WEBER COUNTY SEARCH & RESCUE

Place your team emblem here.

Weber County SAR

Your team name.

Small Unmanned Aircraft System (sUAS)

Standard Operating Procedures

Revised: November 08, 2023

WCSAR DRONE TEAM

Place your drone team emblem here if you have one.

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Preamble

The mission of the Small Unmanned Aircraft Systems (sUAS) program is to provide aerial support to enhance safety and efficiency to ____Your Team Name_____ ground personnel, pursuant to __Team Initials__'s mission and requirements. Unmanned aircraft shall be operated in a responsible manner consistent with __Team Initials__ policy, state laws, and federal rules and regulations; ensuring that the privacy rights of the people of __Your County Or Area__ are respected.

This document will define the missions, training requirements, command relationships, standardization, specific flight team responsibilities, duties, and the reporting requirements to which __Team Initials__ sUAS team members will adhere in order to operate and safely deploy unmanned aircraft.

This document is subject to change without notice. Team members must proactively stay current with any changes that may impact procedures. Our mission is to enhance safety and efficiency, and at no time will we fly if safety is jeopardized.

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I. Purpose and Scope

Replace with your AHJ as needed.

A. This policy establishes the authorized use and operational guidelines for small Unmanned Aircraft Systems (sUAS) within ____Your Team Name_____ (__Team Initials__). The sUAS program is a function of the individual and the Sheriff Department who are responsible for purchasing, maintaining, manning, operating, and storing sUASs, but with oversight advisory for compliance with regulations by the sUAS Team Coordinator.

B. This policy is designed to minimize risk to people, property, and aircraft during the operation of the sUAS while continuing to safeguard the right to privacy of all persons. It is further designed to keep the __Team Initials__ and its personnel from being subject to civil and criminal penalties for misuse of sUASs and remain in compliance with any reporting requirements.

C. This policy is created to ensure that __Team Initials__ employees and volunteers who operate and deploy sUAS assets are Remote Pilots in Command (RPIC) as defined by the Federal Aviation Administration (FAA) and have received training on the proper and safe operation of unmanned aircraft.

D. This policy will define the training and certifications necessary to operate and deploy unmanned aircraft and will establish guidelines and best practices for RPICs to follow in order to safely deploy sUAS assets.

E. At all times, the __Team Initials__ and its personnel shall comply with 14 CFR Parts 107, 117, and/or Certificate of Authorization, plus applicable portions of CFR 14 Parts 61 and 91; as well as any current COAs.

F. In the event of a conflict between FAA regulations, Utah Government Code, Weber Sheriffs' Department regulations, and any part of this policy or COA, the most restrictive will apply. However, the RPIC's emergency command authority will be honored and respected.

II. Definitions

A. **Aircraft.** A device that is used or intended to be used for flight in the air. This includes sUASs.

B. **Airworthiness Statement.** The Airworthiness of the sUAS is self-certified by the Remote Pilot in Command (RPIC) through a preflight inspection prior to flight.

C. **Certificate of Authorization (COA).** COA is an authorization issued by the Federal Aviation Administration (FAA) to a public operator for a sUAS. After a complete application is submitted, the FAA conducts an operational and technical review. If necessary, provisions or limitations may be imposed as part of the approval to ensure the sUAS can operate safely with other airspace users.

D. **Crew Member.** A person assigned to perform any aircraft related duty.

E. **Crew Resource Management (CRM).** The effective use of all available resources including human, hardware, and information resources and coordination in the use of those resources by the RPIC, Remote Pilot, Air Commander, Visual Observer and crew members.

F. **Flight Operations Area (FOA).** A defined perimeter/parameters to be determined based on the scope and type of the operation and a defined operational ceiling.

G. **First Person View (FPV).** The Remote Pilot is observing the flight solely through the sUAS's visual perspective.

H. **Flight Time.** The time commencing from when an aircraft moves under its own power for the purpose of flight and ending when the aircraft comes to rest after landing.

I. **Image.** Any capturing of sound waves, thermal, infrared, ultraviolet, visible light, or other electromagnetic waves, odor, or other conditions existing on or about real property in this state or an individual located on that property. Imagery may include data about people, organizations, events, incidents, or objects as well as metadata.

J. **National Airspace System (NAS).** Airspace inside the continental United States. It is further defined through air navigation facilities, equipment and services, airports or landing areas, aeronautical rules, regulations and procedures. There are two types of airspace within the NAS, controlled and uncontrolled. Operation of a sUAS in controlled airspace adds another layer of responsibilities and requirements that must be met to operate the sUAS.

K. **Night Flight.** Flight of a sUAS that occurs between the hours of one half hour after sunset and one half hour before sunrise. The time of sunset and sunrise are determined by the National Oceanic and Atmospheric Administration (NOAA), but 14 CFR Part 107 will allow sUAS operations to be conducted during civil twilight if the small unmanned aircraft has lighted anti-collision lighting visible for at least 3 statute miles.

L. **Sterile Cockpit Rule.** The requirement that only activities required for the safe operation of the Aircraft may be carried out while on mission in order to prevent accidents caused by distraction. For purposes of this document, the term refers to isolating the Flight Team, and the RPIC in particular, from non-essential distractions while operating the Aircraft.

M. **Unmanned Aircraft System/Vehicle (sUAS/UAS/UAV).** Refers to the unmanned aircraft system and all of the associated support equipment, control station, data links, telemetry, communications, and navigation equipment, etc., necessary to operate the unmanned aircraft. The aircraft's flight is controlled either autonomously by hardware within the sUAS or under the remote control of a Remote Pilot on the ground or in another ground vehicle and meets all requirements set out in 14 CFR Part 107.

N. **Visual Flight Rules (VFR).** The set of regulations under which a pilot operates an aircraft in weather conditions clear enough to allow the pilot to fly solely by visual reference.

