



# **PSURT UAS Program Guide**

**Best practices for running a  
Public Safety UAS Program**

This document has been written to assist Jurisdictions regionally and statewide in developing UAS programs and response operations. These best practices are the result of collaborative efforts between several different organizations. It is intended that Jurisdictions adopt and incorporate these best practices into their UAS programs. This will assist in creating common program and response operation standards throughout the region and the state. Due to the nature of UAS technology and program advancements, this is a living / breathing document to be updated regularly and released by a joint committee as needed.

**AUVSI Top Program Certified:** Two Cedar Park sUAS pilots obtained their TOP 3 certification by using this manual as a basis for the theoretical portion of the requirements.

Contributors include:

#### **North Central Texas Council of Governments**

- Wayne Baker (Ret) - Joshua Fire Department
- Travis Calendine - Little Elm Office of Emergency Management
- Greg Cutler - Mansfield EM Office of Emergency Management

#### **Texas Gulf Coast Public Safety Unmanned Response Team**

- Brandon Karr – Pearland Police Department

#### **Capital Area Council of Governments**

- John Cummins - Cedar Park Office of Emergency Management
- Susan Minné - Cedar Park Office of Emergency Management
- Scott Mount - Williamson County Sheriff's Office
- Sontian Stinson - Austin Fire Department
- Jason Burnside - Austin Fire Department
- Coitt Kessler (Ret) - Austin Fire Department

#### **Contributing Agencies**

- Texas Department of Public Safety
- Texas Parks and Wildlife
- Texas Department of Emergency Management

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# Contents

Section 1: Introduction to Public Safety UAS Best Practices .....	1
1.1 Purpose.....	1
1.2 Scope.....	2
1.3 Governance and Oversight.....	2
1.4 Privacy .....	2
1.5 Transparency.....	3
Section 2: Acronyms and Definitions .....	4
2.1 Acronyms.....	4
2.2 Definitions .....	4
Section 3: Team Organization.....	9
3.1 Overview .....	9
3.2 PSURT Jurisdiction Aviation / UAS Coordinator .....	9
3.3 UAS Manager .....	10
3.4 UAS Team Leader (Air Boss).....	10
3.5 Landing Zone (LZ) Manager.....	11
3.6 Remote Pilot in Command (RPIC).....	11
3.7 Visual Observer (VO).....	11
3.8 UAS Data Specialist .....	11
3.9 Other Crew Members .....	12
Section 4: Flight Crew .....	13
4.1 RPIC Qualifications.....	13
4.2 Proficiency .....	13
4.3 VO Qualifications .....	13
4.4 Crew Resource Management.....	13
4.5 Crew Duty Day and Rest .....	14
4.6 Restrictions .....	14
Section 5: Aircraft Airworthiness and Maintenance .....	15
5.1 Airworthiness Certification .....	15
5.2 Maintenance Best practices .....	15
5.3 Configuration Control.....	16
5.4 Preflight Inspection .....	16
5.5 Payload Restrictions .....	16
5.6 Storage .....	16
Section 6: Aircraft Typing .....	17
6.1 Physical Characteristics.....	17
6.2 Operational Characteristics .....	17
Section 7: Airspace Authority .....	19

7.1 Authority Identification .....	19
7.2 Controlled Airspace .....	19
7.3 Uncontrolled Airspace.....	19
Section 8: UAS Operations .....	20
8.1 Prior to Flight .....	20
8.2 Safety of Flight.....	20
8.3 Critical Flight Phases .....	20
8.4 Night Operations.....	21
8.5 Operational Limitations .....	21
8.6 Point of Interest (POI) or Target Designation .....	22
8.7 Multi-Aircraft (UAS) Operations .....	22
8.8 Operations Documentation .....	23
8.9 Using Drone Detection Equipment .....	24
8.10 Operational Transparency .....	25
8.11 Observers During Scenario-Based Training.....	25
Section 9: Manned and Unmanned Joint Operations .....	26
9.1 Policy .....	26
9.2 Communications .....	26
9.3 Separation Assurance Standards.....	26
Section 10: Landing Sites and Recovery .....	28
10.1 Launch Site Selection .....	28
10.2 Primary and Alternate Landing Sites .....	28
10.3 Takeoff and Landing .....	29
10.4 Hazards .....	29
Section 11: Emergency/Contingency Procedures.....	30
11.1 Lost Link / GPS Procedures .....	30
11.2 Emergency or Fly-Away Procedures .....	30
11.3 Lost Sight.....	30
11.4 First Aid Kits and Training .....	30
Section 12: Communications.....	31
12.1 Introduction .....	31
12.2 Incident Communications .....	31
12.3 Radio System Decision Matrix.....	32
12.4 Texas State Interoperability Communications Plan.....	32
12.5 Radio Operations.....	35
12.6 Aircraft Call Signs .....	36
12.7 Communications Support Resources .....	36
Section 13: Data Management Best Practices.....	38
13.1 Data Collection .....	38

13.2 Data Retention .....	39
13.3 Dissemination .....	40
Section 14: Public Aircraft Operations (PAO) .....	41
14.1 Leasing of Aircraft.....	41
14.2 Government Function .....	41
Section 15: UAS and Law Enforcement.....	42
15.1 FAA Public Safety and Law Enforcement Toolkit.....	42
15.2 Law Enforcement Assistance Program (LEAP).....	42
Section 16: Use of Force Best Practices.....	43
Section 17: Safeguarding Privacy, Civil Rights, and Civil Liberties .....	44
17.1 Federal Grants.....	44
Section 18: Reporting Requirements .....	45
18.1 FAA Reporting Requirements.....	45
18.2 NTSB Reporting Requirements (49 CFR §830).....	47
Section 19: Training and Certification Process .....	48
19.1 Overview.....	48
19.2 Aircraft Type .....	48
19.3 UAS Proficiency Course .....	48
19.4 Certification Levels .....	48
19.5 Recertifying.....	50
19.6 PSURT UAS RPIC Certification Form.....	51
19.7 Existing Training Program .....	51
Section 20: Administering the PSURT Program at the COG Level .....	52
20.1 PSURT Database .....	52
20.2 Subject Matter Experts / Support Line.....	52
20.3 Waiver and COA Maintenance and Reporting .....	53
20.4 Program and Training Documentation.....	53
20.5 Equipment Scheduling and Maintenance.....	53
20.6 PSURT Program Administrator .....	53
Appendix A: Flight Checklist Example .....	54
Preflight.....	54
During Flight.....	55
Post Flight.....	55
Appendix B: Flight Team Leader (Air Boss) Checklist Example .....	57
Appendix C: Beaufort Wind Scale.....	58
Appendix D: Flight Hand Signals .....	59
Appendix E: Contingency Plan Checklist.....	60
Appendix F: Suggested Safety Equipment Checklist.....	61
Suggested Equipment .....	61

Appendix G: Mission Planning Profile .....	62
Appendix H: The NIST UAS Proficiency Course.....	63
Appendix I: Continuing Education .....	65
Purpose Statement .....	65
Training Resources.....	65
Associations.....	66
Appendix J: Training Form Examples .....	67
PSURT UAS RPIC Level 1 Checklist .....	67
PSURT UAS RPIC Level 2 Checklist .....	68
PSURT UAS RPIC Certification Form .....	69
PSURT UAS Visual Observer Checklist.....	70
PSURT UAS Visual Observer Certification Form .....	71
PSURT UAS Course Evaluation Form .....	72
Appendix K: UAS Modules and Packages (ICS Structure) Example.....	73
“Alpha – A” Package.....	73
“Bravo – B” package .....	73
“Charlie – C” package.....	73
“Delta – D” Package .....	74
PSURT Mission Ready Package.....	74
Appendix L: Manned / Unmanned Operations Agreement Example .....	76
Appendix M: UAS Presidential Memorandum.....	79
Appendix N: Texas Government Code 423: Use of Unmanned Aircraft.....	84
Code 423 Sec. 423.008 Report Examples .....	93
Appendix O: Special Government Interest (SGI) Submission Form Example.....	95

# Section 1: Introduction to Public Safety UAS Best Practices

**IMPORTANT:** This document complies with the National Incident Management System (NIMS). The information is recommended best practice and does not substitute for legal advice.

You should always follow your Jurisdiction guidelines, policies, and procedures. If your Jurisdiction does not have any policies, the information in this document can be used as a guide for creating a policy.

## 1.1 Purpose

The vision of the participating departments and agencies is to:

- Create baselines for emerging technologies and standards for integration into existing emergency response
- Establish coordination between private, public, local, and regional stakeholders to bridge the gaps in resource and capability sharing
- Increase situational awareness and aid incident command decisions at emergency scenes.

The mission of the PSURT is to mitigate real-world problems through a safe, coordinated effort using remotely operated air, ground, and maritime resources. Collectively, these teams are made up of individuals who operate under FAA Part 107 and/or Certificates of Authorization.

During operations, unmanned aircraft can be utilized by emergency management, firefighting, and law enforcement in circumstances that may save lives and/or property, as well as detect possible dangers to emergency crews that might not otherwise be seen. The increasing availability of low-cost small unmanned aircraft systems (UAS), together with image processing applications, real-time video, and various sensor payloads, provides an opportunity for Jurisdictions to:

- Collect forensic-quality scene information
- Provide infrastructure inspections and damage assessments
- Speed up incident clearance
- Assist in search and rescue
- Improve fire observation
- Reduce the exposure of law enforcement officers, emergency responders, and the public to hazardous conditions

This document establishes standard guidelines for the use of unmanned aircraft by participating departments or agencies, and for the collection, retention, and dissemination of images, video, and data captured by the unmanned aircraft.

**Note:** For the purposes of this document, “UAS” encompasses all unmanned aircraft systems operated by the participating departments or agencies.

## 1.2 Scope

Some of the typical missions for which UAS may be deployed are:

- Operational situational awareness through real-time video transmission, video recording, and aerial photography
- Perimeter and acreage calculation
- Incident perimeter maps (point, line, polygon data)
- Infrared inspection, mapping, and damage assessment
- Digital orthophotos (fire, HAZMAT, disaster area point of origin, structure triage, damage assessment)
- 3D models (terrain/infrastructure)
- Wildfires
- Pre-fire planning and post-fire investigation
- High-rise, commercial, and residential fire observation
- Search and rescue
- Accident and crime scenes
- Hazardous materials scenes
- Infrastructure Inspections
- Flood events / storm damage assessment
- Tactical situations
- Investigations
- Major disaster scenes

Jurisdictions may also respond to other requests for UAS service to preserve the health, safety, and welfare of people or property.

All missions shall be flown in accordance with 14 CFR Parts 61, 91, and 107, as applicable.

## 1.3 Governance and Oversight

Responsibility for the operation of a PSURT member is assigned to the PSURT member's Department Head or their designee.

The PSURT member's department head or their designee shall:

- Resolve conflicts or disputes that might arise related to policy or mission.
- Establish a protocol concerning the treatment of policy violations.
- Control the dissemination of any information produced by the PSURT member.
- Review and update department policies annually, as needed, taking into consideration recommendations by the PSURT, other interested parties, and changes in applicable law.

## 1.4 Privacy

Considering the diverse potential UAS uses in the National Airspace System (NAS), expected advancements in UAS technologies, and the anticipated increased unmanned aircraft use in the future, Jurisdictions shall make reasonable efforts to ensure that UAS privacy policies are periodically updated to keep pace with these developments.

The policies in this document help to ensure that safeguards and sanctions are in place to protect the privacy, civil rights, and civil liberties of all individuals, and other protected interests, including those of organizational entities, as well as to protect the integrity of PSURT member departments.

All UAS flights shall be compliant with the Texas Privacy Act HB 912 and Texas Government Code 423.

A Jurisdiction shall not intentionally use unmanned aircraft for the purpose of viewing, recording, or transmitting images and/or video in a criminal investigation or prosecution at any location or upon any property at which a person has a reasonable expectation of privacy unless one or more of the following is true:

- A warrant or court order has been approved for the search of the property
- A right-of-way has previously been established
- Consent by the owner or person responsible for the property is obtained



- Exigent circumstances exist, to include emergency response, active fire / search and rescue operations, and so on.

The deployment of unmanned aircraft due to exigency shall be authorized by the Jurisdiction UAS Coordinator (or designee), or other governmental agency making the request for the unmanned aircraft service, and the factual basis for such exigency shall be documented.

**Note:** For more information, see [Section 13: Data Management Best Practices](#), and [Appendix N: Texas Government Code 423: Use of Unmanned Aircraft](#).

## 1.5 Transparency

To promote transparency about unmanned aircraft activities, the department shall, while not revealing information that could reasonably be expected to compromise privacy, the public safety, or the safety of member agency personnel, or that may not be released pursuant to the Texas Public Information Act, the Texas Privacy Act HB 912, Texas Criminal Justice Records laws, or other Applicable Law:

- Provide reasonable notice to the public regarding areas all Jurisdiction unmanned aircraft are authorized to operate in the NAS.
- Make a reasonable effort to inform the public about the Jurisdiction UAS program, as well as changes expected to materially affect privacy, civil rights, or civil liberties.
- Provide upon request, a general summary of the Jurisdiction's unmanned aircraft operations during the previous calendar year, to include a brief description of types or categories of missions flown, and the number of times the Jurisdiction's team members provided aircraft services.

