

WPSD Aerial Camera

Operations Manual

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Credits

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This manual has been modified and accepted for use by Paxton Media Group – WPSD Local 6.

Introduction

This text is a guide for safely conducting aerial camera journalism field work. It takes into account America's current sUAS regulations, our understanding of the public's acceptance of sUAS, the state of sUAS technologies, and our own experiences.

The number one goal of any sUAS journalism operation is safety. At no time should safety be compromised. If there is any doubt, return the sUAS, also known as an unmanned aerial system (UAS), to the landing zone and terminate the flight. Ethical journalism is responsible journalism, and flying a sUAS means taking responsibility for the safety of those near you, on the ground and in the air.

The three flight operations roles defined in the Drone Journalism Lab Operations Manual are Pilot In Command (PIC), Observer, and Journalist. One individual can fill all three roles, which we define below:

The Pilot In Command: The PIC is responsible for all flight operations. It is the PIC who has the ultimate authority on any flight. The PIC determines if the aircraft is airworthy and capable of conducting the proposed operations. The PIC is responsible for determining if the airspace allows the proposed operation. The PIC is responsible for conducting operations within all FAA regulations and any restrictions set forth by a grant of exemption. The PIC is responsible for briefing the other members of the flight crew about what the mission is, what their roles and responsibilities are, and what is expected of them before, during and after flight operations.

NOTE: The pilot in command, the one holding the FAA issued Part 107 certificate, is by regulation the final authority on if the aircraft flies or not. If an accident occurs, it is the Part 107 certificate holder who will be held responsible. As such, managers, producers, sales executives and journalists must accept the pilot in command's decision about flight safety as final.

The Observer: The Observer is responsible for monitoring the operational area to ensure that there are no hazards that may endanger the flight or people not part

of the UAS flight operations team. The Observer is the only member of the team who can speak to the PIC during flight operations. The Observer is to alert the PIC immediately if any aircraft come into the area, or if any person or vehicle comes near the operation. The Observer must remain within speaking distance of the PIC. Do not use radios to communicate.

The Journalist: The Journalist is responsible for communicating flight goals to the PIC before flight and verifying results after landing. The Journalist determines what is needed for the story and communicates that to the PIC. The PIC is responsible for determining if the Journalist's goals are possible under the conditions presented. During flight, the PIC may ask for feedback from the Journalist, but the Journalist should only speak to the pilot if asked while the aircraft is aloft. The Journalist can act as Observer.

Under Part 107, operations can occur with only a PIC. If no additional personnel are available for the flight, care and consideration must be taken for the additional workload that the PIC will take on, including having to watch the operation area for hazards, completing journalistic goals and ensuring flight safety.

NOTE: The greater the number of environmental variables (bystanders, structures, trees, wind, etc.) in an operating environment, the more substantial the demands are on the PIC.

Supervising PIC/Non-Part 107 Piloting: The aircraft may be operated by a WPSD employee NOT holding a FAA certificate as a Remote Pilot in Command, with the approval of an the Remote Pilot in Command, however those individuals must be overseen by a Part 107 certificate holder.
(This operation will only be conducted for training purposes or while activities are in a sparsely occupied area.)

Insurance

Global Aerospace insures all approved UAS operations of WPSD. Such coverage shall not apply while a scheduled aircraft is in flight unless the pilot in command is approved by Paxton Media Group, LLC and appropriately licensed for the flight being conducted. All approved PICs operating on behalf of WPSD are trained in flight operations, emergency procedures, aeronautical decision-making, ethics and sUAS journalism by the Poynter Institute along with the University of Nebraska-Lincoln. As well, all PICs are FAA licensed with a minimum rating of UAS Remote Pilot.

Ethics and Privacy

UAS enable individuals to remotely access spaces and vantage points that may, for many reasons, be otherwise out of reach. Avoid actions in the air that you yourself would not engage in on the ground.