O. **Visual Line of Sight (VLOS).** Direct visual contact with the aircraft sufficient to manage flight and meet separation and collision avoidance responsibilities.

P. **Beyond Visual Line of Sight (BVLOS).** Limited or prolonged flight where the pilot cannot visually see the aircraft. The RPIC must comply with all existing FAA regulations and/or waivers relating to BVLOS.

III. NIMS/ICS Organization Chart

A. **Organization.** The Weber County Sheriff's Office and the Weber County Sheriff's Search and Rescue organization follows the Federal Emergency Management Agency's standards. All emergency response missions follow the National Incident Management System (NIMS).

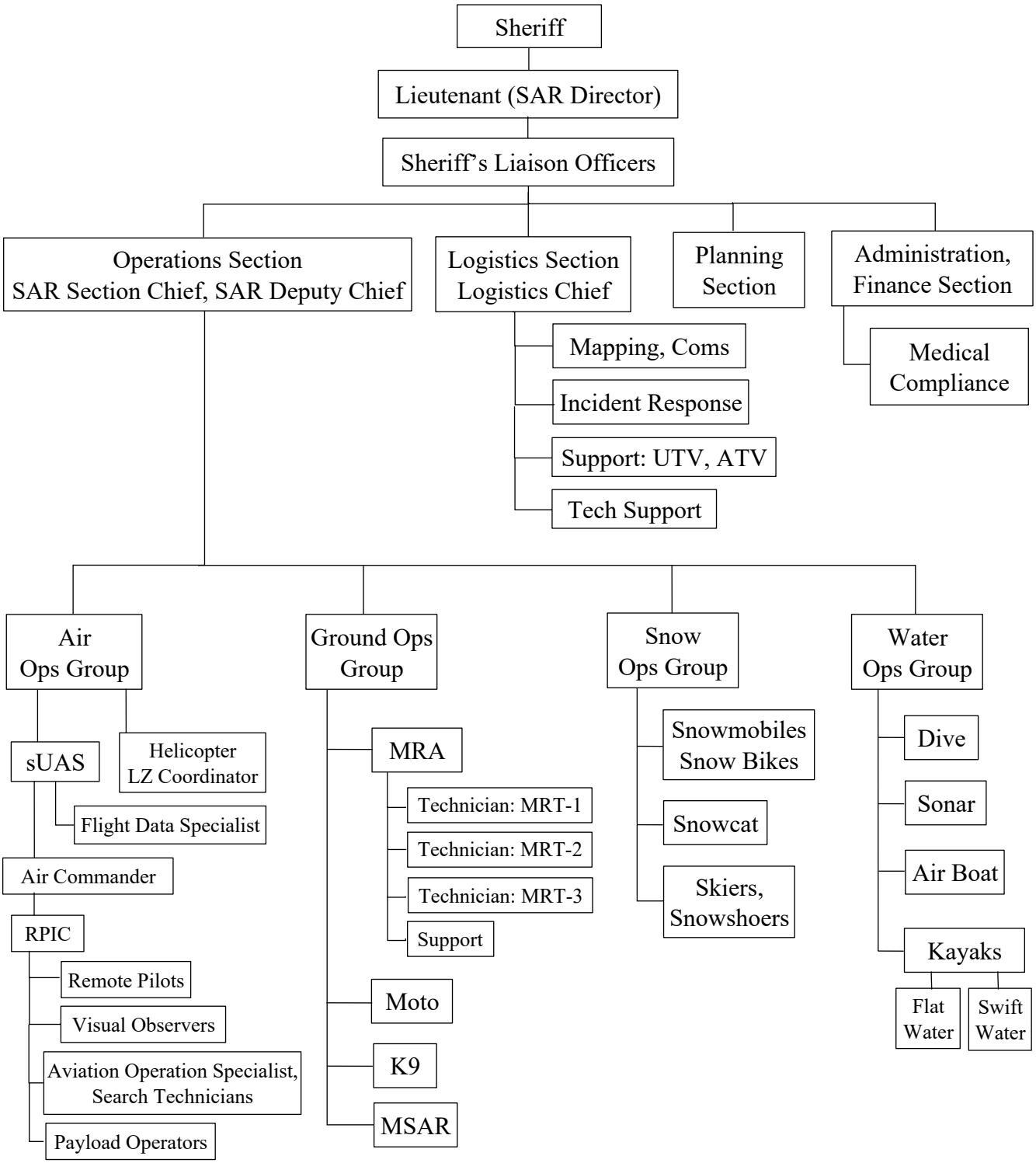
1. The National Incident Management System (NIMS) guides all levels of government, nongovernmental organizations and the private sector to work together to prevent, protect against, mitigate, respond to and recover from incidents. [FEMA.gov]

2. NIMS provides stakeholders across the whole community with the shared vocabulary, systems and processes to successfully deliver the capabilities described in the National Preparedness System. NIMS defines operational systems that guide how personnel work together during incidents. [FEMA.gov]

3. The NIMS defines a command structure known as the Incident Command System (ICS). All training, emergency response, or any mission conducted by the Weber County Sheriff's Search and Rescue will be organized, formally or informally, by following the ICS.

4. The Incident Command System (ICS) provides a standardized approach to the command, control, and coordination of emergency response. This all-hazards incident management concept is inherently flexible and scalable, accommodating a spectrum of incidents from the simple to the complex. The ICS organizational chart is dynamically responsive, expanding with additional roles in larger events and contracting to a streamlined hierarchy for smaller situations. Key roles such as the Incident Commander and essential section chiefs form the core of the structure, with the complexity of the chart reflecting the incident's demands. Uniquely modular, the ICS expands methodically from the top, with each position's responsibilities clearly defined, and unstaffed roles defaulting to the command of the next occupied position above that role, ensuring cohesive leadership and comprehensive incident management.

