle, persons or property during an emergency flight termination.
6. Operations shall not be operated over populated areas, heavily trafficked roads, or an open-air assembly to include lost link procedures.
7. Special VFR operations are not authorized.
8. The USMC is responsible for notifying all Airport Managers and Fixed Base Operators within a 30-NM Radius of Cherry Point of UAS operations.
9. Cherry Point Approach Control must have a dedicated certified RADAR air traffic controller monitoring a 20-NM range from the transition area.
10. The Pilot in Command must maintain direct 2-way radio communications with the dedicated RADAR controller prior to departing the Cherry Point Class D, R-5306 and while in the transition area.
11. The UA will not be allowed out of the Class D or Restricted Area while there are non-participating aircraft within 20 NM of the transition area excluding all IFR aircraft on a discrete code and aircraft operating in the Craven Class D airspace area.
12. Prior to departing the Cherry Point Class D airspace corridor, Cherry Point Tower will contact Craven Regional Airport Tower and confirm that no VFR aircraft are departing the Craven Class D on a heading toward the UA transition area. If there are VFR aircraft on a heading toward the UA transition area, the UA will hold until the VFR aircraft is clear of the 20 mile radius
13. If a non-participating popup aircraft appears within 10 NM from the UAS (excluding traffic in the Craven Regional Airport Class D), the UA will be given traffic advisories, and a transmission in the blind will be made to the non-participating aircraft advising of UA activities in the area on the TRACON frequency (listed in the NOTAM). The UA will maneuver to ensure the UA does not come within 3 NM of any non-participating aircraft.
14. Participating aircraft and the UAS will be positively separated by 3 NM horizontally or 1000 feet vertically. The application of the above procedures shall not prohibit or unduly restrict flight by civil or military manned aircraft within the defined area or

within the Class D airspace.

15. Because of the unique operation the FAA will issue a D NOTAM outlining the UA operation the Name and Address of the Using Facility, Location, Altitude, operating Area, Time and nature of the activity including the requirement for transponder and Mode C operation.

**INCIDENT / ACCIDENT REPORTING:** The following information is required to document 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/annual 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 Communications.
- The following shall be submitted to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) within 24 hours:
  - Deviations from the “Special Provisions” contained in the COA.
  - All periods of Loss Link, including duration.
  - All incidents involving the UAS as defined in 49 CFR 830.
  - All accidents involving the UAS as defined in 49 CFR 830.

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 United States Marine Corps to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The United States Marine Corps is hereby authorized to operate the Shadow UAS in the operations area depicted in “Activity” above and attachment 1 below.

Attachment 1

