

Unmanned Aircraft System Operations Manual

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1. Preface

The following procedures are intended to promote safe, efficient and lawful operation of the ZOBEL AERIAL PHOTOGRAPHY unmanned aerial system (UAS). Safety, above all else, is the primary concern in each and every operation, regardless of the nature of the mission.

2. Philosophy & Mission Statement

It shall be the mission of those personnel of ZOBEL AERIAL PHOTOGRAPHY who are trained in the use of unmanned aircraft systems (UAS), to use this resource to take photos and video of customer's property or event.

It shall be the intent of every UAS operator to make reasonable effort to not invade a person's reasonable expectation of privacy when operating the UAS. When operating the UAS, ZOBEL AERIAL PHOTOGRAPHY operators abide by all FAA Regulations for flight and receive the proper authorization for flight.

3. Protection of Rights and Privacy

UAS operators and observers ensure the protection of private individuals' civil rights and reasonable expectations of privacy before deploying the UAS. UAS operators and observers ensure and are held accountable for ensuring that operations of the UAS intrude to a minimal extent upon the private persons and businesses. To accomplish this primary goal, ZOBEL AERIAL PHOTOGRAPHY observes the following:

1. When the UAS is flown, the onboard cameras are turned so as to be facing away from occupied structures, etc. to minimize inadvertent video or still images of uninvolved persons or property.
2. ZOBEL AERIAL PHOTOGRAPHY does not conduct random surveillance activities. The use of the UAS is tightly controlled and regulated.
3. All authorized missions for ZOBEL AERIAL PHOTOGRAPHY UAS are for:
 - A) Taking pictures and/or video of customer's house and property for the customer's own desired private use.
 - B) Surveying customer's crops and fields for the customer's own desired private use.
 - C) Taking pictures and/or video of the customer's event for the customer's own desired private use.
4. A committee is formed and meets semi-annually for the purpose of reviewing the existing UAS procedures as well new technologies, laws, and regulations on UAS usage. The committee consists of personnel from ZOBEL AERIAL PHOTOGRAPHY and business partners and advisors.
5. ZOBEL AERIAL PHOTOGRAPHY UAS operate strictly within the law and regulations. If in doubt, prior to operating the UAS we ensure that the proper forms and applications are applied for and obtained. We balance all operations with the need to accomplish the mission while maintaining public privacy and the freedom from intrusion.

4. Definitions

1. Aircraft: any contrivance invented, used, or designed to navigate, or fly in, the air.
2. Airport: a landing area used regularly by aircraft for receiving or discharging passengers or cargo.
3. Civil aircraft: an aircraft except a public aircraft.
4. Landing area: a place on land or water, including an airport or intermediate landing field, used, or intended to be used, for the takeoff and landing of aircraft, even when facilities are not provided for sheltering, servicing, or repairing aircraft, or for receiving or discharging passengers or cargo.

5. Administration

5.1 Operations Manual

1. The policies and procedures contained in this manual are issued by ZOBEL AERIAL PHOTOGRAPHY. As such it is an official business document of ZOBEL AERIAL PHOTOGRAPHY.
2. This manual is not intended to be all-inclusive, but as a supplement to other company guidelines, Federal Aviation Administration regulations, pre-flight safety checklists, aircraft manufacturers' approved flight manual, etc.
3. This manual is been written to address UAS operations as they existed when it was drafted. Equipment, personnel, environment (internal and external), etc., change over time. The management of change involves a systematic approach to monitoring organizational change and is a critical part of the risk management process. Given this, it is essential that this manual be continually updated as necessary. The entire manual must be reviewed, at a minimum, annually to assure it is up to date. Any changes to the manual will be communicated as currently dictated by company policy.
4. A copy of the manual (electronic and/or paper) is issued to every person having UAS responsibilities.