__Your Team Initials__ ICS Organizational Chart



Note on standard ICS titles: Section leaders are "chief" and "deputy chief." Group leaders are "Group Supervisor" (i.e., "Air Ops Supervisor", "Air Ops Deputy Supervisor"). A Strike Team is a specified combination of the same kind and type of resources with common communications and a "Team Leader." A Task Force is a combination of single resources assembled for a particular tactical need with common communications and a "Task Force Leader."

IV. Organizational Definitions—Chain of Command

A. **sUAS Chain of Command:**

1. SAR Director (Sheriff's Office Lieutenant and Liaison Officers)
2. Civilian Administration: Operations Section Chief and Deputy Chief
3. Air Operations Group Supervisor and Deputy Supervisor
4. sUAS Team Leaders (sUAS Team Coordinator)
5. Remote Pilot In Command (RPIC)
6. Flight Team ("Flight Task Force")

B. **Air Operations Group Supervisor** will:

1. Resolve conflicts or disputes that might arise related to policy or mission within __Team Initials__ as related to sUAS operations.
2. Establish protocols to prevent violations of policy, law, and public privacy.
3. Establish and maintain checklists for each phase of flight: Pre-flight, Take-off, Emergency Landing, and Post-flight.
4. Ensure checklists are up-to-date and current for each aircraft make and model.
5. Control the dissemination of any information produced by the sUAS team.
6. Ensure compliance with all reporting requirements as defined by government agencies.

C. **Flight Team (Flight Task Force).** Any combination of the RPIC, Remote Pilot(s), Visual Observer(s), Field Crew, and/or Air Commander. Flight Team Duties are outlined in Section VII.

D. **Remote Pilot.** The individual at the controls of the sUAS during flight. The Remote Pilot need not be 14 CFR 107 certified if the pilot is under the direct supervision of a certified RPIC who is in a position to immediately take over control of the sUAS.

E. **Remote Pilot in Command (RPIC).** The individual solely responsible for the overall flight operations for a specific mission. Each sUAS in use shall have its own RPIC assigned. An RPIC may also act as either Remote Pilot or Visual Observer. However, an RPIC may not delegate responsibility for the flight operations. An RPIC may only be assigned to one sUAS at a time.

F. **Visual Observer (VO).** The individual(s) assigned to maintain line-of-sight and 360-degree hazard awareness around the sUAS at all times and assist the RPIC in carrying out all duties

required for the safe operation of the sUAS. Under 14 CFR Part 107, VOs have no responsibility or authority over the sUAS operation. VOs may be formally trained and certified for special operations or they may be chosen ad hoc if properly briefed by the RPIC.

G. **Air Commander (ACOM).** The individual who directs all air operations for a given mission, however, this is not a required position on each mission. An ACOM is responsible for keeping the RPICs abreast of all relevant information and coordinates air search efforts. All command directives from incident command should go through the ACOM and then to the RPICs. The ACOM's objective is to isolate the pilots so that they can focus on maintaining a high level of safety as they operate the aircraft (Sterile Cockpit.) The ACOM should be designated by the sUAS Team Coordinator and assigned at the beginning of each mission. Air space deconfliction is the responsibility of the ACOM, including coordination and communication with any crewed aircraft such as helicopters.

H. **Flight Data Specialist.** The Flight Data Specialist maintains and archives all needed records including flight video, images, and flight data/telemetry (e.g., aircraft performance and flight paths), The Flight Data Specialist coordinates all analysis of data real-time or after the primary mission. The Flight Data Specialist ensures that live data feeds are functioning including online live video and that aircraft position information is received by the __Team Initials__ Logistics Section.

I. **Aviation Operations Specialist (AOS or "Field Crew").** The AOS is authorized to order any bystanders or team members to clear the area of flight operations including viewing large screen monitors, the landing zones, or interfering with the flight crew.

V. Flight Team Responsibilities and Duties

A. **Remote Pilot-in-Command (RPIC).** Duties include but are not limited to:

1. The RPIC is solely responsible for the safe operation of his/her aircraft.

2. Flight Operations—Operational Control—Remote Pilot-in-Command Authority. The RPIC shall initiate the flight only when confident the flight can be conducted safely.

3. The RPIC is authorized to refuse any flight request based on current meteorological conditions, physiological conditions, or for any other reason that the RPIC believes will affect the safety of the flight. Should the RPIC refuse a flight for any reason, they shall inform the incident commander or the ACOM, if assigned, as soon as possible of such refusal and the reason for refusal. The RPIC will have full support and is clear of any disciplinary action for a safety refusal.

4. While the sUAS is in flight, the RPIC is authorized and responsible for making all decisions regarding use of the sUAS including, but not limited to, direction of sUAS, duration of flight time, capabilities of the sUAS, and use of affixed certified equipment.

5. Checklists should be utilized according to the flow and verify method.

6. The RPIC is responsible for the safe conduct of all flights, including, but not limited to:

    i. Flight planning and preparation, including pre-flight checklist and inspections of sUAS and equipment.

    ii. Providing a weather briefing.

    iii. Flight operations, including course, air speed, altitude, and duration.

    iv. Landing zone selection.

    v. Go/no-go and landing judgments regarding weather or other criteria.

    vi. All Very High Frequency (VHF) air-to-air, air-to-ground, Air Traffic Control (ATC) communications, and any other radio communications.

    vii. Timely reporting of new or previously unknown hazards to safe flight encountered.

    viii. Post-flight inspection, to include assuring batteries are recharged and to ensure the duty aircraft is ready for the next mission.

    ix. After each deployment, maintaining and making appropriate entries in sUAS digital logbooks.