Consider referring to the SPJ Code of Ethics in order to minimize harm, which include but are not limited to:

- **"Balance the public's need for information against potential harm or discomfort. Pursuit of the news is not a license for arrogance or undue intrusiveness."** While Part 107 prohibits flights over people it doesn't stop you from flying near them laterally.
- **"Avoid pandering to lurid curiosity, even if others do."** Be mindful of bystanders and consider their perceptions of aerial cameras, and what you're doing in the air with a UAS. Remember: They don't know what you are going to do with a device that makes many uncomfortable. Don't deliberately fly over private property if publicly accessible views are available. Don't use a sUAS to antagonize.
- **"Show compassion for those who may be affected by news coverage. Realize that private people have a greater right to control information about themselves than public figures and others who seek power, influence or attention. Weigh the consequences of publishing or broadcasting personal information."** In short, respect people's privacy, and don't use a UAS as a tool for intrusion. Don't fly up to people's windows, and seek permission to fly over private property where practical. While there has been extensive speculation about how high above the ground private property extends, there is currently no clear legal precedent indicating where private property ends and public airspace, in the context of aerial cameras, begins. Until a legal standard is set, all due caution should be exercised.

Also, consider referring to the National Press Photographers Association Code of Ethics, including the following standards:

- **"Do not intentionally sabotage the efforts of other journalists."** When covering a news event along with other media organizations flying UASs, avoid using your UAS to obstruct or take down another UAS. Doing so could

not only hurt bystanders and damage property, but also require a report to the FAA, jeopardizing your Part 107 certification. Media using UAS should coordinate with each other, just as manned helicopter pilots have done since the 1950s.

- **"While photographing subjects do not intentionally contribute to, alter, or seek to alter or influence events."** UAS systems, especially multirotors, are loud. Consider how the noise generated by your UAS, and its presence, influences events, people, and animals.

General Operating Procedures

A professional UAS operation is one that involves careful planning and forethought. Before embarking on using aerial cameras to do journalism, pilots and organizations should take several steps. First and foremost, the pilot should practice with the sUAS to be used. Your first flight with the sUAS should not be for a story. Familiarization with the platform is essential. WPSD will attempt to communicate with local responders alerting them of future potential news-gathering using sUAS.

The general operating procedures for sUAS flights are divided into sections: Pre-trip, Pre-flight, Flight, and Post-flight. The general requirements in each are encapsulated in checklists designed to help ensure each step is accomplished. The sections, and the reasoning behind them, are described here:

Pre-Trip

Prior to embarking on any sUAS operation, the pilot in command must gather information about the proposed flight area to ensure safe operations that comply with Federal Aviation Regulations.

Location

The location and its airspace classification can be determined by using an app/website such as AirMap, B4UFly, KittyHawk, Drone Plane or the like.

Questions the PIC must answer about the location are:

- What is there? Are there hazards to aviation?
- What airspace is it in?

- Do you need permission from air traffic control (ATC)?
- Are you flying on or over private property? Do you have permission of the landowner to operate there?
- How many people can you expect around the area?
- What is your plan to prevent flight over people?
- Have you conducted a site survey or been to the location prior?
- Have you consulted weather sources, such as an aviation weather report (METAR), or obtained a flight briefing from Flight Services?
- Are your weather parameters within Part 107 minimums?
- Are winds levels (including gusts) below the operational maximums set by manufacturers guidelines?
- What's the altitude of the location?
- Have you factored in the effects of temperature on the batteries?

Defining Operational Goals

Before bringing a UAS into an environment, operational personnel should define the goals of the UAS flight before leaving for the location.

- What shots do you need?
- What purpose is the sUAS serving in your story?
- What privacy issues can you anticipate and what steps have you taken to mitigate them?
- What ethical issues can you anticipate and what steps have you taken to mitigate them?

Logistics

Before leaving for the operational area, consider what equipment you will need, and check the status of your equipment.

- When do you need to be at the location?
- Is a visual observer needed for the location?
- How much travel time is involved?
- Have you built in time for a walkthrough of the location to note any hazards only visible on site?
- Do you have sufficient battery power in all equipment to accomplish the task?