5.2 Organization

1. The UAS unit is comprised of those personnel approved by ZOBEL AERIAL PHOTOGRAPHY and includes operators, observers and others deemed necessary and an have assignment as part of the UAS crew.
2. Assignment to the UAS crew is carefully selected by ZOBEL AERIAL PHOTOGRAPHY from specially trained staff members of ZOBEL AERIAL PHOTOGRAPHY with knowledge of the airspace within which the operation will take place and how that airspace fits into the National Airspace System (NAS).

5.3 Personnel

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1. The UAS flight coordinator or pilot-in-command (PIC) is responsible for the overall direction and performance of the UAS unit and exercises command and control over it.
2. UAS Coordinator Responsibilities:
 - a. maintaining all training, flight and maintenance records for each operator and observer as well as individual airframes;
 - b. maintain contact with the FAA and regulations as they change
 - c. evaluate airframes based on mission needs;
3. Operators:
 - a. To be considered for selection as an operator, applicants must meet the requirements for and successfully pass a ZOBEL AERIAL PHOTOGRAPHY administered UAS Operators Course in order to be accepted into the UAS crew.
 - b. Operators interacting with Air Traffic Control (ATC) or Terminal Radar Approach Control Facilities (TRACON) shall have sufficient expertise to perform that task readily. Operators must have an understanding of, and comply with FAA Regulations applicable to the airspace where the UAS operates.
 - c. An operator's primary duty is the safe and effective operation of the UAS in accordance with the manufacturers' approved flight manual, FAA regulations and company policy and procedures. Operators must remain knowledgeable of all FAA regulations; UAS manufacturer's flight manual and bulletins and company policy and procedures.
 - d. Operators may be temporarily removed from flight status at any time by the UAS coordinator, for reasons including performance, proficiency, physical condition, etc. Should this become necessary, the operator will be notified verbally and in writing of the reason, further action to be taken and expected duration of such removal.
 - e. The UAS Coordinator shall maintain a file for each operator which shall include copies of training records, flight incidents, etc. This file is reviewed in accordance with current company policy and procedures.
4. Observers
 - a. Observers must have been provided with sufficient training to communicate clearly to the operator any turning instructions required to stay clear of conflicting traffic and obstacles. Observers receive training on rules and responsibilities described in 14 CFR 91.111, Operating Near Other Aircraft, 14 CFR 91.13, Right-of-Way Rules, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. 14 CFR 91.17, Alcohol or Drugs, applies to UAS observers.
 - b. An observer's primary duty is to operate the UAS's equipment including cameras, FLIR, radio communications with other crew members and property owners as well as be an observer for anything that may affect the operator's primary duty (see and avoid).
 - c. The UAS Coordinator maintains a file for each observer, which includes copies of training records, UAS incidents, etc.

5.4 Facilities

1. UAS operations are housed and maintained at a facility designated by ZOBEL AERIAL PHOTOGRAPHY. Personnel must not leave the designated facility without making sure the UAS equipment is secured.
2. All personnel are equally responsible for maintaining the facility in a neat, clean and orderly fashion.

5.5 Scheduling

1. To facilitate the broad use of the UAS, it shall be made available to all UAS flight crew members.
2. To maintain a level of proficiency with the UAS, operators are required, as part of their acceptance into the UAS flight crew, to attend training every two months. Training is coordinated through the UAS flight crew and announced in advance for scheduling purposes.

5.6 Miscellaneous

1. Inquiries from the news media must be forwarded to the ZOBEL AERIAL PHOTOGRAPHY owner, Jeremy Zobel. Operators/Observers shall follow currently established company policy regarding interactions and inquiries from the media.
2. Requests for support from third-parties will be responded to by the UAS coordinator. Should the request involve an immediate threat to life, or property, the operator is authorized to accept or decline the request. Proper policy and procedure, as well as FAA regulations must be followed when accepting mutual aid support for the UAS.
3. Complaints or inquiries regarding UAS operations must be referred to the UAS coordinator.