7. sUAS Inspections:

i. Before every flight, the RPIC is responsible for pre-flight inspections of the sUAS according to the pre-flight checklist, and manufacturer's recommendations.

ii. Any anomalies found by the RPIC shall be corrected before any flight is conducted.

iii. After every flight, a post-flight inspection shall be conducted by the RPIC according to the post-flight checklist and any manufacturer's recommendations.

B. **Visual Observer (VO).** Duties may include, but are not limited to:

1. Performing assignments as assigned by a RPIC;

2. Assisting the RPIC in the safe conduct of all flights, including but not limited to:

i. The VO shall assist in see-and-avoid operations of the sUAS. The Visual Observer shall remain in contact with the RPIC and communicate any obstacles the aircraft might encounter.

ii. If the flight becomes a hazard to ground personnel or other aircraft, the VO shall immediately notify the RPIC.

iii. During any phase of flight, if the Visual Observer notices a malfunction with the aircraft, he should immediately notify the RPIC.

C. **Air Commander (ACOM).** Duties may include, but are not limited to:

1. Acting as the sole interface between RPICs and incident command in order to facilitate, as nearly as possible, adherence to the "sterile cockpit rule".

2. Coordinating air search efforts, including passing on directives from incident command and designating the Flight Operations Area(s) and mission parameters in collaboration with assigned RPIC(s);

3. Supervising RPIC changeover and monitoring Flight Team health and fitness while on mission.

4. Notwithstanding anything in this section, RPICs retain command authority and responsibility over aircraft under their control. RPICs shall make good faith efforts to cooperate with directives from the ACOM. Specifically any RPIC can override directives from the ACOM for any operational safety issue that might arise.

D. **Helicopter Landing Zone (LZ) Coordinator.** Duties may include, but are not limited to:

1. Designating a safe LZ near the Incident Command Post.
2. Communicating with the helicopter pilot during approach and departure of the LZ.

E. **Remote Pilot.** Duties may include, but are not limited to:

1. Safe operation of the aircraft in compliance with all FAA regulations.

2. Coordination with the VO, RPIC, and other pilots as needed.
3. Gimbal and payload operation when there isn't a separate gimbal operator.

G. **Aviation Operations Specialist ("Field Crew").** Duties may include, but are not limited to:

1. Setup and dismantling of all flight support systems including:
   i. Large screen monitors and cabling such as HDMI cables.
   ii. Battery charging systems and supplying power via generators, etc.
   iii. Flight equipment tables for working on aircraft.
   iv. Assisting pilots with the setup and assembly of aircraft.
   v. Securing the area where the flight crew will be operating the aircraft.
   vi. Setting up and securing the landing zone including cones and landing pads.
   vii. Deploying flight crew headsets and/or other communications systems.
2. Maintaining a reliable battery supply chain. The AOS must anticipate the need for battery changes and have charged batteries ready at the LZ when an aircraft returns. Used batteries must be cooled efficiently and charged as quickly as possible.
3. Flight support equipment such as video relays must be monitored for battery status and ensure that a solid data link is maintained.
4. Pilot and crew health status must be monitored by the AOS. Make sure the crew are taking breaks, eating, drinking, and have a stable temperature/environment to work in. This might require setting up heaters, for example, so that pilots can operate without gloves if need be.
5. Maintain a "sterile cockpit." The AOS needs to insulate the flight crew from interruptions by curious bystanders and rescue team members. The AOS is authorized to order bystanders to clear the area as needed.
6. General troubleshooting of problems that might arise such as loss of data, loss of communications, large screen monitor failures, etc.

H. **sUAS Search Technician.** Duties may include, but are not limited to:

1. Live monitoring of video feeds (typically on larger monitors) for clues associated with the search operations.
2. Coordination with the pilots and/or gimbal operators to make sure that all areas are adequately searched.
3. Discuss flight plans with the pilots so that search goals can be optimized.
4. Coordination with the Aviation Operations Specialists and Flight Data Specialists to make sure all video feeds are robust and clear.
5. Search Technicians are authorized to order bystanders to clear the area if they are interfering with effective search operations or if sensitive information (e.g., deceased individuals) might unexpectedly appear on search screens.
6. Postflight review of video data as needed. This could be by visual means or by using advanced software for image analysis.

I. **The Flight Data Specialist (FDS).** Duties may include, but are not limited to:

1. Maintains and archives all needed records including flight video, images, and flight data/telemetry (e.g., aircraft performance and flight paths).
2. Ensures that all data are handled in accordance with department social media policies, including HIPAA privacy considerations.
3. Coordinates with pilots during missions to make sure that aircraft and/or remote controllers have memory cards installed before flight. Also, to make sure that pilots and/or payload operators remember to record flight video.
4. The FDS is responsible for making sure that live data is being uploaded to the Internet. The FDS must provide the URL or appropriate data access to field teams or others needing access to the live feed.
5. The FDS coordinates all analysis of data real-time or after the primary mission. The FDS coordinates with the Search Technicians to make sure any resources are available for data review. This includes access to image analysis software and/or training on the use of that software.
6. The FDS has ultimate responsibility that live data feeds are functioning including online live video and that aircraft position information is received by the __Team Initials__ Logistics Section. The FDS can request assistance from any available Aviation Operations Specialist and/or Search Technician to make sure this task is accomplished efficiently.
7. The FDS must ensure that media such as micro-SD cards are available in sufficient quantity to have memory cards in all aircraft and flight controllers as needed. This includes ensuring that there is adequate storage space for all flight video and data prior to any flight.
8. The FDS must transfer all flight data from memory cards to a more permanent data storage system after every mission. The memory cards must be cleared and returned to the aircraft in time for the next mission.