Pre-Trip Inspection

Before leaving for the operations area, the PIC should conduct a pre-trip inspection of the UAS. A pre-trip inspection includes charging batteries, checking various mounting hardware, and checking the camera and storage media to ensure it is sufficient for the task.

Briefing

The PIC is responsible for briefing all operations personnel on each phase of flight. The PIC will designate the observer (if necessary) and the journalist, will explain their roles and what will happen during flight.

A PIC briefing should cover, at a minimum:

- Who is fulfilling each role in flight operations.
- The expectations of each member of the flight crew.
- A general description of the operations area.
- The expected weather at the location.
- Any known hazards, including winds, obstacles, known high traffic areas, any nearby airports or expected air traffic.
- The specific mission goals, including expected shots, angles or subjects.
- Any known privacy or ethical issues and mitigation steps.

For the purpose of flight planning, weather conditions, including wind speeds, will be gathered by from the nearest FAA regulated airport's current AWOS, ASOS or ATIS system. However, final decision as to the wind and its affect on the mission is decided at the Remote Pilot in Command's discretion.

Pre-Flight

Pre-flight operations are done immediately before any flight work is to occur. The pre-flight checklist repeats some of the pre-trip checklist, such as inspecting the aircraft and some of the control surfaces. Pre-trip and pre-flight inspections help ensure airworthiness and will serve as an early warning for both maintenance issues and for mechanical issues that could substantially affect or cancel flight operations.

** This is the time when a PIC completes the required online form (denoting PIC, location and purpose of mission) for WPSD notification of UAS activity that is automatically sent to predetermined parties at WPSD.*

The general rules of pre-flight are:

- **The PIC touches the UAS.** The PIC is responsible for the aircraft and all around them. Thus, the PIC will conduct the pre-flight inspection, connect the batteries, etc.
- When on site, operations personnel must delineate a takeoff and landing area of at least 10 feet x 10 feet and ensure it is free of debris.
- When on site, if non-operations people are around, operations personnel may be required to secure an area to be kept free of people so the UAS can operate without flying over people. That place may be the takeoff and landing zone. That space, to remain free of people, should be as large as the PIC thinks is practical.
- Weather can be very localized. When you arrive, you should check your location weather against the weather report you got from a flight briefing or automated observation service. Cloud ceilings will be most difficult to estimate on site, so be reasonable. If the clouds look low, stay low. Don't fly if fog is present.
- Before takeoff, make sure your compass is not receiving interference from nearby metal objects, and that you have enough GPS satellite connections.

Flight

The flight checklist isn't really a checklist. It's a Do Constantly list. It's listed as a reminder. UAS operators must:

- Be constantly scanning for airborne traffic or obstacles. The observer must report them immediately.
- Be constantly scanning for people on the ground in the flight area. The observer must report them immediately.
- Be constantly checking battery levels, while allotting time for the aircraft to return to the home point.
- Be constantly checking altitude to ensure they remain within restrictions.

At battery changes, and at battery changes only, should the PIC, Observer and Journalist discuss changes to the operational plan. While the UAS is in flight, the PIC needs to focus on flying, and the observer needs to focus on hazards.

Post-Flight

The post-flight checklist is broken into three parts: Shutting down the sUAS, which is done by the PIC; inspecting the aircraft; and filling out logs. Logging is an important part of aviation safety and will serve as an important document in maintenance of your UAS.

** This is the time when a PIC completes the required online form (denoting date of operation, time, location, PIC, person flying if not PIC, Approximate length of flight, batteries used for flight and notes about flight) for WPSD notification of UAS activity and records used for logging information.*

Logging

UAS operations can be divided into three separate logs, largely transported over from manned aviation. They are a maintenance log, a battery log, and a flight log.

Maintenance Log

A maintenance log is a simple list of issues to be checked or fixed between flights. PICs should note any issue that should be checked, from an odd wobble, unusual sound, an unusually hot motor at landing, to a complete component failure. The log should include the date, UAS Make & Model, UAS Registration Number, the ID number of the battery used when the issue occurred, the issue, who reported it, the date repaired, who repaired it and notes.