**Note:** For more information, see [Section 8.10 Operational Transparency](#).

## Section 2: Acronyms and Definitions

### 2.1 Acronyms

<b>AGL</b>	Above Ground Level	<b>NTSB</b>	National Transportation Safety Board
<b>ATC</b>	Air TrafficControl	<b>OPAREA</b>	Operational Area
<b>AHJ</b>	Authority Having Jurisdiction	<b>PAC</b>	Pilot at Controls
<b>BVLOS</b>	Beyond Visual Line of Sight	<b>PIC</b>	Pilot in Command
<b>CFR</b>	Code of Federal Regulations	<b>PSURT</b>	Public Safety Unmanned Response Team
<b>COA</b>	Certificate of Authorization	<b>RPIC</b>	Remote Pilot in Command
<b>CRM</b>	Crew Resource Management	<b>SGI</b>	Special Government Interest
<b>CS</b>	Control Station	<b>TFR</b>	Temporary Flight Restrictions
<b>FAA</b>	Federal Aviation Administration	<b>TRACON</b>	Terminal Radar Approach Control Facility
<b>FPV</b>	First Person View	<b>SOSC</b>	(FAA) System Operations Support Center
<b>GPS</b>	Global Positioning System	<b>sUAS</b>	Small Unmanned Aircraft System
<b>ILA</b>	Inter-Local Agreement	<b>UAS</b>	Unmanned Aircraft System
<b>LZ</b>	Landing Zone	<b>VFR</b>	Visual Flight Rules
<b>NAS</b>	National Airspace System	<b>VLOS</b>	Visual Line of Sight
<b>NOTAM</b>	Notice to Air Missions	<b>VO</b>	Visual Observer

### 2.2 Definitions

In addition to the acronyms defined in Section 2.1, and the terms defined elsewhere in this guide, the following definitions shall apply:

<b>Air Boss</b>	Represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident. In this document, this position is referred to as the UAS Team Leader.
<b>Altitude</b>	The height measured above an object such as above the underlying ground surface (AGL).
<b>Authority Having Jurisdiction</b>	An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, or a procedure.
<b>The Central Texas Robotic System Advisory Committee</b>	A group comprised of members of the Capital Area Council of Governance. The vision of the participating departments and agencies is to create baselines for emerging technologies and standards for integrating them into existing emergency response, establish coordination between private and public, local, and regional stakeholders to bridge the gaps in resource and capability sharing, and increase situational awareness and incident command decisions at emergency scenes. The mission is to mitigate real-world problems through a safe, coordinated effort using remotely operated air, ground, and maritime trained resources. Collectively, this team is made up of individuals who operate under FAA Part 107 and/or Certificates of Authorization.

<b>Certificate of Authorization (COA)</b>	An authorization issued by the Air Traffic Organization of the Federal Aviation Administration to a public operator for a specific unmanned aircraft activity.
<b>Civil Twilight</b>	The time periods between approximately 30 minutes before sunrise until sunrise, and between sunset and approximately 30 minutes after sunset.
<b>Controlled Airspace</b>	A generic term that covers the different classifications of airspace (Class A, B, C, D and E airspace) and defined dimensions within which ATC services is provided.
<b>Corrective Lenses</b>	Spectacles or contact lenses.
<b>Crew Leader</b>	Any person representing a UAS group from a participating agency in the regional UAS program.
<b>Crew Resource Management (CRM)</b>	A process designed to aid in the prevention of aviation accidents and incidents by improving performance through an understanding of human factor concepts, which focuses on interpersonal communication, leadership, and decision making by the flight crew.
<b>Critical Data</b>	Data that may be related to an investigation, involves a fatality, is part of critical government infrastructure, is related to an imminent threat to public safety, and/or has a potential terrorism or criminal nexus.
<b>Data Specialist</b>	A person who works with the RPIC to generate data required for strategic level planning, assessment, or decision-making.
<b>Defined Incident Perimeter (DIP)</b>	A defined perimeter to be determined based on the scope of the operation and applicable FAA requirements.
<b>Digital Electronic Management System (DEMS)</b>	A content management system (CMS) that centrally stores and manages all digital files. It allows an organization to control and centralize management of digital content or data.
<b>Digital Image</b>	A numeric representation (normally binary) of a two-dimensional image. Depending on whether the image resolution is fixed, it may be of vector or raster type. By itself, the term “digital image” usually refers to raster images or bitmapped images.
<b>External Hard Drive</b>	A portable storage device that can be attached to a computer through a USB or FireWire connection, or wirelessly. The devices typically have high storage capacities and are often used to back up computers or serve as a network drive.
<b>First Person View (FPV)</b>	A method used to control a radio-controlled aircraft from the RPIC’s viewpoint via an onboard camera, fed wirelessly to video goggles or a video monitor.
<b>First Responder</b>	Those individuals who, in the early stages of an incident, are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers as defined in section 2 of the Homeland Security Act of 2002 (6 U.S.C. 101)( includes Federal, State, and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities), as well as emergency management, public health, clinical care, public works, and other skilled support personnel (such as equipment operators) that provide immediate support services during prevention, response, and recovery operations.

<b>Geographical Area of Operation</b>	Either a physical description of a location or using GPS coordinates.
<b>Hard Drive</b>	A high-capacity, self-contained storage device containing a read-write mechanism plus one or more hard disks, inside a sealed unit.
<b>Horizontal Distance</b>	The physical measurement between two objects.
<b>Incident Commander</b>	The person who has overall responsibility for managing the incident by establishing objectives, planning strategies, and implementing tactics. The Incident Commander is the only position that is always staffed in ICS applications.
<b>Information</b>	Digital imagery (may include data in other mediums) recorded or transmitted by a UAS. Digital imagery may include data about people, organizations, events, incidents, or objects.
<b>Jurisdiction</b>	A range or sphere of authority. Public agencies have Jurisdiction at an incident related to their legal responsibilities and authority. Jurisdictional authority at an incident can be political or geographical (for example, city, county, tribal, State, or Federal boundary lines) or functional (for example, law enforcement and public health).
<b>Jurisdictional Agency</b>	The agency having Jurisdiction and responsibility for a specific geographical area or a mandated function.
<b>Landing Zone (LZ) Manager</b>	<p>The person who oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations.</p> <p>This position may also be referred to as the Pilot in Command (PIC) of the operation. When this occurs, the person at the controls is referred to as the Pilot at Controls (PAC).</p>
<b>Law</b>	As used in this document, includes any applicable local, state, tribal, territorial, or federal statute, ordinance, regulation, executive order, policy, or court rule, decision, or order, as construed by appropriate local, state, tribal, territorial, or federal officials or agencies.
<b>Memory Card</b>	(sometimes called a <i>flash memory card</i> or a <i>storage card</i> ) A small storage medium used to store data such as text, pictures, audio, and video for use on small, portable, or remote computing devices.
<b>Need to Know</b>	This is established when, because of Jurisdictional, organizational, or operational necessities, access to sensitive information is necessary for the conduct of an individual's official duties as part of an organization that has a right to know the information in the performance of a first responder, homeland security, or counter-terrorism activity.
<b>Night</b>	The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.
<b>Non-Critical Data</b>	Information gathered during the mission that is not deemed part of an investigation and does not involve a fatality.
<b>Nonparticipant</b>	Any person not associated with the UAS flight mission, including the public, spectators, and media.

<b>Person Manipulating the Controls</b>	A person other than the RPIC who is controlling the flight of a UAS under the supervision of the RPIC.
<b>Public</b>	<p>Includes:</p> <ul style="list-style-type: none"> <li>▪ Any person and any for-profit or nonprofit entity, organization, or association.</li> <li>▪ Any governmental entity for which there is no existing specific law authorizing access to the specified information.</li> <li>▪ Media organizations</li> <li>▪ Entities that seek, receive, or disseminate information for whatever reason, regardless of whether it is done with the intent of making a profit, and without distinction as to the nature or intent of those requesting information.</li> </ul> <p>Does not include:</p> <ul style="list-style-type: none"> <li>▪ People or entities, private or governmental, who have the legal authority to assist in emergency operations requested by an Authority Having Jurisdiction (AHJ) during an emergency or disaster event.</li> <li>▪ Public agencies whose authority to access information gathered and retained by the PSURT is specified in the law.</li> </ul>
<b>Remote Pilot in Command (RPIC)</b>	The department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.
<b>Right to Know</b>	This is established when, based on having legal authority or responsibility, or pursuant to an authorized agreement, an agency or organization is authorized to access sensitive information in the performance of a first responder, homeland security, or counter-terrorism activity.
<b>UAS</b>	<p>Unmanned Aircraft System and all associated support equipment, control station, data links, telemetry, communications, navigation equipment and so on, necessary to operate the unmanned aircraft.</p> <p>For the purposes of this document, “UAS” encompasses all unmanned aircraft systems operated by the participating departments or agencies.</p>
<b>UAS Manager</b>	The conduit between a UAS vendor (under federal contract/agreement) and an Incident Management Team (IMT).
<b>UAS Team Leader</b>	Represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident. This position may also be referred to as an Air Boss.
<b>Unmanned Aerial System (UAS)</b>	<p>Unmanned aerial system and all associated support equipment, control station, data links, telemetry, communications, navigation equipment and so on, necessary to operate the unmanned aircraft.</p> <p>For the purposes of this document, “UAS” encompasses all unmanned aircraft systems operated by the participating departments or agencies.</p>
<b>Small Unmanned Aerial System (sUAS)</b>	An unmanned aircraft weighing less than 55 pounds, including everything that is onboard or otherwise attached to the aircraft, and its associated elements (including communication links and the components that control the small UA)

that are required for the safe and efficient operation of the small UAS in the NAS.

For the purposes of this document, "UAS" encompasses all unmanned aerial systems operated by the participating departments or agencies.

**Vision Aides**

Binoculars, night vision devices and so on, used only for augmentation of visual observation duties.

**Visual Flight Rules (VFR)**

A set of regulations under which a RPIC operates an aircraft in weather conditions generally clear enough to allow the RPIC to see where the aircraft is going and any other aircraft in the vicinity. For UAS Team purposes, VFR requires a 3-statute mile visibility with operations conducted at least 500 feet below any clouds.

**Visual Line of Sight (VLOS)**

At all times the UAS shall remain close enough to the RPIC and the person manipulating the flight controls, or a Visual Observer, for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.

**Visual Observer (VO)**

A person acting as a flight crew member who assists the RPIC to see and avoid other air traffic or objects aloft or on the ground.

## Section 3: Team Organization

### 3.1 Overview

To maintain the span of control for any operation within the Incident Command System, it is important to have a scalable system that allows for the delegation of authority. This allows for a safer and smoother operation. The complexity of the data product and UAS operation drives the personnel requirement.

**Note:** For more information, see [Appendix K: UAS Modules and Packages \(ICS Structure\) Example](#).

A UAS flight crew may include, but is not limited to, the following positions:

<b>UAS Manager</b>	The conduit between a UAS vendor (under federal contract/agreement) and an Incident Management Team (IMT)
<b>UAS Team Leader</b>	Represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident. This position may also be referred to as an Air Boss.
<b>LZ Manager</b>	Oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations.  This position may also be referred to as the Pilot in Command (PIC) of the Operation. When this occurs, the person at the controls is referred to as the Pilot at Controls (PAC).
<b>RPIC</b>	The department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.
<b>Visual Observer</b>	Assists the RPIC and the person manipulating the flight controls to locate and avoid other air traffic or objects aloft or on the ground.
<b>Data Specialist</b>	Works with the RPIC to generate data required for strategic level planning, assessment, or decision-making.
<b>Other Crew Members</b>	Members who assist in the safe operation and maintenance of the UAS services.

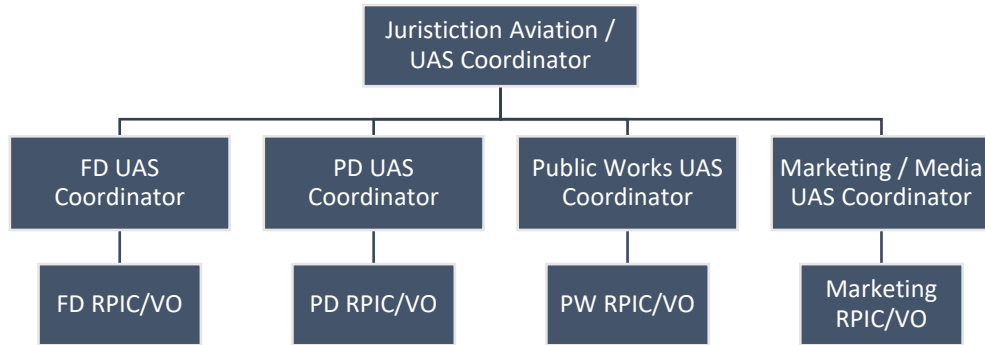
Each Jurisdiction is responsible for the selection and training of its crew members. Flight crews may be requested for mutual aid missions by other governmental agencies.

### 3.2 PSURT Jurisdiction Aviation / UAS Coordinator

The PSURT Jurisdiction Aviation / UAS Coordinator oversees all unmanned aircraft public safety program operations for the Jurisdiction. They may also coordinate training for commercial unmanned aircraft operations within other departments.

**Note:** For more information about administering the program, see [Section 20: Administering the PSURT Program at the COG Level](#).

### Jurisdiction UAS Management Chart



The UAS Coordinator responsibilities include, but are not limited to, the following:

- Ensure flight crews are compliant with all FAA requirements
- Maintain a current list of certified crew members
- Establish and develop departmental UAS Coordinators within the Jurisdiction
- Monitor and record the condition, maintenance, and flight records of all UA systems and associated equipment
- Perform monthly FAA reports and record management duties
- Maintain and update the Public Safety COA
- Ensure monthly flight skills and classroom training is completed by all RPIC in all departments

## 3.3 UAS Manager

The UAS Manager is the conduit between a UAS vendor (under federal contract/agreement) and an Incident Management Team (IMT). They are the designated government official (ACOR/PI) for the UAS contract/agreement and coordinate contract UAS operations with the air operations branch, planning section, participating aircraft, aerial supervision, and ground personnel.

This position is activated when contract UAS services are requested for an incident.

## 3.4 UAS Team Leader (Air Boss)

The UAS Team Leader (or designee) represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident.

**Note:** This position may also be referred to as the Air Boss.

The UAS Team Leader maintains an appropriate span of control for the team and provides a single point of contact for UAS operations/data processing to incident leadership in the field. A typical UAS team consists of at least one RPIC, one visual observer, one UAS Team Leader, and possibly a data specialist or LZ Manager.

The UAS Team Leader’s tactical responsibilities may include, but are not limited to, the following:

- Locate with Field Command to act as a liaison for the UAS branch.
- Receive mission assignments and forward those assignments to the RPIC’s or LZ Manager in the field.
- Contact the Jurisdiction Coordinator for additional UAS resources.



- When an LZ Manager is not on scene, manage takeoff / landing zones anytime there are three or more aircraft operating in the same airspace. In this case, the UAS Team Leader locates with the flight crew; not at Field Command.
- Manage airspace separation assurance standards between aircraft, to include both manned and unmanned operations.

**Note:** For a Flight Team Leader Checklist, see [Appendix B: Flight Team Leader \(Air Boss\) Checklist Example](#).

### 3.5 Landing Zone (LZ) Manager

The LZ Manager is a required position anytime there are three or more aircraft flying from the same landing/takeoff zone. The LZ Manager oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations. The LZ Manager receives mission assignments and assigns those missions to the appropriate RPIC's.