J. **Payload Operators (a.k.a. Gimbal Operators).** Duties may include, but are not limited to:

1. Operation of the secondary remote controller that controls the cameras and/or spotlight independently of aircraft control.
2. Coordinates between the search technicians and pilots to optimize all search operations.
3. The gimbal operator has ultimate responsibility for which cameras are prioritized (FPV, wide angle, zoom, and/or infrared) for search operations.
4. The gimbal operator must be ready at any moment for the pilot to take control of all cameras as needed for safe flight operation.
5. The gimbal operator must coordinate with the pilot to reduce interference of the view as maybe caused by rotors or landing gear. Again, flight safety always takes priority.
6. The payload operator has responsibility for all equipment used to deliver payloads to the field.
7. The payload operator must coordinate with the pilot regarding the release of payloads and in assisting with the flight stability of any payloads.
8. The payload operator must coordinate with the Visual Observers and all field teams to make sure that any payloads avoid ground personnel to the extent possible. This includes

the safe operation near the takeoff point at the command post. Any sUAS may become unstable when lifting a payload. The payload operator must make sure all unnecessary personnel are clear of the flight operations area.

9. The payload operator must coordinate with the RPIC to make sure that all payloads are within the operational limits of the aircraft as defined by the manufacturer.

IV. Missions

A. **Missions.** All missions will be flown in accordance with FAA regulations, 14 CFR Parts 107 and/or Certificate of Authorization, applicable portions of 14 CFR Parts 61 and 91, current FAA National Policy regarding sUAS Operational Approval, and Weber County SAR sUAS Team regulations relating to the operation of unmanned aircraft.

B. **Approved Uses/Missions.** All sUAS mission requests shall be authorized by the __Team Initials__ Director, or his/her designee. __Team Initials__ leadership will coordinate with the Air Operations Section Cheif to build a list of missions that will be considered for approval, such as but not limited to: aiding in search and rescue operations, crime scene photography, crash reconstruction, hazmat scene deployment, major disaster scenes, storm damage, fire scenes, tactical situations, communications tower inspections, public affairs events, maintenance, and training. Other case by case missions may be approved by the __Team Initials__ Director or his/her designee if those missions are immediately necessary to preserve the health, safety, and welfare of people or property within Weber County and State of Utah.

C. **Visual Flight Rules (VFR).** All flights with the sUAS shall be conducted under VFR conditions as established in FAA regulations. This requirement is superseded by any applicable FAA Certificate of Waiver or Authorization (COA) currently in effect.

D. **Weather and Flight Notice Briefing.** Weather should be obtained by the RPIC for the local area of operation to include Meteorological Aerodrome Reports (METAR) and Terminal Area Forecasts (TAF) from the closest airport reporting weather conditions if available and relevant. 1-800-WX BRIEF will provide a live briefer with access to this data if time permits. Review of Notice to Air Missions (NOTAMs) and Temporary Flight Restrictions (TFRs) are required prior to launch. Additional weather information can be obtained from the National Oceanic Atmospheric Administration (NOAA) (http://www.aviationweather.gov/adds/), or equivalent site or cell phone application to review the following: weather radar, ceiling/visibility, wind/temperatures, turbulence, Significant Meteorological Information (SIGMET), NOTAMs, TFRs, and icing. However, the RPIC has the authority by their own judgment to declare the weather within legal limits without METARS.

E. **Pre-Flight Briefing.** ACOM, RPIC, Remote Pilot, Visual Observer and any other Flight Task Force members must participate in the pre-flight briefing, led by the ACOM or RPIC prior to aircraft launch, which can include, but is not limited to:

1. Review of the mission's goals and expected outcomes.
2. Review of current and forecasted weather conditions.
3. Review of current Notice to Air Missions (NOTAMs) and Temporary Flight Restrictions (TFRs) that have been issued for the proposed flight area.
4. Identification of mission limitations and safety issues such as battery charge, GPS strength, and potential for radio interference.

5. Review of proposed Mission Fight Operations Area (FOA), including maximum ceiling and floor.

6. Review of communication procedures between RPIC, Visual Observer, and other personnel used to support the mission, including verifying cell phone numbers used to communicate with Air Traffic Control in the event of a fly-away or other flight emergency.

7. Review of emergency/contingency procedures including aircraft system failure, flight termination, divert, and lost link procedures.

8. Execution of a pre-flight check utilizing the approved checklist.

The RPIC will be responsible to ensure that the appropriate steps have been accomplished to the best of their ability and judgment prior to flight.

F. **Mission Debrief.** Following a mission, the RPIC shall debrief all missions to the Air Operations Supervisor. Also referred to as an After Action Report (AAR). Note: all flight task force members are encouraged to submit an AAR, especially if they have any personal concerns or observations about the mission.)

G. **Visual Line of Sight (VLOS).** Using vision that is unaided by any device (other than corrective lenses), the Remote Pilot in Command, the Visual Observer (if one is used), or the person manipulating the flight controller of the sUAS must be able to see the unmanned aircraft throughout the entire flight. Visual line of sight shall be maintained in order to know the unmanned aircraft's location and flight status (attitude, altitude, and direction of flight), observe the airspace for other air traffic or hazards, and to ensure that the unmanned aircraft does not endanger life or property. All Flight Team members essential to the operation of the unmanned aircraft shall be able to verbally communicate at all times.

H. **Preflight and Postflight Documentation.** __Team Initials__ flight equipment (aircraft and support equipment) check and weather should be documented by the RPIC in a digital logbook (e.g, Airdata) for all sUAS operations. After each flight or end of a duty cycle, the RPIC or designee will complete a digital flight log (e.g., Airdata) documenting the sUAS's operations.

