

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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 (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. See Special Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

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.

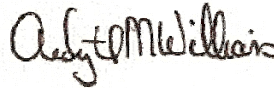
SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate (2008-ESA-39) is effective January 18, 2009, through March 18, 2009, 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 8, 2009
(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

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 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 COA (2008-ESA-39) is valid from January 18, 2009, through March 18, 2009. 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 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.

Because of the assigned National Defense requirement to deploy VMU-2 in late April, 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.

- For the purpose of see-and-avoid, visual observers must be used when operating in the Cherry Point Class D airspace.
- The observers may either be ground based or in a chase plane. The UA must remain within a lateral distance of no more than 1 nautical mile (NM) and 3,000 feet vertically from the visual observer. If the chase aircraft is operating more than 100 feet above/below and/or ½ nm laterally from the UA, the pilot of the chase aircraft will advise the controlling ATC facility.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR Part 91.111, *Operating Near Other Aircraft*, and 14 CFR Part 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 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 Part 67, Medical Standards and Certification, or a military equivalent. 14 CFR Part 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 Part 91.111, *Operating Near Other Aircraft*, 14 CFR Part 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 Part 67, Medical Standards and Certification, or a military equivalent. 14 CFR Part 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 Part 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 Part 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 must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR Part 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 Part 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 Part 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 Part 91.13, *Careless and Reckless Operation*, apply to UAS pilots.

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

- Unless specified 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.. 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.
- 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.
- Unless authorized in the Special Provisions section, 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.
- Operations shall not loiter on Victor airways. Transit of Victor airways shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR Part 91.159).
- The UA PIC or the pilot of the chase plane (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- The United States Marine Corps, 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. The USMC is responsible for notifying all Airport Managers and Fixed Base Operators within a 30-NM Radius of Cherry Point of UAS operations.
2. Cherry Point Approach Control must have a dedicated certified RADAR air traffic controller monitoring a 20-NM range from the transition area.
3. 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.
4. 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. This provision excludes all IFR aircraft on a discrete code and aircraft operating in the Craven Class D airspace area.
5. 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-NM radius.
6. 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.

7. 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.
8. 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.
9. In the event of a lost link, the UAS operator will immediately notify Cherry Point Approach Control by the most expeditious means (backup phone #: 252-466-7084), state pilot intentions, and comply with the following provisions:
 - 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 not coincide with the centerline of Victor airways.
 - If the lost link occurs on the way to or with in a Restricted or Warning Area, the UA will not exit the Restricted or Warning Area, unless the link has been re-established.
 - In the event of a lost link the aircraft will:
 - 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.
 - 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 8000' 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.
 - Operations within the R5306C/D: Lost link procedures direct the UAS to fly to the BT-3 impact range at an altitude of 8000' and hold. BT-3 is located inside the R5306C/D (NKT 225/25) and is uninhabited. BT-3 airspace extends from the surface to, but not including, FL 180 and is enclosed partially by the R5306D and the W-122 Warning Area. The Mission Commander will

immediately contact Camp Lejeune Range Control, call sign "Blackburn", via landline and inform them of lost link condition as well as the preprogrammed routing of the aircraft.

- 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 one of the procedures listed in the preceding paragraphs, as 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.
- 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.

NOTAM: A distance (D) Notice to Airman 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 operator 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 Reporting Provisions: 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 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 link (telemetry, command and/or control)
- The following shall be submitted via email or phone (202-385-4542, cell 443-569-1732) to Donald.E.Grampp@faa.gov **within 24 hours**:
 - 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 United States Marine Corps to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the appropriate Using Agency. The United States Marine Corps is hereby authorized to operate the Shadow Unmanned Aircraft System UAS in the operations area depicted in "Activity" above and at Attachment 1 below.

Attachment 1