6. Safety

6.1 Safety Policy

1. ZOBEL AERIAL PHOTOGRAPHY is committed to having a safe and healthy workplace, including:
 - a. The ongoing pursuit of an accident free workplace, including no harm to people, no damage to equipment, the environment and property.
 - b. A culture of open reporting of all safety hazards in which management will not initiate disciplinary action against any personnel who, in good faith, disclose a hazard or safety occurrence due to unintentional conduct.

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- c. Support for safety training and awareness programs.
 - d. Conducting regular audits of safety policies, procedures and practices.
 - e. Monitoring the UAS community to ensure best safety practices are incorporated into the organization.
2. It is the duty of every member within the UAS flight crew to contribute to the goal of continued safe operations. This contribution comes in many forms and includes always operating in the safest manner practicable and never taking unnecessary risks. Any safety hazard, whether procedural, operational, or maintenance related must be identified as soon as possible after, if not before, an incident occurs. Any suggestions in the interest of safety should be made to the UAS Coordinator.
3. If any member observes, or has knowledge of an unsafe or dangerous act committed by another member, the UAS coordinator is to be notified immediately so that corrective action may be taken.

6.2 Operational Hazard and Occurrence Report (OHOR) and Investigations

1. Occurrences are unplanned safety related events, including accidents and incidents that could impact safety. A hazard is something that has the potential to cause harm. The systematic identification and control of all major hazards is foundational to safety.
2. The OHOR concept provides a mechanism to report hazards and occurrences, real and perceived, to those responsible for UAS operations.
3. There is no specific format for the OHOR as the information provided is what is important, not the format and should be used without hesitation to report any anticipated, current, or experienced safety hazard, or occurrence. Further, the OHOR can be submitted anonymously, and to whatever level in the chain of command, to get the matter proper attention, without fear of reprisal.
4. Written memorandums fully explaining the problem will be given to the UAS coordinator for investigation.
5. Every hazard and/or occurrence is investigated, with the results and corrective action taken communicated to all members. The investigation will be conducted by the UAS coordinator or any other member of the company who has the technical skill necessary to do it. The services of an independent subject matter expert may be necessary in some cases to assure a thorough and complete investigation.
6. Hazards requiring immediate attention will be brought to the attention of the UAS coordinator, verbally, without delay.
7. ALL MEMBERS ARE AUTHORIZED TO TAKE ACTION TO CORRECT A HAZARD if in that member's opinion delay will result in accident or injury. The UAS coordinator will be notified immediately in such situations.

6.3 Safety Officer - Operator/Observer/Coordinator

1. In regards to safety, all members of the UAS flight crew are responsible for the following:

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- a. Ensuring all flight operations personnel understand applicable regulatory requirements, standards and organizational safety policies and procedures.
- b. Observe and control safety systems by monitoring all operations.
- c. Review standards and the practices of company personnel as they impact operational safety.
- d. Communicate all reported safety related problems and the corrective action taken. If there were any in-flight problems (or learned experiences), the proper procedures for handling that problem should be discussed.
- e. Copy and circulate pertinent safety information.
- f. Copy and circulate emergency safety bulletins.
- g. Place any electronic copies of safety information or bulletins in a conspicuous location for all employees to access.
- h. It is emphasized again that safety is the responsibility of ALL members of the UAS unit.

6.4 Safety Training

1. All members shall receive training in the following subjects prior to operating the UAS:
 - a. Company commitment to safety
 - b. Company policy
 - c. UAS member's role in safety
 - d. Emergency safety procedures
2. All members shall review the company safety policy and procedures on an annual basis and that review shall be noted in their training history.