I. **Maintenance.** Timely maintenance and accurate reporting is required to enhance mission availability and safety. Accurate UAV maintenance reporting is the responsibility of the Air Operations Group Supervisor in accordance with the manufacturer's recommendations. When maintenance is performed, a test flight shall be conducted in accordance with the manufacturer's instructions. UAV maintenance (including all firmware updates) must be current prior to mission launch. The RPIC will not fly any aircraft that he/she suspects does not meet airworthiness requirements following the preflight inspection.

J. **Payloads.** Any payload used on a sUAS shall be approved by the Air Operations Group Supervisor or, under exigent circumstances, the RPIC. Payloads shall comply with FAA regulations. Use of nonstandard payloads shall be reported to the Air Operations Group

Supervisor for informational purposes. Aircraft and payload performance notes should be included in both the digital logbook and the AAR.

K. **Night Flights.** Due to the prevalence of mountainous terrain in our county, night flights should be conducted with thermal cameras on board. If the mission does not involve mountainous terrain, night flights may be conducted with approved sUAS's equipped with spotlights, complying with all 14 CFR Part 107 regulations pertaining to night flight.

L. **Personal UAV.** All personal, non-__Team Initials__ UAVs must be approved for SAR operations by the Air Operations Group Supervisor or designee. All aircraft must meet FAA standards. Any personal UAVs must include an appropriate number of healthy batteries for the mission at hand.

VII. Training and Standardization

A. **Training Guidelines.** The Air Operations Group Supervisor shall review and approve a training curriculum (see VII. K. below for a possible curriculum) to assess the knowledge, skills, and abilities of RPICs, Pilots, Visual Observers and other sUAS team members. This can include requiring additional training and/or certifications to ensure satisfactory compliance with this policy. Only individuals listed on the official Team Roster will operate __Team Initials__ aircraft. The Air Operations Group Supervisor has final authority to determine if personnel are appropriate for the team. Anyone who feels that they have been unfairly blocked may request a review by the Operations Section Chief. The Operations Section Chief must consider the concerns of the Air Operations Group Supervisor before a final decision is made. In all cases, flight and mission safety must be the ultimate goal.

B. **Remote Pilot in Command (RPIC) training requirements.**

1. A RPIC may be authorized to operate more than one type of sUAS as long as he/she is trained and current in each individual model. The RPIC may only operate one sUAS at a time.

2. The RPIC shall show proficiency in basic aeronautical knowledge as it relates to the use and operation of sUAS assets. The basic aeronautical knowledge training, at a minimum, shall include:

   i. FAA rules pertaining to sUAS flight operational limitations.

   ii. All aspects of 14 CFR Part 107 including licensure.

   iii. Knowledge of the rules and responsibilities described in 14 CFR Part 91.

   iv. All aspects of Weber County SAR COA(s).

   v. Crew Resource Management.

   vi. Mission planning requirements for establishing the Mission FOA and Perimeter.

   vii. Mission briefing requirements to include approved checklists and manufacturer's recommendations.

   viii. Mission debriefing requirements.

3. The RPIC shall show proficiency in operating the specific sUAS model in flight, including emergency procedures. The RPIC's proficiency shall be evaluated by the sUAS Strike Team Coordinator or his/her designee who has mastered aeronautical knowledge and training as it pertains to the use of an unmanned aircraft.

4. The RPIC shall have Command ability to make life saving decisions. Included in the command ability the RPIC must show proficiency in communication and Crew Resource Management with the Flight Team members demonstrating satisfactory communications

between Team members. The RPIC's communications will be evaluated at all stages of the flight continuum: pre-flight inspection, flight operations, and post-flight procedures.

5. The RPIC shall demonstrate proficiency in all the technology and support equipment associated with any assigned mission to take advantage of the full capabilities of the sUAS. The RPIC's proficiency shall be evaluated by a sUAS Team Coordinator who has mastered aeronautical knowledge and training as it pertains to the use of unmanned aircraft.

6. Upon RPIC approval, the sUAS Team Coordinator shall inform the Air Operations Group Supervisor who will then inform the Operations Section Chief and __Team Initials__ Director of the approval. (Note, the sUAS Team Coordinator might be the same person as the Air Operations Group Supervisor.)

7. The RPIC must show that he/she has sufficient sUAS flight time to meet team experience standards, as determined by the sUAS Team Coordinator. This experience standard usually is accomplished with roughly a minimum of 30 documented flight hours.
    a. At least 10 hours must be at night including time spent looking for live subjects using an infrared camera.
    b. At least 1 hour must be in winds exceeding 20 knots.
    c. At least 2 hours must be in low light conditions such as deep twilight.
    d. At least 1 hour must be in adverse weather conditions such as light snow or rain. (This requirement can be suspended until such conditions are available.)

    e. The pilot must pass the team skills tests such as those defined below in this section.

9. Legal & Ethical Considerations: All RPICs must understand the privacy concerns of the citizens and visitors to Weber County. Pilots should make all reasonable efforts to avoid flights over private homes. Video and image capture of private properties should be avoided as much as reasonably possible. Any data collected on missions should be kept secure unless approved for public release by the sUAS Team Coordinator or higher authority.

C. **Visual Observer Training.** VOs should demonstrate basic knowledge of Part 107 regulations including basic operations of the sUAS being used. This demonstration can be accomplished and shown to the sUAS Team Coordinator at any of the team's scheduled training events. However, an RPIC has discretion to designate and properly brief any person to operate as VO for any particular mission.

D. **Helicopter Landing Zone (LZ) Coordinator.**

1. Complete the online training provided by the Mountain Rescue Association:
    a. Required: "Helicopters in Search and Rescue – Basic Level".
    b. Required: "Helicopters in Search and Rescue – Intermediate Level".
    c. Strongly encouraged: "Helicopters in Search and Rescue – Advanced Level".