This position may sometimes be referred to as the Pilot in Command (PIC) of the Operation. When this occurs, the person at the controls is referred to as the Pilot at Controls (PAC).

### 3.6 Remote Pilot in Command (RPIC)

The RPIC is the department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.

The RPIC supports operations by providing real-time situational awareness in the form of electro-optical (daylight) or infrared video/still images. The RPIC is also trained to collect imagery and telemetry which can be processed into precise planning documents such as geo-referenced maps, orthomosaic photos, digital elevation models, or 3D terrain models.

The responsibility and authority of a RPIC is described in 14 CFR §91.3

The RPIC may rotate duties as necessary with equally qualified RPIC's and the agency member designated as RPIC may change during flight, as long as there is always one designated RPIC.

This person may also be referred to as the Pilot at Controls (PAC).

**Note:** For more information about the RPIC training and certification process, see [Section 19: Training and Certification Process](#).

### 3.7 Visual Observer (VO)

The Visual Observer assists the RPIC and the person manipulating the flight controls to locate and avoid other air traffic or objects aloft or on the ground.

**Note:** For more information about the Visual Observer training and certification process, see [Section 19: Training and Certification Process](#).

### 3.8 UAS Data Specialist

The UAS Data Specialist works as a team member with the RPIC to generate data required for strategic level planning, assessment, or decision-making. They may also work with the Geographic Information System Specialist (GISS) or Infrared Interpreter (IRIN) to generate required products.

The UAS Data Specialist specializes in the following:

- Performs preflight and post-flight safety and security checks of onboard data gathering and streaming equipment.
- Ensures that data recording and streaming equipment is operational preflight, during flight, and post-flight to achieve the mission objectives.
- Maintains the flow of streamed data to the receiver while the aircraft is in flight.
- Ensures that backup recording devices are operational before launch.
- Converts video, still, or telemetry data into either a pre-processed dataset or precision product such as geo-referenced maps, orthophotos, digital elevation models, or 3D terrain models.
- Checks recorded data, creates a backup copy, and forwards original to designated operations and planning authorities.
- Documents the chain of custody for information gathered from the aircraft.

On Regional UAS teams, each participating agency shall designate one crew member as the UAS Data Specialist. This position is responsible for maintaining any records or data obtained during UAS operations including UAS flight records, for directing third party requests for open records concerning a member agency to that agency, and for performing other similar duties as appropriate or needed.

If the mission relates to situational awareness, small scale acre/perimeter calculation, or aerial photos/video, a Data Specialist is not required.

**Note:** For more information about collection, retention, and dissemination of information, see [Section 13: Data Management Best Practices](#).

## 3.9 Other Crew Members

Other crew members include any other agency or department members who assist in the safe operation of the UAS services, including operating payloads.

## Section 4: Flight Crew

### 4.1 RPIC Qualifications

All RPIC's flying Jurisdictional missions shall be properly trained by either manufacturer representatives or instructors as designated by the Jurisdiction.

RPIC's shall meet all conditions of the FAA Part 107 certificate and/or COA and shall have a current working knowledge of the airspace intended for operations, LAANC, specific UAS aerodynamic factors, and the ability to obtain and interpret weather.

All RPIC's shall keep their flight logs current.

The minimum training and certification requirements for a RPIC are as follows:

- **Basic Flight Operations Training** – RPIC's shall successfully complete and pass basic flight operations training as approved by the Jurisdiction.
- **Part 107** – RPIC's shall obtain and keep current their FAA Part 107 Remote Pilot certificate. RPIC's shall have their certificate with them anytime they fly a mission.
- **Mission Training** – RPIC's shall undergo mission training to increase specific core competencies in all UAS operations, systems, and roles. This training is in addition to Basic Flight Operations Training.
- **Driver's License** – RPIC's shall have a valid driver's license.

### 4.2 Proficiency

It is recommended that a RPIC complete a minimum of 30 minutes flight training every month to maintain proficiency. Recurrent training includes hands on pilot/observer skills as well as knowledge of all pertinent UAS and aviation matters.

All members within the UAS flight crew operating under a COA shall read the current COA and maintain proficiency in their operator/observer abilities.

At a minimum, the RPIC shall attend two UAS trainings and conduct three takeoffs (launch) and three landings (recovery) with the specific UAS aircraft type within the previous 90 days prior to flying an operational mission. Members who do not have documented training or flight time for the preceding 90 days may be required to demonstrate proficiency before performing pilot/observer duties during a mission.

The RPIC shall pass an aeronautical knowledge test every 24 months.

Failure to maintain/prove proficiency may result in removal from UAS operations.

### 4.3 VO Qualifications

The minimum training and certification requirements for a VO are as follows:

- **Training** - Completion of a training course for the safe flight of aircraft, including the responsibilities described in 14 CFR Part 91 §91.111, §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary including standard ATC phraseology and communication.
- **Driver's License** – VOs shall have a valid driver's license.

### 4.4 Crew Resource Management

The Authority Having Jurisdiction (AHJ) shall confirm that CRM training is current for all participating crew members before flying operational or training missions.

The CRM training consists of initial training as well as CRM recurrent training during every recurrent training cycle, not to exceed a 12-month interval between initial training and recurrent training or between subsequent recurrent training sessions.

## 4.5 Crew Duty Day and Rest

The flight time and duty time limitations presented herein are maximum times. Many factors may affect whether a crewmember is rested enough to conduct flight duties. A remote pilot in command is expected to carefully evaluate their ability to safely conduct a flight and to not continue flight operations when they are excessively fatigued. As the primary consideration in doing a self-evaluation, the remote pilot in command shall base their decision on safety of flight issues rather than exigency of the flight mission.

### 4.5.1 Duty Day

A duty day begins when a remote pilot first reports for duty following no less than eight consecutive hours of rest and ends twenty-three hours and fifty-nine minutes later.

- **Duty Time** is the time on duty during the duty day and does not include meal breaks nor off-duty time between the end of the workday and the time a pilot is “called out.”
- **Flight Time** is the actual flying time logged in a Flight Log.

### 4.5.2 Flight Time / Duty Time Limitations

No sUAS crewmember may operate a sUAS more than ten (10) hours of flight time during any one duty day.

No sUAS crewmember may operate more than six (6) hours of flight time between the hours of 2400 and 0800 during any one duty day.

No sUAS crewmember may continue to operate a sUAS after sixteen (16) duty hours during any one duty day nor may they continue to operate a sUAS after seventy-two (72) hours during any seven (7) consecutive duty days.

### 4.5.3 Crew Rest Exemption

The person in charge of the mission, or an appropriate designee, can exempt crew rest restrictions deemed necessary.

## 4.6 Restrictions

No person may serve as a RPIC, person manipulating the controls, VO, or other crew member if any of the following are true:

- They consumed any alcoholic beverage within the preceding eight hours.
- They are under the influence of alcohol.
- They have a blood alcohol concentration of 0.04 percent or greater.
- They are using a drug, whether prescription, over the counter, recreational, or illegal, that affects their ability to safely operate the aircraft and/or participate in the UAS operational mission.

It is the responsibility of the RPIC, person manipulating the controls, VO, or other crew member to determine whether they are unable to participate in a UAS operation. However, the Crew Leader and/or Incident Commander of the incident for which UAS services are provided, may require the RPIC, person manipulating the controls, VO, or other crew member to cease participation in a UAS operation for any reason.

# Section 5: Aircraft Airworthiness and Maintenance

## 5.1 Airworthiness Certification

The Authority Having Jurisdiction (AHJ) is responsible for determining that the aircraft used by its RPIC's are airworthy.

All aircraft shall be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in any applicable COA applications or Part 107 waivers.

## 5.2 Maintenance Best practices

All UAS should be maintained in compliance with the department's policy and the procedures established in the manufacturer's maintenance guide.

The purpose of a maintenance program is to maintain a high degree of airworthiness in order to conduct safe operations. The maintenance policy should include scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the aircraft and its components necessary for flight.

### 5.2.1 Maintenance Records

All scheduled and unscheduled maintenance, repair, modification, overhaul, or replacement of a system component should be documented and, at a minimum, include:

- A detailed description of the inspection or repair being performed
- The date of the inspection or repair
- Aircraft total time in service as well as time-in-service for components (for example, airframe, batteries, and so on)
- The name, title, and contact details of the person performing the maintenance

Maintenance records should be retrievable from either hard copy and/or electronic logbook format for future reference.

### 5.2.2 UAS Battery Care

Regular use of a good quality and healthy UAS battery cannot be overstated. The successful operation of a UAS is contingent on many aspects; however, many of the mechanical and electrical related failures can be attributed to poor battery health.

It is recommended that you replace all UAS lithium polymer batteries prior to 150 cycles or 30 total hours of flight operation.

- Do not expose the UAS batteries to excessive or prolonged heat.
- If possible, allow UAS batteries to cool to room temperature after each flight before charging.
- Fully charge and discharge the battery once every three months to maintain battery health.
- Do not use a battery expanded by heat or one that does not securely fit in the UAS. Batteries that do not securely fit in the UAS or have visible damage should be removed from service.
- Do not use a battery that has displayed any continuous warning notifications. Batteries displaying continuous warning notifications should be removed from service.
- Do not install or remove the battery from the UAS when the aircraft is turned on unless the aircraft is designed by the manufacturer for hot swapping of batteries.

### 5.2.3 Repairs and Functional Test Flights

Repairs should only be completed by authorized personnel or by the manufacturer. After a repair is conducted and prior to a mission flight, you should conduct a functional flight test of the repaired UAS consisting of several takeoffs and landings, and battery changes.

## 5.3 Configuration Control

A configuration control program shall be in place for hardware and/or software changes made to the UAS to ensure continued airworthiness.

Software changes to the aircraft and control station as well as hardware system changes are classified as major changes documented as part of the normal maintenance procedures.

Each aircraft that has a major change in software or hardware configuration shall be test flown on a test range to confirm the airworthiness of the aircraft.

## 5.4 Preflight Inspection

Before each flight, the RPIC shall inspect the aircraft to ensure that it is in a condition for safe operation, such as inspecting for equipment damage or malfunctions. The preflight inspection shall include a visual or functional check.

**Note:** For a detailed preflight inspection checklist, see [Appendix A: Flight Checklist Example](#).

## 5.5 Payload Restrictions

Any payload attached to the aircraft shall not adversely affect the flight characteristics or controllability of the aircraft. No aircraft may carry hazardous materials or weapons.

## 5.6 Storage

The AHJ shall store the aircraft in a controlled environment in accordance with manufacturer recommendations.

## Section 6: Aircraft Typing

### 6.1 Physical Characteristics

Unmanned aircraft are built in a multitude of configurations which makes classification difficult. For emergency response, the classification below applies. Note that certain aircraft are specialized and do not fit this classification.

Contracted aircraft sensors are determined by the contract specifications.

#### 6.1.1 Fixed Wing

Type	Endurance	Data Collection Altitude (AGL)	Equipped Weight (lbs)	Typical Sensors
1	6-24 hrs	3,000 – 5,000'	>55	EO/IR/Multi-Spectral, Lidar
2	1-6 hrs	1,200 – 3,000'	15-55	EO/IR/Multi-Spectral, Lidar
3	20-60 min	400 – 1,200'	5-14	EO/IR Video and Stills
4	Up to 30 min	400 – 1,200'	<5	EO/IR Video and stills

#### 6.1.2 Rotorcraft

Type	Endurance	Data Collection Altitude (AGL)	Equipped Weight (lbs)	Typical Sensors
1	>60 min	400 – 1,200'	15-55	EO/IR/Multi-Spectral, Lidar
2	20-60 min	400 – 1,200'	15-55	EO/IR/Multi-Spectral, Lidar
3	20-60 min	<400'	5-14	EO/IR Video and Stills
4	Up to 20 min	<400'	<5	EO/IR Video and stills

### 6.2 Operational Characteristics

#### 6.2.1 Type 1 and 2

- These aircraft are generally operated by contractors and provide strategic situational awareness (SA) and incident mapping
- Fixed wing aircraft typically operate above all other incident aircraft
- Communications are maintained with the UAS crew on the assigned Victor (AM) or air to ground (FM) frequencies
- Contract fixed wing aircraft shall be equipped with Mode C transponders
- Typical aircraft are the Scan Eagle, Aerosonde, or MLB Superbat
- Typical rotorcraft include, but are not limited to, the DJI M600

#### 6.2.2 Type 3 and 4

- These aircraft are generally agency operated and perform tactical SA or mapping missions
- The aircraft are carried and flown on the emergency scene at relatively low levels (+/- 200' AGL)

- Communications are maintained with the UAS crew on the assigned air-to-ground (FM) frequency with the UAS Operator.
- Most do not carry transponders or AFF equipment
- Typical aircraft include, but are not limited to, DJI Mavic, DJI Inspire series, DJI Phantom series, and the DJI M100, M200, and M210.

### 6.2.3 Sensor Payloads

Sensor payloads are variable but typically include daylight (electro-optical), thermal, or mapping cameras. Type 1 and 2 aircraft may carry multiple camera types in a gimbaled configuration.



## Section 7: Airspace Authority

### 7.1 Authority Identification

As governmental entities, member agencies may choose to operate under the Small UAS Rule, 14 CFR Part 107 ("Part 107"), or conduct public aircraft operations under a blanket or Jurisdictional COA.

The RPIC determines the appropriate airspace authority for each flight operation based on the type of airspace, time of day, and any other pertinent circumstances.

The RPIC, VO, and crew members follow the rules of the chosen airspace authority, including any approved waivers, for each operation.

The RPIC shall declare whether they are flying under Part 107 or COA prior to beginning the flight.

### 7.2 Controlled Airspace

Operations in Class B, Class C, or Class D airspace, or within the lateral boundaries of the surface Class E airspace designated for an airport, are not allowed unless prior authorization is received from LAANC or FAA System Operations Support Center (SOSC).

#### **FAA System Operations Support Center (SOSC)**

Contact number: 202.267.8276

Email Address: [9-ATOR-HQ-SOSC@faa.gov](mailto:9-ATOR-HQ-SOSC@faa.gov)

When operating in controlled airspace, the RPIC shall be aware of all traffic patterns and approach corridors to runways and landing areas.

The RPIC shall avoid operating anywhere that the presence of the UAS may interfere with the operations at the airport, such as approach corridors, taxiways, runways, or helipads

The RPIC shall yield right-of-way to all other aircraft, including aircraft operating on the surface of the airport.