Flight Log

A flight log will be completed via the WPSD predetermined online form that highlights the important events that occur from the time a UAS takes off to the time it has landed and been powered down by the PIC. Each UAS will have its own log. It includes the location, the date, the battery(s) used during flight, and the approximate total flight time. Each entry should also have space for important and relevant notes about the flight, which may include a mission overview, flying conditions, distance flown, take-off and landing locations, a hard landing, etc.

Pre-Trip Checklist

Normal Operating Checklists

Item	Action
Batteries	Charge
Controller Batteries	Charge
Propeller nuts	Check and tighten
Landing strut screws	Check and tighten
Motor mount screws	Check and tighten
Gimbal mount	Check and tighten
Gimbal camera harness	Check and tighten
Compass wiring	Check and reseal
Airframe check	Inspect for damage
Registration markings	Check for display
Camera memory card	Check and empty
Mission planning meeting	Goals of the flight
Airspace check	Consult airspace map, NOTAMs, TFRs
Airport check	Contact ATC, if needed

Pre-Flight Checklist

Item	Action
Weather	Check location conditions against weather reports
Wind conditions	Measure at location, check operation maximums
Flight area	Visually inspect for hazards, note, and report
Takeoff/landing area	Delineate and clear of debris
Operations area	Delineate > 15 feet from takeoff area
Flight area	If needed, secure flight area to be kept free from people to ensure safety
Pre-flight meeting	Review goals
Airworthiness check	Visually inspect aircraft
Airworthiness check	Visually inspect control surfaces and linkages
Airworthiness check	Inspect props for balance, damage

Pre-Flight Checklist Continued

Item	Action
Airworthiness check	Check camera/gimbal security
Airworthiness check	Verify controller batteries
Airworthiness check	Verify controller is on
Airworthiness check	Verify UAS battery
Airworthiness check	Verify UAS battery is on
Airworthiness check	Verify display panel working properly
Airworthiness check	Calibrate compass, if necessary
Airworthiness check	Check navigation and telemetry connection
Non-PIC personnel	Leave takeoff area, if present
PIC	Leave takeoff area before launch
Video monitor	Check wireless connection
All clear check	Check takeoff area, airspace, flight area
Power up	Unlock motors, increase throttle
Final pre-mission check	At low hover, check telemetry status
Final pre-mission check	At low hover, check prop balance and controls

Flight Checklist

Item	Action
Airborne hazard check	Observer reports immediately (Over-communicate)
Ground hazard check	Observer reports immediately
Battery check	PIC monitors battery levels frequently
Flight parameter check	PIC evaluates altitude
Low battery alert	Return to landing area
Battery change	Pilot in command changes the battery
Battery change meeting	Evaluate mission goals

Post-Flight Checklist.

Item	Action
Power Down UAS	PIC powers down UAS
Power Down Controller	Turn off after UAS
Motor check	Touch motors to check for overheating
Camera	Turn off if required
Propellers	Visual inspection, log changes
Landing struts	Visual inspection, log changes
Gimbal	Visual inspection, log changes
Housing	Return UAS to case after inspection
Flight log	Update flight log (WPSD online form)

Emergency Procedures

Lost Link/Mission Procedures

General Operational Guidelines: The RC link is for the PIC to directly control the aircraft. If the PIC enables the UAS to operate autonomously and automated flight functionality is lost, the sUAS will revert to RC control and the PIC will take over flight, return it to the landing zone and land. If the UAS starts showing any sign of not following the automated flight path, and the manual override doesn't happen automatically, the PIC should take the steps necessary for manual control. Check your UAS manual for how to manually override autonomous operation. If the RC link is lost, many commercial based UAS systems are configured with an automatic return to home procedure built-in to the UAS flight controller to prevent drift outside of the operation area.