2. Complete the __Team Initials__ team training with local helicopter agencies such as the Utah Division of Public Safety, Life Flight, University of Utah's AirMed, and MountainStar Healthcare's AirLife.
3. Receive training in radio communications with the helicopter pilot, especially in how to direct the helicopter to the LZ.
4. Provide evidence that you own PPE including eye protection, hearing protection, and a helmet.

E. **Air Commander (ACOM).**

1. Complete the FEMA online training courses: IS-700, ICS-100, ICS-200, and ICS-300.
2. Ideally, the ACOM should also complete ISC-400.
3. Demonstrate an understanding of the National Air Space (NAS) and:
   i. FAA rules pertaining to sUAS flight operational limitations.
   ii. All aspects of 14 CFR Part 107 including certification.
   iii. Knowledge of the rules and responsibilities described in 14 CFR Part 91.
   iv. All aspects of Weber County SAR COA(s).
   v. Crew Resource Management.
   vi. Mission planning requirements for establishing the Mission FOA and Perimeter.
   vii. Mission briefing requirements to include approved checklists and manufacturer's recommendations.
   viii. Mission debriefing requirements.
4. Ideally, the ACOM will be certified to 14 CFR Part 107 as a pilot, although this is not required.

F. **Remote Pilot.**

1. Demonstrate competency with each aircraft that the pilot is allowed to operate on actual missions.
2. Complete training on FAA rules regarding the flight operations of sUAS including flight operation limits.

G. **Aviation Operations Specialist (AOS or "Field Crew").** Complete training on:

1. Flight operation equipment setup and storage.
2. Battery management.
3. Installation of batteries into aircraft.
4. Operation and setup of support equipment such as generators, large screen monitors, data links, HDMI cables, etc.
5. How to maintain a "sterile cockpit."
6. Layout and setup of the landing zone area for the sUAS operations.

H. **sUAS Search Technician.** Complete training on:

1. Operation and setup of the large screen monitors and the associated connections needed to provide the live video data stream.
2. How to read the flight display, including:

i. How to read coordinates of the aircraft and laser range finder.
ii. Understanding the waypoint markers and home point marker.
iii. Understanding the compass rose including the heading of the aircraft and gimbal.
iv. Aircraft altitude indicator for both ASL and AGL relative to the home point.
v. Aircraft distance from the home point.

3. How to understand the infrared camera image and the advantages and disadvantages of the different color pallets.
4. What emissivity is and how it affects the infrared camera image.
5. Lost person behavior and search theory.
6. Map reading and understanding the display of whatever mapping software (e.g., SARTopo) is currently being used by Incident Command.
7. Situational Awareness of the location of field teams, the aircraft, and any information regarding the subject.
8. The concept that "search is an emergency" and the importance of efficient searching methods.
9. How to evaluate a subject's general condition once located.
10. How to use the available communications systems especially headsets used with the pilots.

I. **Flight Data Specialist.** Complete training on:

1. Current online data systems such as AirData and DroneSense.
2. How to maintain and backup all memory cards used by the aircraft and/or flight remote controllers.
3. How to setup and operate the data links feeding live data from the aircraft to the incident command post. How to coordinate with Logistics Section to make sure the feed is robust.
4. How to provide access to the live flight data feed. Specifically, how to get that information to command staff and field personnel.
5. Basic knowledge of image analysis software such as Loc8.
6. Understanding the roles and responsibilities of other team members such as the Aviation Operation Specialists and the Search Technicians.

J. **Payload Operator.** Complete training on:

1. How to install and inspect payloads such as cameras, spotlights, speakers, drop packages, etc.
2. How to operate the gimbal controls for each aircraft for which you are authorized to operate the remote controller.
3. How to coordinate between the pilot and the Search Technicians.
4. How to coordinate with the pilot to keep the aircraft landing gear and props out of the view of the cameras while also maintaining flight safety.
5. How to read the compass rose regarding the use of waypoints and the directions (azimuth and angle) of the aircraft and gimbal.
6. Basic search theory and lost person behavior.
7. Operation of the laser range finder if so equipped.

8. How to read the position of the aircraft.
9. Installation and operation of any payload release system.
10. How a payload impacts flight stability, especially the effect of line length and forward motion on the stability of the payload and aircraft.
11. Situational awareness of the location of ground personnel relative to the aircraft and payload. This includes the receiving personnel of the payload delivery.

K. **Training Curriculum.** Options and guidelines for a potential training curriculum. The Air Operations Group Supervisor must monitor the skills of the flight team. Anyone not demonstrating the required skill level can be required to complete all or sections of the curriculum below. The Air Operations Group Supervisor can also require all team members to demonstrate annual skill assessments selected from the list below or additional assessments as needs and technology change.

1. Basic flight skills:
   a. Precision flying such as the NIST UAS "Open Test Lanes". The pilot must be able to navigate through obstacle courses or follow specific flight paths with accuracy.
   b. Altitude control where the pilot demonstrates the ability to maintain a consistent altitude above the ground during searches, adapting to varying terrain.
   c. Stable hover and attitude control where the pilot holds a stable position while keeping the landing gear and rotors out of the view of gimbaled cameras, spotlights, or other direction sensitive payloads.
   d. Pilots must be able to set a waypoint to a location away from the home base and be able to fly to the waypoint.
   e. Remote Controller:
      i. Pilots must be able to operate special features of the aircraft they are checked out on such as laser range finding, infrared cameras, zoom cameras, gimbals, spotlights, speakers, etc.
      ii. Pilots must demonstrate a familiarity with the menu structures and settings of the aircraft they are authorized to operate. This includes menus such as IR color pallets, obstacle avoidance, lighting, etc.
   f. Pilots must be able to successfully complete simulated training missions that replicate real-world scenarios.
   g. Pilots must show proficiency with flight skills such as point of interest orbit, flying to a specific location that is visual pointed out by an examiner, and flying to a waypoint.
2. Night operations:
   a. Nighttime take-off and landing skills. Pilots must safely launch and retrieve the sUAS in low light and no light conditions.
   b. Pilots must show competency with thermal camera flight.
   c. Pilots must be able to control all on-board lighting systems including landing lights, spotlights, emergency lights (red/blues), and anti-collision lights.
3. Scenario-based Training.

a. Pilots must complete actual missions or training where they demonstrate their ability to locate lost individuals and/or clues such as clothing or gear “dropped” by a lost individual.
b. Pilots must practice assisting ground teams during night operations with lighting.
c. Pilots must practice route finding for ground teams attempting to reach or rescue a patient.