### 7.3 Uncontrolled Airspace

Operations in uncontrolled (Class G) airspace may be conducted without permission.

## Section 8: UAS Operations

### 8.1 Prior to Flight

The RPIC shall assess the operating environment. The safety risk assessment shall include the following:

- Local weather conditions
- Local airspace and any flight restrictions
- The location of persons and property on the surface
- Other ground hazards

**Note:** For information about how wind speed relates to observed conditions, see [Appendix C: Beaufort Wind Scale](#). For more information about airspace, see [Section 7: Airspace Authority](#).

The RPIC shall conduct a pre-takeoff briefing as applicable prior to each launch. The briefing shall include, but is not limited to:

- The contents of any applicable COA or Part 107 waiver
- Altitudes to be flown
- Mission overview including handoff procedures
- Frequencies to be used
- Flight time, including reserve fuel requirements
- Contingency procedures to include lost link, divert, and flight termination
- Emergency procedures
- Roles and responsibilities of each person involved in the operation
- Hazards unique to the flight being flown

**Note:** For a detailed preflight inspection checklist, see [Appendix A: Flight Checklist Example](#).

The RPIC shall ensure all necessary documentation is available for inspection, including their Part 107 Remote Pilot certificate, aircraft registration (if required), and COA (if applicable).

### 8.2 Safety of Flight

- All RPIC's are responsible for halting or canceling UAS activity if, at any time, the safety of persons or property on the ground or in the air may be jeopardized.
- Any VO responsible for performing see-and-avoid requirements for the UAS shall have and maintain effective communications with the RPIC.
- The use of multiple successive VOs (daisy chaining) is allowed as long as all VO's have effective communication with the person manipulating the controls.

### 8.3 Critical Flight Phases

Critical phases of flight include all ground operations involving:

- Taxi (movement of fixed wing aircraft under its own power on the surface of an LZ)
- Take-off and landing (launch or recovery)

- All other flight operations in which safety or mission accomplishment might be compromised by distractions

If any distractions occur during critical phases of the flight operation, the flight shall be aborted until the distractions can be appropriately mitigated.

During a critical phase of flight, crew members may only perform duties required for the safe operation of the aircraft.

No crew member may engage in, nor may any RPIC permit, any activity during a critical phase of flight which distracts any crew members from the performance of their duties or interferes in any way with the proper conduct of those duties.

The person at the controls and/or the RPIC shall not engage in any activity not directly related to the operation of the aircraft.

The use of cell phones or other electronic devices by crew members is restricted to communications pertinent to the operational control of the UAS.

## 8.4 Night Operations

Night flight is the period of time between the end of evening civil twilight and the beginning of morning civil twilight.

Except for Alaska, morning civil twilight is defined as the period of time that begins 30 minutes before official sunrise and ends at official sunrise, and evening civil twilight is defined as the period of time that begins at official sunset and ends 30 minutes after official sunset. The time of sunset and sunrise are determined by the National Oceanic and Atmospheric Administration (NOAA).

For flights during twilight and at night, the sUAS must be equipped with lighted anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision to comply with 14 CFR §107.29. The remote pilot in command may reduce the intensity of, but may not extinguish, the anti-collision lighting if they determine that, because of operating conditions, it would be in the interest of safety to do so.

For more information, refer to 14 CFR §107.29 Operation at Night.

Although not required by Part 107, having a Visual Observer for night flights is considered best practice.

## 8.5 Operational Limitations

- The UAS shall remain within VLOS of the RPIC and the person manipulating the controls. Alternatively, the UAS shall remain within VLOS of the Visual Observer.
- At all times, the UAS shall remain close enough to the RPIC and the person manipulating the controls, or the Visual Observer, for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
- Unless otherwise authorized as an FAA waiver, all operations shall be conducted in visual meteorological conditions (VMC) following visual flight rules (VFR) weather minimums.
- UAS may not operate over any person not directly participating (nonparticipants) in the operation.
- FPV cameras cannot satisfy the “see-and-avoid” requirement; however, they can be used if the requirement is satisfied in other ways.
- Operations may occur up to a maximum altitude of 400 feet AGL or, if higher than 400 AGL, remain within 400 feet of a structure unless otherwise approved by waiver.
- No person may act as a RPIC or VO for more than one UAS operation at one time.

## 8.6 Point of Interest (POI) or Target Designation

Locations of POI or targets shall be communicated using geographic areas of operation or GPS coordinates. GPS format is degrees and decimal minutes (DDM), **DDD° MM.MMM'**.

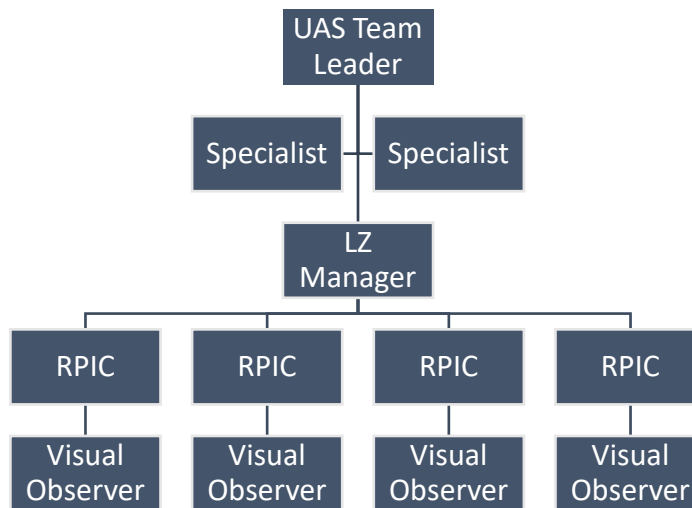
For example: 32° 18.385' N 122° 36.875' W.

Prior to the mission, confirm that all personnel are using the same or a compatible format.

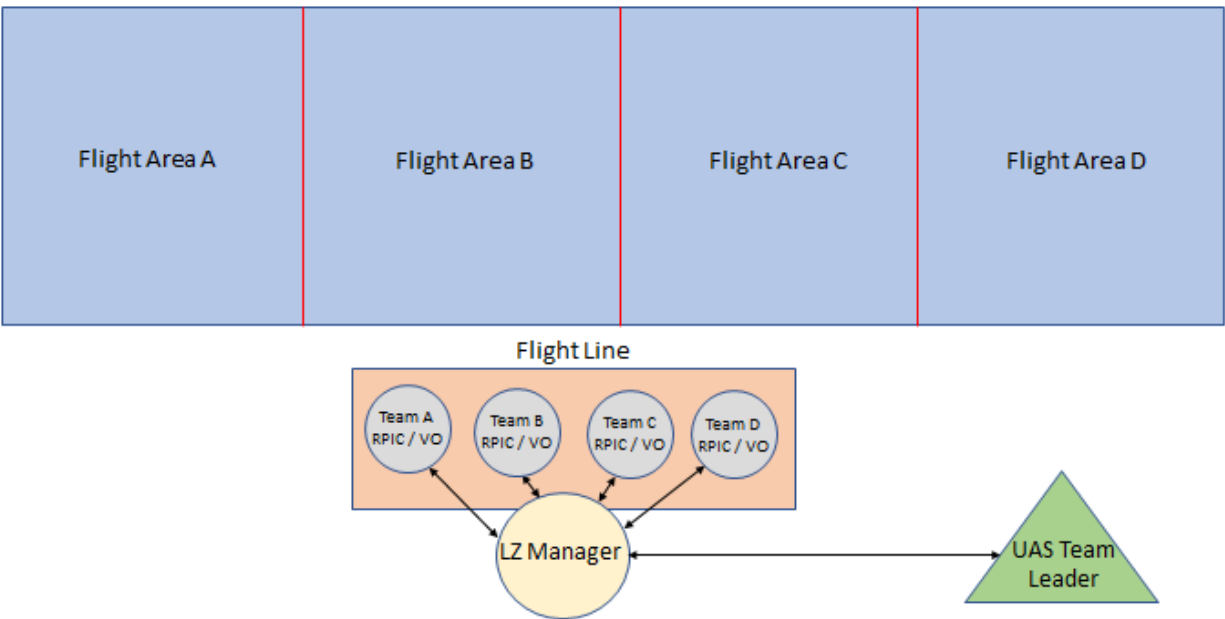
## 8.7 Multi-Aircraft (UAS) Operations

**Note:** This section covers multiple UAS flying from the same landing/takeoff zone. For joint operations with manned aircraft, see [Section 9: Manned and Unmanned Joint Operations](#).

When three or more aircraft are flying from the same landing/takeoff zone, a Landing Zone (LZ) manager and UAS Team Leader are required.



The LZ Manager stands on the flight line and is in direct contact with each RPIC/VO team so that they can react quickly to any situation. The LZ Manager is also in radio contact with the UAS Team Leader who is typically situated at the Command Post.

**Note:**

- For information about each position, see [Section 3: Team Organization](#).
- For a Flight Team Leader Checklist, see [Appendix B: Flight Team Leader \(Air Boss\) Checklist Example](#)

## 8.8 Operations Documentation

Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates.

### 8.8.1 Special Government Interest (SGI)

In controlled airspace outside of the AHJ, the RPIC or Coordinator shall obtain a waiver by filing a Special Government Interest (SGI) by contacting:

**FAA Systems Operations Support Center (SOSC)**

Contact number: 202.267.8276

Email Address: [9-ATOR-HQ-SOSC@faa.gov](mailto:9-ATOR-HQ-SOSC@faa.gov)

Provide the following information:

- Approval to conduct a UAS operation in <restricted airspace>.
- The name of the government agency and contact information for the person who has granted approval for the UAS operation.

The Systems Operations Support Center (SOSC) can be reached 24/7. The turnaround time for granting an SGI is ~30-60 minutes after the form has been received by SOSC. However, if the request is for a safety of life operation, or a law enforcement operation where the UAS needs to fly immediately, an SGI can be granted over the phone before all the paperwork has been processed.

**Note:** For more information, see [Appendix O: Special Government Interest \(SGI\) Submission Form Example](#).

### 8.8.2 Notice to Air Missions (NOTAM)

Prior to each sUAS mission, a NOTAM shall be filed by the RPIC or designee whenever flight operations are scheduled or required by a COA or waiver. It is recommended that the NOTAM includes only the actual hours and geographical area that you require for your mission. For example, if you require a 1-mile area from 9:00am to 10:00am, do not submit your NOTAM for a 5-mile area from 8:00am through 3:00pm.

A NOTAM may be accomplished by contacting the NOTAM Flight Service Station not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as an FAA waiver.

#### **NOTAM Flight Service Station**

Contact number: 1.877.487.6867

Website: <https://www.1800wxbrief.com/Website/#!/>

The issuing agency requires the following information:

- Name and address of the person filing the NOTAM request
- Location, altitude, or operating area
- Radial off nearest airport
- Time and nature of the activity
- COA number if operating under a COA

### 8.8.3 On-Scene Documentation

The UAS Coordinator shall ensure that the following documents are available at any deployment site:

- RPIC FAA Part 107 Remote Pilot certificates
- RPIC logbooks
- Copy of all waivers
- Copy of COA (if applicable)

### 8.8.4 RPIC Logbook

Every RPIC should keep a log of all flights – for training and deployment – that includes such information as:

- Date of flight
- Aircraft make and model
- Aircraft registration number
- Flight location
- Mission description
- Flight start time
- Duration of flight
- Maximum altitude

## 8.9 Using Drone Detection Equipment

It is highly recommended that you consult with your legal department before using any type of drone detection equipment.

## 8.10 Operational Transparency

Being transparent about UAS operations is critical to building trust with those affected by the deployment; therefore, the following protocols shall be implemented for all UAS deployments:

- When available, utilize flashing lights on all UAS to indicate operation and location in flight unless the Incident Commander (or designee) determines that it would jeopardize or compromise the deployment of the UAS in an incident involving an imminent threat to public safety.
- PSURT members shall identify themselves with an identification card that represents their qualification level.
- PSURT members shall wear clothing consistent with the identification of the department they represent.
- When possible, notification shall be made to residents in the immediate UAS operations area prior to deployment.

## 8.11 Observers During Scenario-Based Training

Observers shall receive a safety briefing that addresses the mission intent, non-interference with any mission personnel, and emergency procedures in the event of an incident or accident.

Observers shall be directed to, and contained within, a specific observation area that minimizes risk of injury and assures non-interference with the UAS training mission.

A flight crew member shall be designated to ensure that observers do not distract any mission personnel from the performance of their duties or interfere in any way with the proper conduct of those duties by engaging in conversations, discussions, interviews, or other distractions.

Flight Operations shall limit the number of observers to that which can be adequately monitored and protected by the personnel resources onsite.

## Section 9: Manned and Unmanned Joint Operations

**Note:** This section covers joint operations with manned aircraft. For multiple UAS flying from the same landing/takeoff zone, see [Section 8.7 Multi-Aircraft \(UAS\) Operations](#).

Factors commonly contributing towards airspace conflict for public safety manned and unmanned aircraft include notification of presence, lack of or poor communications, and lack of or inadequate policies, procedures, and training to support interoperability.

To ensure safe, coordinated, and effective response of aerial resources, an accountability system shall be implemented at all incidents where aircraft are utilized. The system is only effective if all participating agencies commit to it.

### 9.1 Policy

- Command will maintain resource accountability at all incidents.
- Incident Commanders are responsible for the notification to incident aircraft, tracking and documenting of responding unit response (to include aerial resources), and utilizing tactical worksheets and incident action plans.
- Manned aircraft take priority and have precedence over airspace.
- Both manned and unmanned resources shall establish and maintain communications.
- All aerial resources shall establish and maintain separation assurance standards through the demarcation of altitude, horizontal distance, and /or geographical areas of operation.
- Dispatch will announce UAS operations during incident response. UAS operations shall be communicated to manned aircraft at the time of the request.

**Note:** For an example of a manned / unmanned agreement, see [Appendix L: Manned / Unmanned Operations Agreement Example](#).

### 9.2 Communications

During both training and emergency incident response, radio communications shall be established and maintained between both the manned and unmanned aircraft.

Typically, all Air Operations communications (manned and unmanned) take place on the assigned Air Ops channel. For example, an Air Operations channel is assigned to emergency response incidents that occur within Travis County.

A second option is the air-to-air frequency of 123.025; however, this is not currently available on many department radios.

It is the responsibility of the RPIC to establish two-way communications with the manned aircraft. If two-way communications are unable to be established, the RPIC shall immediately land the sUAS and terminate operations until two-way communications are established.