6.5 Medical Factors

1. Operator and Observers shall only deploy the UAS when rested and emotionally prepared for the tasks at hand.
2. Physical illness, exhaustion, emotional problems, etc., seriously impair judgment, memory and alertness. The safest rule is not to act as an operator or observer when suffering from any of the above. Members are expected to "stand down" when these problems could reasonably be expected to affect their ability to perform flight duties.
3. A self-assessment of physical condition shall be made by all members during pre-flight activities.
4. Performance can be seriously hampered by prescription and over-the-counter drugs. The UAS Coordinator must be advised anytime such drugs are being taken. If it is determined that the medication being taken could hamper an operator or observer, that member shall be prohibited from the deployment or exercise.
5. No member shall act as an operator or observer within eight hours after consumption of any alcoholic beverage, while under the influence of alcohol, or while having an alcohol concentration of 0.04 (FAR 91.17)

7. Training

7.1 Objective

1. The key to continued safe operations is by maintaining a professional level of competency. The first step in this process is establishing minimum qualifications for selecting members, and the second step involves training those personnel.

7.2 Instructors

1. If any members are FAA certified flight instructors, they are given instructor duties. Such duties can include developing training courses, provide training, and student evaluation and documentation.
2. Duties of instructing new members shall fall upon those who have the most flight time and knowledge of UAS operations. Instructors are designated by those within the unit and approved by the UAS Coordinator.

7.3 Training Plans

1. All members have a training plan on file that outlines training objectives for the upcoming year. This training plan will be held in conjunction with the member's normal training file per company policy.
2. The approved training plan is developed by the UAS coordinator.
3. All deployments or exercises are documented and count toward a member's training.
4. It is the member's responsibility to verify their training file contains all pertinent information.

7.4 Initial Training

1. Observers and Operators must have completed sufficient training to communicate to the pilot any instructions required to remain clear of conflicting traffic. This training, at a minimum, shall include knowledge of the rules and responsibilities described in 14 CFR 91.111, Operating Near Other Aircraft; 14 CFR 91.113, Right-of-Way Rules: Except Water Operations; and 14 CFR 91.155, Basic VFR Weather Minimums; knowledge of air traffic and radio communications, including the use of approved ATC/pilot phraseology; and knowledge of appropriate sections of the Aeronautical Information Manual.
2. In conjunction with fulfilling all training requirements for operator/observer duties, the new member must also become familiar with UAS operations, the aircraft and its equipment.
3. Any new member who fails to successfully complete the initial training may be denied as a member of the UAS flight crew.

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4. Before a member can fly as an operator, they must complete at least 10 hours of flight training with the UAS instructors to show proficiency of the flight training exercises and the airframe. This must be accomplished to show their ability and knowledge of the UAS.

7.5 Recurrent Training

1. All members within the unit shall maintain proficiency in their operator/observer abilities. Members who do not have any documented training or flight time within a span of 90 days will have to show proficiency before being an operator/observer during a deployment or exercise.
2. Recurrent training is not limited to actual operating/observer skills but includes knowledge of all pertinent UAS/aviation matters.
3. Failure to prove proficiency can result in removal from UAS responsibilities.

7.6 Miscellaneous

1. Depending on the nature of the training request, all efforts are made to accommodate the hours of training so as little impact is made to staffing levels.
2. All requests for training shall be approved through the member's chain of command and timekeeping during those training hours are marked by the UAS coordinator.
3. Members are encouraged to attend, and forward information on FAA sponsored safety seminars.
4. Training shall only be conducted at approved locations and follow the provisions within the approved FAA regulations.

8. General Operating Procedures

8.1 Request for UAS Support

1. Requests for UAS support shall be made through the UAS coordinator who has the most current list of UAS operators and observers to contact.
2. Requests for UAS support can be made at any time during the day or night.
3. The UAS coordinator will submit a written Plan of Activities to the local FAA FSDO three days before the proposed mission.
4. If a request is made for UAS support during the night, ZOBEL AERIAL PHOTOGRAPHY must contact the local FAA FSDO for approval.