4. Aircraft Specific Knowledge: All fight team members must demonstrate that they can perform their duties on any aircraft that they are approved to work with. This includes controls, batteries, payloads, and a knowledge of the limitations of that aircraft.
5. Pre-flight Skills:
   a. Pilots must demonstrate how to obtain a LAANC authorization.
   b. Pilots must demonstrate that they know what agency to contact (and how) when needing flight authorization or to notify of a flyaway.
   c. Pilots must demonstrate how to connect to live data systems. Examples include AirData and DroneSense.
   d. Pilots must demonstrate how to conduct a thorough pre-flight inspection of airworthiness.
   e. Pilots must demonstrate how to use mission planning software such as placing waypoints and describing flight paths.
   f. Pilots must be able to demonstrate that they can unlock flight restrictions such as altitude limits as allowed by law and local policies.
   g. Pilots and Visual Observers must be able to demonstrate how to access the environment for potential risks like obstacles, electromagnetic interference, powerlines, and other hazards.
6. Emergency Response:
   a. Pilots must be able to both invoke and cancel a Return To Home (RTH) event.
   b. Pilots must be able to describe the procedures for an emergency landing in the field.
   c. Pilots must be able to demonstrate that they can safely avoid other aircraft in the NAS, expected or not.
   d. Pilots must be able to demonstrate what to do if the wind or weather changes. This includes being able to describe how winds can change near ridgelines and canyons. Pilots must be able to explain to an examiner what to do when caught in unexpected conditions.
   e. Pilots and Payload Operators must be able to change frequencies to maintain reliable datalinks to the aircraft and all payloads.
   f. Pilots must be able to describe how to perform an emergency shut-off.
7. Payloads and Accessories; Pilots and Payload Operators must be able to:
   a. Operate flight controllers set in gimbal mode (as opposed to flight mode) including the operation of all accessories such as cameras, spotlights, laser range finders, etc.
   b. Understand infrared (thermal) camera information and be able to recognize the heat signatures of humans, animals, rocks, trees, etc.
   c. Install and remove payloads without damage to the payload or aircraft.
   d. Payload release systems for the delivery of resources to field teams or a lost individual.
8. All flight team members must be able to demonstrate that they know how to set up flight operations as needed for their assignment and team position. This includes setting up

incident command for flight operations, battery management, data feeds to large screen monitors, and the set up of launch/landing zone.

VIII. Emergency/Abnormal Procedures

A. **Emergency Procedures.** Emergency Procedures stated in the manufacturer's operations manual should be followed for all sUAS operations. In the event of an emergency involving the safety of persons or property, the RPIC may deviate from the procedures of this directive relating to aircraft, equipment, and weather minimums to the extent required to meet the emergency.

B. **Lost Link**. An interruption or loss of command-and-control link with the sUAS such that the remote pilot can no longer manage the aircraft's flight and because of the loss of control the UA is not operating in a predictable or planned manner. The RPIC shall take whatever measure is needed to regain contact with the sUAS which may include, but is not limited to moving locations, or changing frequencies.

C. **Loss of sUAS Power (Engine Failure).** In case of an engine failure where the sUAS is unable to maintain flight, Flight Team members will immediately attempt to locate the sUAS, assess the scene for damage and injuries, and render first aid if necessary.

D. **Flight Termination.** The intentional and deliberate process of performing a Controlled Flight Into Terrain (CFIT). Flight Termination must be executed only if all other contingencies have been exhausted, and further flight of the aircraft cannot be safely achieved, or other potential hazards exist that require immediate discontinuation of flight.

E. **Accident Notification and Investigation:** The RPIC must Comply with Part 107 Regulations pertaining to accidents/incidents.

F. **Hazard Prioritization:** In all cases "life and well-being" shall be prioritized above "loss or damage to property."

IX. Team Roster

A. **The Team Roster** shall be maintained as a separate document. The Team Roster shall be easily accessible to all __Team Initials__ members for reference.

B. **Titles**. Titles shall be consistent with both the FAA and the FEMA naming structure as much as possible. Standard team positions include, but may not be limited to:

1. Air Operations Group Supervisor
2. Air Operations Group Deputy Supervisor
3. sUAS Team Coordinator (may be the same position as Group Supervisor)
4. Helicopter Landing Zone Coordinator
5. Air Commander
6. Remote Pilot
7. Aviation Operations Specialist (i.e., Field Crew)
8. sUAS Search Technician
9. Flight Data Specialist
10. Payload Operator (i.e., Gimbal Operator)

C. **Assignments.** Assignments are for general guidance based on training and skill levels. These assignments are primarily for the Incident Command Staff so they will know the skill levels of individuals on the sUAS team.

D. **Mission Assignments.** On missions, the RPIC has the authority to adjust assignments as needed to accomplish the mission.

E. **Team Members.** Team members can have multiple titles. For example, one member might be trained to be Air Commander, RPIC, pilot, and VO. This would indicate that this team member is skilled in these areas but not as a Flight Data Specialist or Aviation Operations Specialist. (Specifically, this member might have no training in how to set up the field support equipment at the flight operations center.)