### 9.3 Separation Assurance Standards

Operations may occur up to a maximum altitude of 400 feet AGL or, if higher than 400 AGL, remain within 400 feet of a structure unless otherwise approved by waiver. Most UAS operations take place at 200 feet AGL or below.



When working in joint airspace, safe separation of aircraft shall be maintained through altitude, horizontal distance, and /or geographical areas of operation such as using roads, rivers, or other natural dividing lines to deconflict the air space. The RPIC shall establish direct communication with the manned resource and develop the necessary separation clearances.

It is the responsibility of the RPIC to establish two-way communications with the manned aircraft. If two-way communications are unable to be established, and separation cannot be maintained, the RPIC shall immediately land the sUAS and terminate operations until two-way communications are established.

## Section 10: Landing Sites and Recovery

### 10.1 Launch Site Selection

Selection of a launch site shall be first and foremost driven by safety. Launch site selection is based upon:

- **Ability to maintain adequate buffer zones between aircraft and personnel** - Maintain a buffer of at least 25 feet for VTOL aircraft between aircraft operations and all non-essential personnel. Designate a Safety Officer to ensure the safety of the launch and recovery area.
- **Environmental Assessment** - No launches shall occur until all environmental assessments have been considered. The RPIC has the final authority to abort any launch based on hazards to the environment and/or personnel in the area.
- **Populated Areas** - Select a launch site that ensures aircraft departures are not in or overpopulated areas.

#### 10.1.1 Weather

The RPIC shall verify the weather conditions in the immediate area of operations using a local source of weather, the internet, phone application, or other appropriate method. The aircraft shall not be flown outside the weather minimums identified by the manufacture or an approved Certificate of Waiver/Authorization (COA) or FAA Part 107. The RPIC shall have final determination of risk due to weather and authority over any mission. Consider manufacturer's safe wind speed as well as operational necessity.

#### 10.1.2 Proximity to Controlled Airspace

Operations inside any controlled airspace shall only be performed after a notification is made through LAANC and, if necessary, by obtaining an SGI.

**Note:** For more information, see [Section 7: Airspace Authority](#).

### 10.2 Primary and Alternate Landing Sites

#### 10.2.1 Primary Landing Sites

Typically, the primary landing site shall be the same as the launch site. The RPIC has final authority for any approaches to the primary site and may wave off any approach deemed unsafe.

#### 10.2.2 Alternate Landing Sites

The RPIC shall designate at least one alternate landing site. If the primary landing site is deemed unsafe, procedures to utilize the secondary site shall be invoked.

#### 10.2.3 Mission Abort Sites

The RPIC may optionally designate an "abort site" whereby the aircraft may be "dumped" in an emergency. The abort site shall be so far removed as to provide absolute minimal risk should the aircraft be required to vacate airspace in an emergency. The aircraft may be flown to this site and landed without regard to the safety of the aircraft or flight equipment should the RPIC deem it necessary.

### 10.2.4 Landing Safety and Crowd Control

All landing sites shall be maintained and operated as the launch sites. Personnel shall maintain a buffer of at least 25 feet for VTOL aircraft between aircraft operations and all non-essential personnel.

## 10.3 Takeoff and Landing

Each RPIC shall utilize a separate launch/landing pad within the LZ for taking off and landing to reduce potential for collisions.

### 10.3.1 Takeoff

Prior to take off, program the aircraft to allow an appropriate return to home altitude.

**Note:** For more information, see [Section 11.1 Lost Link / GPS Procedures](#).

RPIC's shall obtain mission, altitude, and lift-off approval from the UAS Team Leader or LZ Manager before taking off. If no UAS Team Leader or LZ Manager is assigned, RPIC's shall coordinate operations together.

All Type III and Type IV rotary aircraft take off vertically until they reach 15 feet AGL at which time the RPIC shall verify that all controls are working correctly. After verification, maneuver the aircraft to the assigned altitude and proceed with the mission. Maintain a designated safe area of at least 25 feet between the aircraft and personnel during lift off.

### 10.3.2 Landing

When the aircraft is deployed to meet an approved mission task, it shall be recovered within the same general area, if possible.

If a UAS Team Leader or LZ Manager is assigned, RPIC's shall obtain permission to land before approaching the landing zone. If no UAS Team Leader or LZ Manager is assigned, RPIC's shall coordinate operations together.

All aircraft shall approach the landing site at the assigned altitude, maintain that altitude above landing point/pad, and then descend to 15 feet AGL. At 15 feet AGL, RPIC's shall hover the aircraft and verify all persons or obstructions are clear of landing pad. After it is determined that it is safe to land, the aircraft shall descend until on the landing pad.

## 10.4 Hazards

### 10.4.1 Hazards to the Public

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to the public. The RPIC shall have final determination of risk to the public and authority over the launch of the aircraft. In all cases, the aircraft shall not be flown over persons in violation of the FAA approved COA or Part 107.

### 10.4.2 Hazards to Property

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to any property in the area. The RPIC shall have final determination of risk to property and authority over the launch of the aircraft. In all cases, the aircraft shall not be flown over property in violation of the FAA approved COA or Part 107.

### 10.4.3 Hazards to Personnel

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to the personnel directly involved with the effort. The RPIC shall have final determination of risk and authority over the launch of the aircraft.

# Section 11: Emergency/Contingency Procedures

**Note:** For more information, see [Appendix E: Contingency Plan Checklist](#).

## 11.1 Lost Link / GPS Procedures

Lost link is an interruption or loss of the control link between the control station and the unmanned aircraft. This prevents control of the aircraft and results in the aircraft performing pre-set lost link procedures. While operating in controlled airspace, in the event of a lost link that cannot be re-established within a reasonable time, a designated crew member shall immediately notify the appropriate authority.

When possible, lost link and lost GPS procedures shall comply with the following:

- The aircraft autopilot will enter a lost link mode within 10 seconds of the lost link condition being detected, return to the LZ or other defined lost link waypoint within the UAS operating area, and land.
- If the aircraft loses GPS, the RPIC will immediately attempt to land the aircraft in a safe location by controlling it manually or landing at the current location within the operating area.
- If both GPS and data link are lost, the aircraft will automatically land at the current position.

## 11.2 Emergency or Fly-Away Procedures

In the event of a fly-away or other emergency scenario while operating in controlled airspace, the designated crew member shall immediately notify the appropriate authority and provide the following information:

- The nature of the emergency
- Last known aircraft position, altitude, and direction of flight
- Maximum remaining flight time

## 11.3 Lost Sight

If a VO loses sight of the aircraft, the VO shall immediately notify the RPIC. The RPIC shall place the aircraft into hover mode while the RPIC and VO try to reestablish visual contact with the aircraft. If the aircraft is visually reacquired promptly, the mission may continue. If visual contact is not reacquired within a reasonable period, the RPIC shall initiate the Return to Home sequence.

For operational necessity, the RPIC or person manipulating the controls may intentionally maneuver the UAS so that they lose sight of it for brief periods of time. In this case, the RPIC must regain VLOS as soon as practicable. For example, a RPIC stationed on the ground utilizing a UAS to inspect a rooftop may lose sight of the aircraft for brief periods while inspecting the farthest point of the roof. As another example, a RPIC conducting a search operation around a fire scene may briefly lose sight of the aircraft while it is temporarily behind a dense column of smoke.

However, it must be emphasized that even though the RPIC may briefly lose sight of the UAS, the RPIC always has the see-and-avoid responsibilities set out in Part 107, §§ 107.31 and 107.37. The circumstances of what would prevent a RPIC from fulfilling those responsibilities will vary, depending on factors such as the type of UAS, the operational environment, and distance between the RPIC and the UAS. For this reason, there is no specific time interval that interruption of VLOS is permissible, as it would have the effect of potentially allowing a hazardous interruption or prohibiting a reasonable one.

## 11.4 First Aid Kits and Training

Texas requires all firefighters to be EMT-Basic certified and all police officers to complete basic first aid training. It is recommended that a first aid kit is on-site at every mission location in case of injury.

## Section 12: Communications

### 12.1 Introduction

Every year, Central Texas public safety agencies and their utility partners and local / state agencies respond to medium to large scale incidents that range from moderate to high levels of complexity. During the responses, the one underlying parameter required before, during, and after, is the ability to communicate not only with the same agency resources but also requested and support based adjoining agencies.

This communication plan includes suggested guidelines and potential trigger points for larger incidents as well as incidents where multiple agencies and local cooperators come together as a force multiplier to benefit the Central Texas communities in large-scale multi-operational period disasters.

### 12.2 Incident Communications

Incident personnel assigned with the creation of communication plans should, as they see fit, continue to use the primary radio system that was assigned during the initial response of the incident. The ability to assign loaner radios that allow access to this system should be considered to avoid “patching” of radio systems. Patching of radio systems can lead to a delay in mission critical communications.

Systems that are currently available are as follows:

- GATTRS (VHF/800Mhz Smartzone Phase 1)
- 900Mhz (LCRA OpenSky P25)
- VHF (136-174 Public Safety Band)

Incident Command should select the most applicable system based on the complexity of the incident and needs. VHF within the state of Texas is the default system outside of the CAPCOG region in the rural surrounding areas. GATTRS provides the best information security over distance and common working picture.

During daily operations or a single incident, Agencies shall utilize their department assigned frequencies and radio systems. This reduces the loss of communication and helps to maintain span of control.

If additional adjoining resources arrive to assist and are deemed qualified, use of interoperability channels shall be utilized to maintain continuity of operations.

As an incident continues and has the potential for expansion, there may be a need to communicate with resources that do not operate within the same radio system. When this occurs, transition to the Texas State Interoperability Communications plan shall be considered.

If migration to this system becomes a clear and viable option, all parties on the incident engaged in UAS operations shall be notified of the intent to change the communications plan and advised of the frequencies within the band to monitor.

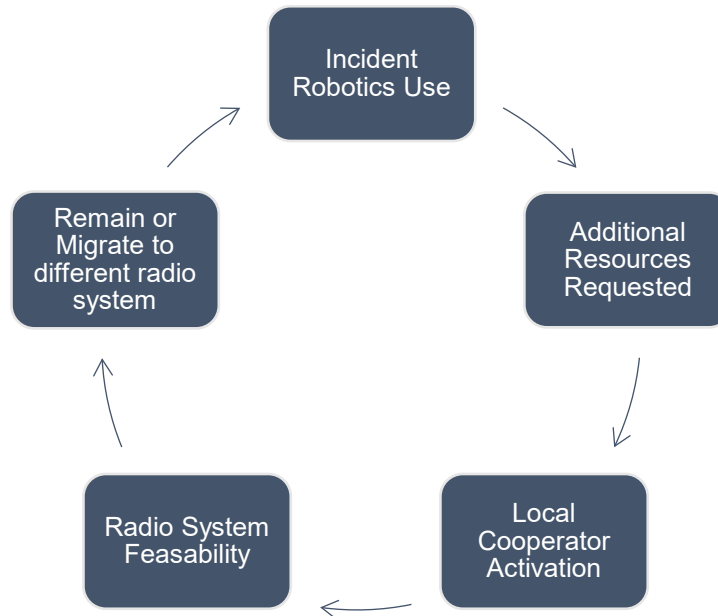
As additional resources are requested and arrive at the rendezvous point, the mission briefing shall include the applicable radio plan and frequencies (air to ground, inter-crew, and operations).

The activation and use of local volunteer resources (for example, Travis County ARES and Texas Military Forces communication branches) should be considered to extend the operational effectiveness and communication to command and to control functions of the incident.

Active partners within this group shall work with their respective organizations to ensure applicable radio frequencies are programmed within their radio system. Agencies that are not capable of direct system programming of these channels shall make this information known prior to deployment so that equipment can be supplied to maintain overall operational effectiveness.

## 12.3 Radio System Decision Matrix

The matrix below gives tangible decision points to consider for the Incident Command/Robotics Team Lead to consider before a potential radio system change within the incident.



## 12.4 Texas State Interoperability Communications Plan

In 2005, Texas adopted the SAFECOM standards and used the SAFECOM Interoperability Continuum as a tool to develop the TRCIP. The TRCIP was supplemented by the Texas Statewide Interoperability Channel Plan and a Channel Plan Memorandum of Understanding. The Channel Plan MOU establishes permissions and guidelines for the use of the designated interoperable/mutual aid radio channels.

### 12.4.1 VHF 150 MHz Simplex Interoperability Channels (12.5kHz)

Mobile and Portable Configuration					
Label	Receive	Transmit	Station Class	CTCSS RX /TX	Use
<b>VCALL10</b>	155.7525	155.7525	FBT / MO	156.7 / 156.7	Calling Channel
<b>VTAC11</b>	151.1375	151.1375	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VTAC12</b>	154.4525	154.4525	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VTAC13</b>	158.7375	158.7375	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VTAC14</b>	159.4725	159.4725	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VTAC17</b> <sup>1</sup>	161.8500	157.2500	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VTAC17D</b> <sup>2</sup>	161.8500	161.8500	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE21</b>	154.2800	154.2800	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE22</b>	154.2650	154.2650	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE23</b>	154.2950	154.2950	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE24</b>	154.2725	154.2725	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE25</b>	154.2875	154.2875	FBT / MO	156.7 / 156.7	Tactical Channel
<b>VFIRE26</b>	154.3025	154.3025	FBT / MO	156.7 / 156.7	Tactical Channel (Air-to-Ground with state/federal Aircraft ONLY)

Mobile and Portable Configuration					
Label	Receive	Transmit	Station Class	CTCSS RX /TX	Use
VMED28	155.3400	155.3400	FBT / MO	156.7 / 156.7	Tactical Channel (and for Air-to-Ground use)
VMED29	155.3475	155.3475	FBT / MO	156.7 / 156.7	Tactical Channel
VLAW31	155.4750	155.4750	FBT / MO	156.7 / 156.7	Tactical Channel
VLAW32	155.4825	155.4825	FBT / MO	156.7 / 156.7	Tactical Channel
TXCALL1D	154.9500	154.9500	FBT / MO	<b>156.7 / 156.7</b>	Mobile-to-Mobile Calling Channel
TXCALL2D	155.3700	155.3700	FBT / MO	<b>156.7 / 156.7</b>	Primary: Flight following between State and Federal aircraft. Secondary: Air-to-Ground for State/Federal Aircraft

<sup>1</sup> **Allowable use for VTAC17 and VTAC17D:** Base stations: 50 watts max, antenna HAAT 400 feet max. Mobile stations: 20 watts max, antenna HAAT 15 feet max. These channels are for tactical use and may not be operated on board aircraft in flight. These channels use narrowband FM and are available only in certain inland areas at least 100 miles from a major waterway. These channels use the same frequencies as VHF Marine channel 25, which uses wideband FM. Use only in authorized counties listed below. In these authorized areas, interoperability communications have priority over grandfathered public coast and public safety licensees.