Lost Autonomous Flight Procedure Checklist

Actor	Action
PIC	Verifies automated flight has stopped
PIC	Verbally notifies Observer
PIC	PIC assumes control via RC, if possible
Observer	Observer notifies other operations personnel
PIC	Returns UAS to pre-determined landing area as safely practical
PIC	Land UAS

Lost RC Control Procedure Checklist

Actor	Action
PIC	Verifies lost link
PIC	Verbally notifies Observer
Observer	Verbally notifies other operations personnel
PIC	Turns off RC controller
PIC	Turns RC controller on
PIC	If positive control returns, PIC lands immediately
PIC	If positive control does not return, PIC alerts Observer
PIC	Verifies that Return to Home function has engaged
PIC/Observer	Verifies that landing area is clear, clear if necessary
PIC	Upon UAS landing PIC turns off UAS immediately

Emergency Assumption of Control

During any automated flight, if there is any concern that the UAS is not flying the planned mission or that control characteristics are abnormal, the PIC will take manual control of the UAS with RC control, return it to the landing zone if possible, and land it. There may be minor problems that do not require emergency assumption of control. In these cases, the GCS communication can direct the UAS to land or the PIC can manually land the UAS.

Emergency Assumption of Control Checklist

Actor	Action
PIC	Verifies abnormal operation
PIC	Verbally notifies Observer
Observer	Verbally notifies other operations personnel
PIC	Assumes control of UAS using RC
PIC	If necessary, begin emergency landing at a safe location
PIC	If practical, return UAS to pre-determined landing zone, execute landing

Loss of Sight

Regulations require that the UAS remain within Visual Line of Sight(VLOS) at all times. If, that VLOS is broken, the PIC should return to VLOS immediately if possible. If PIC cannot return UAS to VLOS, using the GCS, the PIC should execute a preprogrammed flight path to return to the landing zone.

Loss of Sight Checklist

Actor	Action
PIC	Notifies Observer of broken VLOS
Observer	Reports if UAS is within Observer's VLOS
Observer	If UAS is out of VLOS, alert PIC to begin Loss of Sight procedures
PIC	If possible, reverse course to return to VLOS as soon as safe
PIC	If course reversal is not possible, execute return to home procedure via RC Control or GCS
PIC	Report when UAS is in VLOS
Observer	Report when UAS is in VLOS
PIC	Post flight, record conditions that led to loss of VLOS

Other In-Flight Emergencies

In most emergency situations, the general protocol is to land as soon as is safely practical. In many emergency situations, landing at the pre-determined landing zone will not be possible. The goal is a controlled, safe landing.

Loss of Power/Motor

Actor	Action
PIC	Attempt control the UAS to land in open, safe area
PIC	Alert operations personnel of emergency situation
Observer	Alert others to emergency situation
PIC	Post flight, record details of flight for report

In-Flight Fire

Actor	Action
PIC	Attempt control the UAS to land in open, safe area
PIC	Alert operations personnel of emergency situation
Observer	Alert others to emergency situation
PIC	Post flight, record details of flight for report

Crash/Uncontrolled Grounding

Actor	Action
PIC	Attempt control the UAS
PIC	Alert operations personnel of emergency situation
Observer	Alert others to emergency situation
PIC	Input power down input of throttle to -100% ONLY
PIC	Post flight, record details of flight for report

Glossary

AGL - Above Ground Level.

GCS - Ground Control Station.

Journalist (as defined in this manual) - Responsible for communicating flight goals to the PIC before flight and verifying results after landing.

NOTAM - Notice to Airmen. A notice released by an aviation authority to alert PICs of potential hazards on a flight route, or at a location that could affect the safety of the flight.

Observer (as defined in this manual) - Responsible for monitoring the operational area to ensure that there are no hazards that may endanger the flight or people not part of the UAS flight operation team.

PIC - Pilot In Command. Responsible for all flight operations.

UAS - Unmanned Aerial System.

METAR - Aviation Weather Report.

VLOS - Visual line of sight. Part 107 requires PICs to fly their UAS within visual line of sight. Binoculars and other devices to extend vision are not allowed. Two way radio communications are accepted.

sUAS – Small Unmanned Aerial System(s)