8.2 Call-out Procedure

1. The UAS coordinator will screen all initial requests to use a UAS.
2. The UAS coordinator will then contact the PIC to request the deployment of the UAS.
3. The UAS Coordinator will also contact the UAS flight crew who will screen the request using the following factors:

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- a. Is the proposed use of UAS within the capabilities of the UAS equipment and personnel to perform?
 - b. Does the proposed use of the UAS fall within the FAA and department policies and regulations for UAS usage?
 - c. Can the UAS be deployed safely given current weather conditions?
 - d. If the UAS deployment requires a warrant has one been requested and approved?
 - e. Are sufficient trained and qualified personnel available to safely operate the UAS?
4. The UAS flight crew will either accept or decline the request for UAS support. If the request is denied the UAS flight crew will provide a reason for declining the support request to the UAS Coordinator who will provide the requestor this information along with the reason for declining. If the UAS Coordinator accepts the support request they will contact a UAS operator who will be provided all available mission information.
5. The UAS operator will contact a certified observer from the list of available trained observers. The UAS operator is responsible for transporting the UAS and all required equipment to the scene. Upon arriving at the requested location the UAS operator will contact the requestor to check in and receive a briefing on the mission requested. The UAS operator will make an on scene determination of the ability of the UAS to perform the requested mission safely and within company and FAA policies and procedures.
6. If the UAS operator determines that the use of the UAS would violate company policy or directives then the UAS operator will inform the requester of the potential conflict along with recommendations for modifying the requested mission to conform to company policies and procedures. As this is a change from the original approved mission the UAS operator will contact the UAS coordinator for direction on how to proceed. As soon as possible after the completion of the mission, the UAS operator will make a full report of the circumstances and their concern through the UAS coordinator.
7. UAS operators will have sole discretion for declaring safety or violation of FAA rules. If the UAS operator determines that a requested mission would violate FAA rules or endanger person or property, then the UAS operator will respectfully inform the requester of the reasons for refusing to operate the UAS and contact the UAS coordinator immediately. The UAS will not be flown in this circumstance and the authority of the UAS operator is absolute.
8. If the UAS operator determines that the requested mission will potentially damage the UAS or its associated equipment the UAS operator will inform the requestor of their concerns. The UAS operator will fully document and send a report to the UAS coordinator.

8.3 Deployment Priorities

1. The UAS shall not be used for the purpose of random surveillance.
2. If several separate requests for UAS support are received simultaneously, they shall be prioritized.

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3. In general terms, requests for UAS support are prioritized as:
 - a. Which ever customer requests service first will be prioritized.

8.4 Flight Boundaries

1. Although there may be requests for UAS support in restricted airspace, FAA regulations for UAS restrict UAS deployment inside restricted airspace.
2. At no time shall UAS support be granted inside restricted airspace without first obtaining permission from the local FAA FSDO and approval by local authorities.
3. Maximum altitude shall not be set more than 400 feet per the FAA regulatory standards.
4. The operator will obtain the consent of all persons involved in the mission and ensure that only consenting persons will be allowed within 100 feet of the flight operation, and this radius may be reduced to 30 feet based upon an equivalent level of safety determination.

8.5 Minimum Personnel Requirements

1. Due to the nature of the mission, the minimum personnel required on ALL missions will be an operator and observer. Under no circumstances will an operator attempt to complete a deployment alone.
2. Although training is not considered a mission, an observer shall be used.

8.6 Personnel Responsibilities for Deployments

OPEN COMMUNICATION ACHIEVES SAFE OPERATIONS

1. Operator
 - a. The operator is directly responsible for, and is the final authority over the actual operation of the UAS.
 - b. Operators have absolute authority to reject a flight based on personnel safety or violation of FAA regulations. No member of ZOBEL AERIAL PHOTOGRAPHY, regardless of status, shall order an operator to make a flight when, in the opinion of the operator, it poses a risk to personnel or is in violation of FAA regulations.
 - c. Operators are responsible for compliance with this manual, company policy and procedure and FAA regulations.
 - d. The operator's main duty during the deployment of the UAS is to operate the UAS safely while accomplishing the goals of the deployment.
 - e. Operators shall see-and-avoid any obstacle that will lessen safety during the mission.
 - f. Operators shall be responsive to the requests of the observer in order to accomplish the deployment.
 - g. Operators shall be responsible for documentation for mission training and updating of flight books.
2. Observer

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- a. Observers shall see-and-avoid any obstacle that will lessen safety during the mission.
- b. Observers are responsible for the operational aspect of the deployment.
- c. Observers shall operate any attachments to the UAS, allowing the operator to maintain complete focus on the operation of the UAS.
- d. Observers shall remain alert for suspicious persons or activities on the ground and coordinate response by other UAS flight crewmembers.
- e. Observers shall assist the operator in the main objective of safe operations of the UAS.
- f. Observers shall be responsible for documentation for mission training and updating of flight books.