<sup>2</sup> **VTAC17 and VTAC17D may ONLY be used in the following counties:** Andrews Armstrong Bailey Borden Brewster Briscoe Callahan Carson Castro Childress Cochran Coke Collingsworth Concho Cottle Crane Crockett Crosby Culberson Dallam Dawson Deaf Dickens Donley Ector Edwards El Paso Fisher Floyd Gaines Garza Glasscock Gray Hale Hall Hansford Hartley Haskell Hockley Howard Hudspeth Hutchinson Irion Jeff Davis Jones Kent Kimble King Kinney Knox Lamb Lipscomb Loving Lubbock Lynn Martin McCulloch Menard Midland Mitchell Moore Motley Nolan Ochiltree Oldham Parmer Pecos Potter Presidio Randall Reagan Reeves Roberts Runnels Schleicher Scurry Sherman Sterling Stonewall Sutton Swisher Taylor Terrell Terry Tom Green Upton Val Verde Ward Wheeler Winkler Yoakum (**extracted from the National Interoperability Field Operations Guide** <https://www.dhs.gov/national-interoperability-field-operations-guide>).

## 12.4.2 VHF 150 MHz Repeater Pair Interoperability Channel Configuration (12.5 kHz)

When assigning repeater channels, be aware that the VTAC33-38 repeater pairs are made up of various combinations of the simplex channels VTAC11, VTAC12, VTAC13 and VTAC14. Attention must be given to avoid assigning overlapping repeater channels and those simplex channels on the same incident or nearby incident.

CTCSS tone programming for VHF frequencies must be in compliance with the NIFOG version 1.6.1 and any subsequent revisions.

In an emergency, additional Department of Defense VHF Repeater Channels (below 150.8 MHz) can be made available through coordination with the Communications Coordination Group (CCG). Please contact the CCG through your local Disaster District Committee.

**Note:** The sub-audible tones of the following are different from simplex programming.

Mobile and Portable Configuration <sup>3 4</sup>					
Label	Receive	Transmit	Station Class	CTCSS RX /TX	Use
VTAC33	159.4725	151.1375	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Secondary 1</b>
VTAC34	158.7375	154.4525	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Secondary 2</b>
VTAC35	159.4725	158.7375	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Secondary 3</b>
VTAC36 <sup>5</sup>	151.1375	159.4725	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Preferred 1</b>
VTAC37	154.4525	158.7375	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Preferred 2</b>
VTAC38	158.7375	159.4725	FBT / MO	<b>156.7 / 136.5</b>	Tactical Repeater <b>Preferred 3</b>

Repeater / Base Configuration <sup>3 4</sup>					
Label	Receive	Transmit	Station Class	CTCSS RX /TX	Use
<b>VTAC33</b>	151.1375	159.4725	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Secondary 1</b>
<b>VTAC34</b>	154.4525	158.7375	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Secondary 2</b>
<b>VTAC35</b>	158.7375	159.4725	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Secondary 3</b>
<b>VTAC36 <sup>5</sup></b>	159.4725	151.1375	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Preferred 1</b>
<b>VTAC37</b>	158.7375	154.4525	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Preferred 2</b>
<b>VTAC38</b>	159.4725	158.7375	FB2T	<b>136.5 / 156.7</b>	Tactical Repeater <b>Preferred 3</b>

<sup>3</sup> VTAC33-38 recommended for deployable tactical repeater use only (FCC Station Class FB2T). VTAC36-38 are preferred;

<sup>4</sup> VTAC33-35 should be used only when necessary due to interference.

<sup>5</sup> VTAC36 repeater pair is the preferred repeater configuration for usage in Texas.

### 12.4.3 VHF Interop Channels and Programming Guidelines

Use of the VHF interop system has been found to be the most reliable and prudent based approach for all parties involved. After reviewing all agencies that may be involved, use of the VHF Interoperability plan within the State of Texas shall be utilized. This allows for all potential responding partners to quickly and effectively build a communications “net” that is supported and extended by local, state and federal agencies that may be or become involved within the scope of the incident.

Current state aviation assets can monitor and transmit on VHF band frequencies as equipment is already hard installed into the aircraft. This working group also is aware that law enforcement may need to utilize secured/encrypted frequencies to ensure the safety of their staff; however, efforts should be made to monitor group level channels as well as maintaining situational awareness.

### 12.4.4 The Texas Statewide Interoperability Channel Plan and Channel Plan MOU

The MOU requires agencies to:

- Participate in regional communications planning (generally arranged by Regional Council of Governments) that provides regional radio communications interoperability.
- Manage use of the interoperability frequencies by its employees, ensuring compliance with the Texas Statewide Interoperability Channel Plan and federal/state/local laws, ordinances, and rules.
- Use the interoperability frequencies authorized hereby for their intended purpose of coordination between emergency response agencies and resources. Such coordination may occur during interagency operations, en route travel, or at an incident.
- Use the interoperability frequencies for operational and en route communications in accordance with local and regional policies and procedures.
- Use the interoperability frequencies for on-incident communications in accordance with the Incident Communications Plan established by the on-scene Incident Commander.
- Prioritize the use of the interoperability frequencies:
  - Emergency or urgent operation involving imminent danger to life or property.
  - Disaster or extreme emergency operation requiring extensive interoperability and inter-agency communications.



- A special event, generally of a pre-planned nature.
- Joint training exercises inter-agency and en-route communications.
- Implement radio communications procedures consistent with the National Incident Management System (NIMS) and Incident Command System (ICS) including:
  - Use “plain language” without 10-codes or agency-specific codes/jargon.
  - Use the calling protocol: "Agency-Unit #, this is Agency-Unit #", rather than "Unit # to Unit #". Examples: "Bryan EMS 1605, this is Tyler Fire 2102" or "Incident Command, this is DPS 505"
  - Ensure that mobile, portable, and temporary base radios intended for use by agency leadership (officers) are configured with the appropriate in-band interoperability frequencies as found in the Texas Statewide Interoperability Channel Plan. This means that, at a minimum, the interoperable frequencies shall be added to the day-to-day frequencies used by that entity.

### 12.4.5 UAS Channels

Label	Receive	Transmit	Station Class	CTCSS RX/TX	Use
8TAC94D	853.0125	853.0125	FBT / MO	156.7 / 156.7	Tactical Channel (Direct) UAS Pilot to Pilot Coordination
7AG85D	774.11875	774.11875			UAS Pilot to Pilot Coordination
VTAC38	159.4725	158.7375	FB2T	136.5 / 156.7	Tactical Repeater Preferred 3
UTAC43D	453.8625	453.8625	FBT / MO	156.7 / 156.7	Tactical Repeater (Direct) UAS Pilot to Pilot Coordination
TXCALL1D	154.9500	154.9500	FBT / MO	156.7 / 156.7	Mobile-to-Mobile Calling Channel

## 12.5 Radio Operations

To better facilitate the rapid dissemination of information to all parties involved, the following guidelines shall be used to enhance effective and concise communications:

- UAS crews shall maintain the ability to monitor assigned radio frequencies.
- The VO shall oversee radio operations to allow the RPIC to concentrate on flight operations.
- UAS crews shall utilize clear speak over the radio to ensure the relayed information is understood. Use of 10-codes shall be limited.
- All UAS crews shall receive manned aircraft communications as a priority transmission and respond accordingly to minimize potential aircraft incursions.
- Imperial measurements shall be used to convey pertinent information (height, speed... and so on). For example, “Fairgrounds I.C Unmanned Rotor 3-1 is off the ground, on a heading of 340 degrees, 30 min of flight time, working altitude of 400 AGL, on an IR flight”.
- Prior to launching the UAS, a blind radio transmission shall be made to ensure all aircraft on the incident are aware of intent. Sufficient delay should be allowed for a response before taking off.
- After the UAS is airborne, the VO shall communicate with any aircraft in the air (speed, height, heading, total flight time, type of mission).
- Communication of GPS coordinates shall utilize the Decimal Degrees format. This allows for manned aviation to quickly input this information into flight computers to ascertain the location of UAS crews.

## 12.6 Aircraft Call Signs

RPIC's shall follow established incident communications protocols and make radio calls with the following information:

- Unmanned Aircraft
- Configuration (fixed or rotor-wing)
- Type
- Agency/Interagency assigned aircraftnumber

### 12.6.1 Call Sign Examples

- "Unmanned R41" (Rotor Wing, Type 4 UAS, Agency/Interagency #1)
- "Unmanned F12" (Fixed Wing, Type 1 UAS, Agency/Interagency #2)
- "Unmanned R23" (Rotor Wing, Type 2 UAS, Agency/Interagency#3)

## 12.7 Communications Support Resources

### 12.7.1 ARES

ARES is an organizational unit of the Amateur Radio Emergency Service ([ARES](#)), a part of the [ARRL](#). ARES groups can be created at the county level in each division and section of the ARRL. They consist of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes.

When an agency asks for communications assistance, it gets the full benefit of the entire ARES organization. The ARES infrastructure includes privately-owned radios, antennas, ARES-dedicated and cooperating repeaters, and accessory equipment.

Even more important than the equipment, the organizational structure includes numerous nets, training programs and exercises, and cooperative planning with agencies to learn their needs, and the services of scores of trained operators, few of whom are visible at the disaster site. The ARES field organization is designed to support as fully as possible, upon request, any and all emergency response and disaster relief organizations. In doing so, ARES retains its own identity and organizational structure, personnel, and physical infrastructure while providing communications support.

Officials of emergency and disaster response agencies who desire ARES assistance shall contact the closest ARES leader to the incident or disaster, usually an EC or DEC. The EC, or their designated representatives, are the only persons who may authorize the activation of the registered ARES members in their area. Officials may also contact the SEC, the Assistant SEC (ASEC) for Operations, or the Section Manager.

During critical events, amateur radio is being increasingly used as a "force multiplier" to extend limited public service resources even when existing communication systems are fully operational. For example, stationing amateur radio operators along a rising river to report gauge readings instead of stationing police resources, or using SKYWARN trained amateurs to qualify weather reports.

ARES leaders shall identify the communications needs and priorities of the served agencies and assign and direct ARES resources to address that need. ARES ECs and DEC's shall avoid accepting operating assignments so that they remain available to coordinate ARES resources.

### 12.7.2 Texas Military Forces (TXMF)

The TXMF serves as a supporting agency in State Hurricane Evacuation. The TXMF stands ready to deploy up to 10,000 personnel on short notice in support of the State as part of an ICS-centric Joint Inter-Agency Task Force (JIATF) in support of State emergency management plans. The TXMF serves as the focal point for coordinating and obtaining all Department of Defense assets that may be needed by the State, then coordinates the integration of those assets into the State response.

To be viable as a rapid responder for State emergencies, the TXMF has obtained relevant, interoperable communications equipment from federal funds for Base Support for the data network. As a result, required modernization of the data network that supports the deployable packages has been delayed; the network is in dire need of infrastructure modernization to continue to be able to support State needs during disasters. No State funds have been allocated or reimbursed to support this capability.

Current interoperable communications and satellite packages support the deployed National Guard Task Force(s) and other critical Inter-Agency command posts and emergency response forces as outlined in Annex N (Direction and Control) to the State Emergency Management Plan. This includes Area and Unified Commands such as the Disaster District Committees (DDCs), State Emergency Response Team (SERT), State Incident Command Posts (ICPs), Emergency Operations Centers (EOCs), Evacuation Hubs, and Evacuation Fuel Points, and so on.

Interoperable communications used by TXMF for state response include:

- Joint Operations Center (Austin, TX) - WEBEOC and full spectrum communications
- Task Force HQ Command Van (45') w/ VHF/UHF FM (non-P25) on Texas Statewide Interoperability Channel Plan, Aviation Radios, MSAT, Military Radios,
- Five Commercial Deployable Satellite Packages with high-speed data providing VOIP phones, data drops, a gateway with VHF/UHF/800 (some-P25) and HF or INMARSAT
- A Portable Fly Away Package with VHF/UHF FM (non-P25) on Texas Statewide Interoperability Channel Plan, Aviation Radio, MSAT
- VHF Handheld (non-P25 XTS-5000) on 150MHz Texas Statewide
- Interoperability Channel Plan channels
- A VHF Portable Repeater (non-P25)
- UH60 and CH47 helicopters with commercial VHF/UHF radio (non-P25)
- 900 - Blackberry's (Phone, Email and SMS Text Messaging)
- 1000 - Cell phones
- 10 Deployable HF Stations w/Email via HF PMBO gateways (TXSG on MARS & RACES/Ham nets)
- Sustaining Base Command and Control Data Network with Primary and Alternate Data Centers, dedicated ATM T1 data links to 101 sites and all required systems to support disaster response, MS Exchange Email, CITRIX Remote Access Portal, VPN, WEBEOC, SharePoint Website, and so on. Supports all deployed satellite packages.

Non-Interoperable communication equipment used by TXMF includes:

- 2000 UHF Handheld (non-P25 XTS-5000) on 380-420 MHz
- Two UHF Repeaters P25 (380-420 MHz) • >20 Portable military 20watt HF stations (PRC-150) capable of voice and data modes.
- A Large Military Satellite Package (CBCS) (many phones and much data, large scale) Requires DOD satellite airtime approval.
- >1000 - Military SINCGARS Radio (30-88MHz) FM/Digital/Secure.
- >20 - Military Single Channel Satellite Radios (SCAMP, PSC-5, PRC-117F) Requires DOD satellite airtime approval.
- TKO (Texas Knowledge On-Line) - Common Operational Picture data SharePoint Website (internal TXMF File Sharing).

## Section 13: Data Management Best Practices

**Note:** In addition to this section, it is highly recommended that you familiarize yourself with the following sections and appendices regarding privacy, civil rights, and civil liberties:

- [Section 17: Safeguarding Privacy, Civil Rights, and Civil Liberties](#)
- [Appendix M: UAS Presidential Memorandum](#)
- [Appendix N: Texas Government Code 423: Use of Unmanned Aircraft](#)

Digital images collected during training and operations are a critical resource for evaluating the effectiveness and efficiencies of PSURT procedures. Protocols must be in place to ensure data is properly managed and maintained regarding security and storage of electronic images, and to ensure the accuracy of information and compliance with applicable law as information is developed, collected, exchanged, stored, and released.