8.7 Personal Equipment

1. Operators/Observers shall wear eye protection at all times while the UAS is in flight.
2. Although there is no specific uniform for the UAS unit or required for proper operation of the UAS, the operator/observer should take necessary measures to deploy in a professional matter, wear Hi-Visible vests when appropriate, and take into consideration that all deployments are subject to media requests.
3. Operators/Observers will take into consideration the current weather conditions when planning to deploy, and wear appropriate clothing to deploy comfortably.
4. There are no documented issues with the use of the radio or cellular phones during the deployment of the UAS, but the operator/observer should at all times take into consideration safe operation of the UAS when using a radio or another device (use of the radio or other device is strictly prohibited by the operator during flight).
5. Operators/Observers shall wear clothing that easily identifies them as ZOBEL AERIAL PHOTOGRAPHY UAS Flight Crew members.

9. Pre-Flight/Post-Flight Actions

9.1 Inspections

1. Operators/Observers are both responsible for a thorough preflight inspection of the UAS.
2. Before and after each deployment (whether a mission or training), the operator and observer shall conduct a thorough inspection of the UAS in accordance with the instructions contained in the manufactures user's manual.
3. Any issues found that will put in jeopardy the safe operation of the UAS shall be documented and resolved immediately prior to flight.
4. It has been recognized that the use of a checklist is a significant method to combat UAS accidents. A pre-flight checklist is contained with each UAS Base Station and is utilized prior to each flight.

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5. Any physical equipment that cannot be resolved on-site, and which have an impact on safety or the mission, will override the deployment. These issues will be resolved before flight.

9.2 Weather

1. Before each deployment the operator/observer will ensure that he/she gathers enough information to make themselves familiar with the weather situation existing throughout the area of deployment. The operator shall utilize FAA approved weather resources to obtain the latest and most current weather conditions.
2. An anemometer should be utilized in order to better estimate the wind speed and determine if it is within the capabilities of the airframe being flown.
3. Operators/Observers should use the Beaufort Scale when making deployment decisions in regards to wind conditions.
4. The weather conditions reported for the operation shall be recorded in the pre-flight checklist.
5. The operator shall ensure that the flight will occur within FAA VFR weather requirements.

9.3 Documentation

1. Inspection and weather will be documented prior to flight within the log book.
2. After each flight, the operator will complete a statement documenting the UAS operations.

9.4 Planning

1. The operator/observer shall familiarize themselves with all available information concerning the deployment including, but not limited to, the weather conditions, hazards, description of the incident, deployment goals, etc.
2. Operators will ensure that the location for take-off and emergency landing is adequate for a safe deployment.
 - a. The take-off/landing area should be clearly marked and identifiable with short cones.
 - b. At least one emergency landing area should be identified per deployment.
3. Operators will ensure that they are aware of their surroundings in the event that an emergency landing is necessary. This includes the ability to recover the UAS.

9.5 Checklists

1. Operators shall utilize pre-flight checklists to ensure the highest level of safety for deployment.
2. Prior to flight, the flight log shall be initiated.

9.6 Maintenance

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1. Although there are few parts on the UAS that need servicing, it is necessary that the manufacturer's maintenance schedule is followed and properly documented.
2. Any issues that arise during maintenance that cannot be resolved by routine methods shall be forwarded to the manufacturer for further technical support.

9.7 Other

1. Operators/Observers will ensure that no items are attached to the UAS prior to flight that are not required for safe operation and to complete the mission goal.