All PSURT members shall operate in compliance with applicable law protecting privacy, civil rights, and civil liberties, including, but not limited to the U.S. and Texas Constitutions, and state law, including, but not limited to the Texas Government Code Chapter 552 Public Information Act.

Failure to abide by the restrictions and use limitations may result in the suspension or termination of individual user privileges, disciplinary sanctions, or criminal prosecution.

### 13.1 Data Collection

At the conclusion of each mission, all data (stills, video, and documentation) collected during the mission shall be submitted to the Jurisdiction running the mission. That Jurisdiction shall manage, retain, and disseminate the data in compliance with their data management policy.

At a minimum, flight records shall include:

- Date and time
- Operational area
- Name of the RPIC
- Name of the VO, if applicable
- Aircraft identification
- Flight time
- Any incidents/accidents/mishaps
- Purpose of the flight

All information shall be obtained lawfully and can only be used for a business-related purpose. When applicable, information that has law enforcement or criminal intelligence value shall be collected in strict compliance with the Fourth Amendment of the United States Constitution and all other applicable federal, state, or local laws.

The Jurisdiction will not use nor allow its UAS to be deployed based upon religious, political, or social views or activities; participation in a particular organization or event; or race, color, national origin, age, disability, sex, sexual identity, sexual orientation, or any other status protected under local, state, or federal law.

All data/images (critical data, non-critical data, or training events) obtained during UAS operations are the property of the Jurisdiction in charge of the mission, except when the data is obtained at the request and on behalf of another agency.

## 13.2 Data Retention

The Jurisdiction running the mission retains any aircraft/flight records or data, including but not limited to images and/or videos and flight telemetry that are collected by the UAS equipment. Information should be stored in a manner such that it cannot be added to, modified, accessed, destroyed, or purged except by personnel authorized to take such actions.

The Jurisdiction shall assess the information to determine or review its nature, usability, and quality (when applicable, Law Enforcement will have access to this information to determine its evidentiary value). If the decision is made to retain the information, all required information (meta-data tags) shall be entered to ensure proper identification and that the chain of custody of images is maintained. These images will not be stored in any other unauthorized locations.

The information will be labeled to the maximum extent feasible, pursuant to applicable limitations on access and sensitivity of disclosure to:

- Not interfere with or compromise pending criminal investigations; and
- Protect an individual's right to privacy, or their civil rights and liberties.

All labels assigned to existing information will be re-evaluated at such times when new information is added that has an impact on access limitations or the sensitivity of disclosure of the information, or there is a change in the use of the information affecting access or disclosure limitations such as a change in case status.

All information related to an investigation conducted must be maintained pursuant to existing policies and procedures of the Jurisdiction.

If the digital imagery is related to an investigation, the PSURT member shall ensure chain of custody by following procedures related to the requesting Jurisdictional agency.

Members will not store, transfer, or utilize electronic images and digital imagery for personal use.

### 13.2.1 Data Retention Timeframe

All digital imagery shall be retained for a period that is consistent with the Jurisdictions record management ordinance/policy, and any applicable Records Retention Schedule including the State of Texas State Library and Archives Commission Retention Schedule for Records of Public Safety Agencies.

Prior to disposal of any digital imagery, the PSURT member shall communicate with their PIO, Investigations, and Department, City, Municipal, or County Legal division to ensure that the digital imagery is not the subject of a pending Public Information Act request, and/or has no evidentiary value in any pending or potential administrative, civil, criminal, or other legal proceedings.

Upon expiration of the applicable retention period, digital imagery stored shall be disposed of unless retained as part of an investigation.

The table below lists a recommended data retention schedule. When records are related to a pending criminal investigation, the records retention period shall be that which applies to criminal investigation records.

Mission Type	Retention Period
Trainings/Non-Response	90 days
Incident Response	2 years
Incident Response or Training (personnel Injured)	5 years
Structure Fires/Hazmat Incidents/Disasters	5 years
Criminal Investigations	10 years

**Note:** For more information, see the Texas State Library and Archives Commission Local Government Retention Schedules: <https://www.tsl.texas.gov/slr/recordspubs/localretention.html#PS>.

## 13.3 Dissemination

Information sharing is the responsibility of the Jurisdiction gathering the data/images. Each individual user remains solely responsible for the interpretation, further dissemination, and use of the information, and is responsible for ensuring that any information relied upon is accurate, current, valid, and complete, especially before any official action is taken in full or partial reliance upon the information obtained.

Access to information will be allowed only over secure networks or via external media devices as appropriate (for example, flash drives). Jurisdiction members shall not post, transmit, or otherwise disseminate any records or data, including images or videos, obtained via the UAS without the express consent of the department.

Data that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the Jurisdiction unless dissemination is required by law or fulfills an authorized purpose and complies with Jurisdiction requirements.

- Information should not be shared with other individuals or agencies unless there is a need and right to know the information in the performance of a public safety, law enforcement, homeland security, or public health activity. Documentation of the transference of information will be accounted for by the originating Jurisdiction.
- Information released to another agency is governed by the laws and rules governing the individual agencies in respect to such data, as well as by applicable law. Requests from a law enforcement agency, including information that is not related to an imminent threat to public safety, should not be released except upon the receipt of a subpoena or court order.

Unauthorized access, posting, transmission, or other release or dissemination of information is strictly prohibited. Information cannot be sold, published, exchanged, or disclosed for commercial purposes, or used in any way that is otherwise inconsistent with department statutes, rules, policies, or procedures. Any use of information in an unauthorized or illegal manner will subject the individual to denial of further use or access, disciplinary action, and/or criminal prosecution.

The Department Head reserves the right to restrict personnel from access to information and to suspend or withhold the access rights of any individual violating department policy.

All records, legal, and mission requests for copies of stored data/images shall be in writing and shall follow the request protocol outlined in the data management policy of the Jurisdiction that owns the data. After the request is approved, the requested copies of data imagery shall become the property of the requesting organization.

### 13.3.1 Public Information Requests

Public information requests shall be submitted to the PSURT Department Head or their designee. Requests for all other information should be handled in accordance with the procedures and legal requirements established under the Texas Public Information Act, Chapter 552 of the Government Code.

## Section 14: Public Aircraft Operations (PAO)

Title 49 of the United States Code (49 U.S.C) allows for unmanned aircraft operations to be conducted under the statutory definition of “public aircraft”. Public Aircraft Operations (PAO) are limited to certain government operations within U.S. airspace.

Whether an operation qualifies as a PAO is determined on a flight-by-flight basis, under the terms of the statute. The considerations when determining PAO are the ownership or exclusive lease of the aircraft, the operator of the aircraft, the purpose of the flight, and the persons on board the aircraft.

### 14.1 Leasing of Aircraft

sUAS leased by the department must be leased for a period of no less than 90 days in order to be utilized during a PAO mission.

### 14.2 Government Function

All missions under a department COA must meet the statutory criteria of a governmental function. Governmental function means an activity that is normally undertaken by a governmental agency such as national defense, law enforcement, search and rescue, intelligence missions and firefighting. training, and public affairs events and demonstrations do not qualify as PAO activities.

## Section 15: UAS and Law Enforcement

The deployment and use of PSURT UAS for a law enforcement or criminal intelligence gathering purpose other than an arson investigation (a suspicious activity that has a potential terrorist or criminal nexus or is relevant to the investigation and prosecution of suspected criminal activity, the justice system response, and the prevention of crime or is useful in crime analysis or in the administration of justice and public safety) must be approved by the PSURT members department prior to operations.

### 15.1 FAA Public Safety and Law Enforcement Toolkit

The FAA Public Safety and Law Enforcement toolkit provides information about operating a program and handling situations involving UAS.

The toolkit is available from the FAA website: [https://www.faa.gov/uas/public\\_safety\\_gov/public\\_safety\\_toolkit/](https://www.faa.gov/uas/public_safety_gov/public_safety_toolkit/).

Some documents that the toolkit provides include:

- A Law Enforcement pocket card with LEAP contact information and a brief guide for handling UAS incidents.
- A guide to starting a UAS program
- State and local UAS regulations
- A link to download the No Drone Zone Playbook which is a drone response playbook for Public Safety.

In addition to the above, there are links to webinars and other information.

### 15.2 Law Enforcement Assistance Program (LEAP)

FAA LEAP special agents are law enforcement points of contact. They can provide information about UAS enforcement and registration.

To learn more about the LEAP program, see [https://www.faa.gov/uas/public\\_safety\\_gov/contacts/](https://www.faa.gov/uas/public_safety_gov/contacts/).

#### **Texas LEAP Special Agent**

Kenny Maldonado ([Kenny.maldonado@faa.gov](mailto:Kenny.maldonado@faa.gov))

If your local agent is not available, you may contact any LEAP agent or contact the LEAP program at [UAShelp@faa.gov](mailto:UAShelp@faa.gov) or 844-FLY-MY-UA.



## Section 16: Use of Force Best Practices

It may become necessary for a sUAS Remote Pilot to use an unmanned aircraft to aid in the ending of the commission of a crime to mitigate a threat.

In accordance with the FAA REAUTHORIZATION ACT OF 2018 Sec. 363. PROHIBITION REGARDING WEAPONS; you may not operate an unmanned aircraft or unmanned aircraft system that is equipped or armed with a dangerous weapon as defined in section 930(g)(2) of title 18, United States Code, this includes lethal and less than lethal munitions.

It may be necessary, in extreme circumstances, including but not limited to active shooter situations, to fly a sUAS into a person if the remote pilot reasonably believes that deadly force is immediately necessary to defend themselves or another person from a substantial risk of death or serious bodily injury. All use of force involving sUAS should be guided by your agency's Use of Force policy.

The use of an unmanned aircraft to create a distraction or obstruction that is not intended to come into contact with a person is not considered a use of force. Should the use of an unmanned aircraft as a use of force tool create a substantially likelihood of serious bodily injury or death, you should be guided by your agency's Use of Force policy.

Deadly use of force is not justified by means of an autonomous sUAS when the sUAS is being operated in autonomous mode. Autonomous sUAS means a sUAS that operates autonomously through computer software or other programming.

The use of an unmanned aircraft to mitigate a threat to human life should be restricted to circumstances authorized by law and only to the degree necessary to accomplish a law enforcement objective. Any use of force should be reassessed throughout the incident when circumstances change so that the use of force remains objectively reasonable.

Any use of force involving an unmanned aircraft should be subject to the same post-action review as any other use of force. All uses of force involving unmanned aircraft should be documented and reviewed per your department policy. Remote Pilots who have used force against any individual shall, as soon as reasonable, report the incident to their immediate supervisors.

## Section 17: Safeguarding Privacy, Civil Rights, and Civil Liberties

As UAS integrate into the National Airspace System (NAS), the Federal Government is taking steps to ensure that the integration considers not only our economic competitiveness and public safety, but also the privacy, civil rights, and civil liberties concerns these systems may raise.

It is highly recommended that you familiarize yourself with the following sections and appendices regarding data management, privacy, civil rights, and civil liberties:

- [Section 13: Data Management Best Practices](#)
- [Appendix M: UAS Presidential Memorandum](#)
- [Appendix N: Texas Government Code 423: Use of Unmanned Aircraft](#)

### 17.1 Federal Grants

The Presidential Memorandum requires implementation of certain privacy protections. To receive certain Federal or Homeland Security Grants such as the Emergency Management Performance Grant (EMPG), your UAS program must comply with the requirements stated in the memorandum.

# Section 18: Reporting Requirements

**Note:** For more information about Texas unmanned aircraft regulations, see [Appendix N: Texas Government Code 423: Use of Unmanned Aircraft](#).

## 18.1 FAA Reporting Requirements

### 18.1.1 Reporting Requirements: 14 CFR § Part 107

No later than 10 calendar days after an operation that meets the criteria of either paragraph (a) or (b) of this section, a RPIC must report to the FAA, in a manner acceptable to the Administrator, any operation of the small unmanned aircraft involving at least:

- (a) Serious injury to any person or any loss of consciousness; or
- (b) Damage to any property, other than the small unmanned aircraft, unless one of the following conditions is satisfied:
  - The cost of repair (including materials and labor) does not exceed \$500; or
  - The fair market value of the property does not exceed \$500 in the event of total loss.

### 18.1.2 Reporting Requirements: COA

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. NOTE: Negative (zero flights) reports are required.
2. The operator must submit the following information monthly to [9-AJV-115-UASOrganization@faa.gov](mailto:9-AJV-115-UASOrganization@faa.gov):
  - a. Name of Operator, exemption number, and aircraft registration number
  - b. UAS type and model
  - c. All operating locations, to include location city/name and latitude/longitude
  - d. Number of flights (per location, per aircraft)
  - e. Total aircraft operational hours
  - f. Takeoff or landing damage
  - g. Equipment malfunctions. Reportable malfunctions include, but are not limited to, the following:
    - i. On-board flight control system
    - ii. Navigation system
    - iii. Power plant failure in flight
    - iv. Fuel system failure
    - v. Electrical system failure
    - vi. Control station failure
3. The number and duration of lost link events (control, performance and health monitoring, or communications) per UAS per flight.
4. Incident/Accident/Mishap Reporting After an incident or accident that meets the criteria below, and within 24 hours of that incident, accident or event described below, the proponent must provide initial notification of the following to the FAA via email at [9-AJV-115-UASOrganization@faa.gov](mailto:9-AJV-115-UASOrganization@faa.gov) and via the UAS COA On-Line forms (Incident/Accident).

- a. All accidents/mishaps involving UAS operations where any of the following occurs:
  - i. Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap.
  - ii. Serious injury, where the operation of a UAS results in: (1) hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.
  - iii. Total unmanned aircraft loss.
  - iv. Substantial damage to the unmanned aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight.
  - v. Damage to property, other than the unmanned aircraft.
- b. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to:
  - i. A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)
  - ii. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)
  - iii. A power plant failure or malfunction
  - iv. An in-flight fire
  - v. An aircraft collision involving another aircraft.
  - vi. Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight
  - vii. A deviation from any provision contained in the COA
  - viii. A deviation from a LAANC clearance and/or Letter(s) of Agreement/Procedures
  - ix. A lost control link event resulting in
    1. Fly-away, or
    2. Execution of a pre-planned/unplanned lost link procedure.
- c. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.
- d. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations.
- e. Civil operators and Public-use agencies (other than those which are part of the Department of Defense) are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.
- f. For other than Department of Defense operations, this COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

### 18.1.3 FAA Report Submission

Any incident or accident that occurs while operating under a COA shall be reported to the FAA via the CAPS On-Line Accident/Incident Report and initially reported via email at: [9-AJV-115-UASOrganization@faa.gov](mailto:9-AJV-115-UASOrganization@faa.gov).

All other incident/accident reports may be submitted to the FAA Regional Operations Center by phone at 817.222.5006 or electronically at [http://www.faa.gov/about/office\\_org/field\\_offices/fsdo/](http://www.faa.gov/about/office_org/field_offices/fsdo/).

The report must include the following information:

- UAS RPIC's name and contact information
- UAS RPIC's FAA airman certificate number
- UAS registration number issued to the aircraft, if required
- Location of the accident/incident
- Date of the accident/incident
- Persons injured and extent of injury, if any or known
- Property damaged and extent of damage, if any or known
- Description of accident/incident

## 18.2 NTSB Reporting Requirements (49 CFR §830)

Federal regulations require operators to notify the NTSB immediately of aviation accidents and certain incidents. An accident is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. An incident is an occurrence other than an accident that affects or could affect the safety of operations.

### 18.2.1 NTSB Report Submission

All incident/accident reports may be reported to the NTSB's Response Operations Center (ROC) at 844.373.9922. A phone call is sufficient initially, but a written follow-up may be required.

When contacting the ROC, be ready to provide the following information (49 CFR 830.6):

- Type, nationality, and registration marks of the aircraft
- Name of owner, and operator of the aircraft
- Name of the RPIC
- Date and time of the accident
- Last point of departure and point of intended landing of the aircraft
- Position of the aircraft with reference to some easily defined geographical point
- Number of persons aboard, number killed, and number seriously injured
- Nature of the accident, the weather and the extent of damage to the aircraft, so far as is known
- A description of any explosives, radioactive materials, or other dangerous articles carried

Contacting the NTSB ROC and providing the above listed items satisfies the reporting requires dictated by **49 CFR 830.5 – Immediate Notification**.

## Section 19: Training and Certification Process

### 19.1 Overview

The purpose of the PSURT RPIC certification is to create a standard for Public Safety RPIC's. This is imperative in cases where RPIC's are requested for a multi-Jurisdictional mission.

For example, if you have a large-scale night mission and you need aid from neighboring Jurisdictions, you can request PSURT Level 2 RPIC's and you know that they will have the experience you need to fly the mission.

The PSURT program includes the following courses:

- **PSURT UAS RPIC Level 1** – Day missions, indoor and outdoor flights
- **PSURT UAS RPIC Level 2** – Day missions, night missions, indoor and outdoor flights
- **PSURT UAS Visual Observer**

After a RPIC is certified at a specific level and on a specific aircraft, they are added to the PSURT database. A PSURT agency may access the database to confirm a RPIC's level and aircraft type.

### 19.2 Aircraft Type

Each certification has a level and a specific aircraft type. For example, you may be a PSURT Level 2 RPIC on the Mavic 2 Enterprise. You must certify separately for each aircraft you wish to fly.

If you have completed ground school within the past year, on the level for which you are certifying with the new aircraft, you only need to complete the hands-on and scenario-based portions of the Level 1 or Level 2 course to qualify on the new aircraft. If it has been more than a year since you completed ground school, you will need to complete the recertification course which includes flight time. If you are certifying at a higher level, you will need to complete the entire course on the level for which you are certifying.

### 19.3 UAS Proficiency Course



The UAS proficiency course ensures that all department RPIC's have the skills necessary to safely operate a UAS in the field.

The proficiency course is based on the *National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing UAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods*.

The course is a required component of the PSURT UAS RPIC Level 1 and Level 2 courses.

It is highly recommended that anyone who proctors this course has completed the NIST sUAS Standard Test Methods Proctor Training Course.

**Note:** For information about setting up the course, see [Appendix H: The NIST UAS Proficiency Course](#).

### 19.4 Certification Levels

#### 19.4.1 PSURT UAS RPIC Level 1

RPIC's who qualify for PSURT UAS RPIC Level 1 have successfully completed all of the requirements listed below and have been certified by a qualified PSURT instructor on a specific aircraft for day missions only.

1. RPIC has a current FAA Part 107 Remote Pilot certificate
2. RPIC has completed the following PSURT UAS RPIC Level 1 Course ground school topics:

- Standard Operating Procedures
  - Mission Planning
  - Texas Government Codes
  - Case Law
3. RPIC has completed the following PSURT UAS RPIC Level 1 Course hands-on training:
    - Setup
    - Basic flight maneuvers
    - Using the camera (not thermal or FLIR)
    - Setting flight modes
  4. RPIC has completed the following PSURT UAS RPIC Level 1 Course scenario-based flights:
    - Scenario 1: Search and Identify
    - Scenario 2: Barricaded Suspect
    - Scenario 3: Mapping / Photogrammetry
    - Scenario 4: Overwatch / Indoor
    - Scenario 5: Search and Rescue
  5. RPIC has completed the following PSURT UAS RPIC Level 1 Course proficiency tests based on the National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing sUAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods:
    - Hold position and altitude
    - Orbit a point
    - Fly straight and level
    - Identify and inspect objects
    - Land accurately

### 19.4.2 PSURT UAS RPIC Level 2

RPIC's who qualify for PSURT UAS RPIC Level 2 have successfully completed all the requirements listed below and have been certified by a qualified PSURT instructor on a specific aircraft for both day and night missions.

1. RPIC has a current FAA Part 107 Remote Pilot certificate
2. RPIC has completed all PSURT UAS RPIC Level 1 Course requirements
3. RPIC has completed the following PSURT UAS RPIC Level 2 Course ground school topics:
  - UAS Night Operations
  - How the Eye Works
  - Spatial Disorientation and Visual Illusions
  - Improving Your Night Vision
  - Thermographics
4. RPIC has completed the following PSURT UAS RPIC Level 2 Course hands-on training:
  - Setup
  - Basic flight maneuvers
  - Using the camera (thermal / FLIR)
  - Setting flight modes
5. RPIC has completed the following PSURT UAS RPIC Level 2 Course scenario-based flights:

- Scenario 1: Search and Identify
  - Scenario 2: Search and Rescue
  - Scenario 3: Track Suspect
6. RPIC has completed the following PSURT UAS RPIC Level 2 Course proficiency tests based on the National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing sUAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods:
- Hold position and altitude
  - Orbit a point
  - Fly straight and level
  - Identify and inspect objects
  - Land accurately

### 19.4.3 PSURT UAS Visual Observer

A crew member qualifies as a Visual Observer for both day and night missions when they have successfully completed all the PSURT UAS Visual Observer Course topics listed below and have been certified by a qualified PSURT instructor.

- UAS Operations
- Definitions and Roles
- Understanding Airspace, NOTAMs, and TFR's
- Night Operations
- How the Eye Works
- Spatial Disorientation and Visual Illusions
- Improving Your Night Vision
- The Who, What, and When of Being a VO

## 19.5 Recertifying

### 19.5.1 RPIC Recertification

Each RPIC certification is valid for one year from date of test, at which time the RPIC must recertify on each aircraft they fly. The recertification is a one-day class that includes ground school and a hands-on flight test.

- Ground school covers rules and regulations that have changed in the past year, as well as new and revised best practices learnt in the field. In addition, the RPIC is required to pass a written test like the recurrent Part 107 test that includes questions about airspace, maps, weather, mission planning, FAA rules and regulations, among other topics. Both Level 1 and Level 2 RPIC's complete the test; however, there is an additional section in the test for Level 2 RPIC's to complete that covers night operations.
- The hands-on flight test is scenario-based using one or more of the scenarios in the Level 1 or Level 2 training courses.

A suggested course schedule is shown below; the number of flight slots depends on the number of instructors and students.

With this schedule, you can have both Level 1 and Level 2 RPIC's attend training on the same day. Level 1 RPIC's complete their flight test first and then attend ground school. Level 2 RPIC's attend ground school first and then complete their flight test.



TIME	DESCRIPTION
09h00 – 18h00	Schedule one-hour slots for Level 1 (daytime) flight tests. The RPIC should schedule a separate timeslot for each aircraft on which they want to recertify.
18h00 – 20h00	Ground School for Level 1 and Level 2 RPIC's. <ol style="list-style-type: none"> <li>1. Test</li> <li>2. Information applicable to Level 1 and Level 2 RPIC's.</li> <li>3. Level 1 RPIC's may leave.</li> <li>4. Information applicable to Level 2 RPIC's.</li> </ol>
20h00 – 23h00	Schedule one-hour slots for Level 2 (nighttime) flight tests.

### 19.5.2 Visual Observer Recertification

While a Visual Observer is not required to recertify, it is recommended that they attend the PSURT UAS Visual Observer class again if it has been a substantial amount of time since they worked in a Visual Observer role.

## 19.6 PSURT UAS RPIC Certification Form

At the completion of the course, the instructor shall complete the relevant PSURT RPIC Missions Qualification Checklist and the PSURT UAS RPIC Certification Form and send a copy of both to the RPIC's department/agency. The RPIC qualifies as a PSURT RPIC as soon as the department/agency endorsing officer signs the form.

**Note:** For examples, see [Appendix J: Training Form Examples](#). The forms are included with the PSURT program.

## 19.7 Existing Training Program

If you already have an existing training program that meets or exceeds the PSURT program requirements, contact the PSURT Administration to request an audit of your program to have it accepted as an alternate PSURT training program for your agency or Jurisdiction.

## Section 20: Administering the PSURT Program at the COG Level

Use the topics in this section as a guide for administering the PSURT program at the COG level; managing and supporting the Jurisdictions within the COG that are using the program.

### 20.1 PSURT Database

Use a PSURT database to centralize information about the COG Jurisdiction PSURT programs, UAS crew members, hardware, and software. This is useful for COG and FAA reporting, as well as for mutual aid deployments when you want to know who to call for flight crews and specialized equipment.

Your database can be a commercial or in-house program, a Microsoft Access database, or a Microsoft spreadsheet.

The database might include information such as:

- PSURT Program Manager (Program POC) contact information
- COG-level waiver and/or COA information and expiration dates
- PSURT RPIC's
  - Certification level (Level 1 or Level 2)
  - Certification expiration date
  - FAA Part 107 Remote Pilot certificate number and expiration date
- Other Flight Crew Member Details
- Aircraft
  - Aircraft type, registration number, location
  - Camera specifications (Zoom, Thermal, FLIR)
  - Aircraft maintenance schedules
  - Batteries
  - Controllers
- Software
  - Number of users
  - Vender contact information
  - License expiration dates

### 20.2 Subject Matter Experts / Support Line

It might be helpful to designate a general email account and/or support line that Jurisdictions can contact for questions or advice about their PSURT program.

They may need advice about the type of aircraft to purchase, or where to go for Part 107 training and certification. They may need assistance with understanding a specific FAA rule or writing a waiver request.

## 20.3 Waiver and COA Maintenance and Reporting

- All COG-level waivers need to be renewed periodically
- All COG-level COA's require monthly reporting

## 20.4 Program and Training Documentation

The industry is changing so rapidly, and the FAA laws continue to be updated and changed on a regular basis. To ensure that your RPIC's and program continue to meet FAA and state/federal requirements, it is important to keep the program and training documentation up to date.

This includes adding and editing information based on new technology and updated/new/changed laws, as well as changes to best practices based on lessons learned in the field. As the policies change, the training curriculum should also be updated to reflect these changes.

You should implement a process to get the updated information out to each Jurisdiction and to answer any questions from instructors.

## 20.5 Equipment Scheduling and Maintenance

If the COG owns equipment that is available for training, set up an online (preferably) booking system that Jurisdictions can use to borrow the equipment. When equipment is checked out, a form is completed that notes details of all equipment and if there is any damage to it. When the equipment is returned, if anything is damaged or missing, the Jurisdiction that borrowed the equipment should pay the repair/replacement costs.

## 20.6 PSURT Program Administrator

The PSURT Program Administrator oversees the PSURT programs at the COG level. This position has the following responsibilities:

<b>Maintain PSURT Database</b>	Ensure that each Jurisdiction running the program sends in regular reports and they update the database accordingly. For example, adding/removing RPIC's and aircraft, adding/removing programs, sending reminders to Jurisdictions when their RPIC's are nearing recertification deadlines.
<b>Subject Matter Expert</b>	Point person when any of the Jurisdictions have questions or need assistance with anything relating to the PSURT program.
<b>Waiver and COA Maintenance and Reporting</b>	If there are COG-level waiver's and/or COAs, complete any required reporting, and complete the necessary paperwork for any new waiver's or COAs.
<b>Maintain Program and Training Documentation</b>	Maintain the PSURT Program and Training Guides and update them as needed when laws or best practices change. They make sure that all Jurisdictions receive copies of any updated materials. They work with the Jurisdictions to ensure that instructors are up to date with the latest information.
<b>Equipment Scheduling and Maintenance</b>	If the COG owns training equipment, purchase and maintain the equipment (aircraft, batteries, cables, controllers, and so on). They manage the schedule for Jurisdictions to use the equipment. They manage COG equipment repairs and purchases.
<b>Software Maintenance</b>	If the COG provides software for all Jurisdictions to use, manage the licenses.

# Appendix A: Flight Checklist Example

Use the information in this section to create a checklist that is relevant to your department / agency.

## Preflight

### Step 1: At the Office

- Aircraft documentation
- NOTAM
- Local Regulations and permissions
- Proximity to the airport
- Weather conditions
- Batteries charged
- Flight gear check

### Step 2: At the Mission Location

- Scan ground, sky, take-off, and landing area for obstacles that may interfere with the UAS
- Wind check
- Confirm mission flight plan
- Flight crew briefing (example, flight mission and safety)
- File daily flight report
- Assemble UAS
  - Visual condition inspection of the UAS components such as:
    - Airframe structure and attachment points
    - Moveable control and flight surfaces
    - Propulsion system including powerplants, propellers, motors, ducted fans, and so on.
    - Servo motors including attachment points
  - Registration displayed and legible
  - Batteries securely mounted
  - Equipment (for example, a camera) securely attached
  - Fuel (correct type and quantity)

### Turn on Control Unit and Aircraft (in that order)

- Verify all systems (for example, aircraft and control unit) have an adequate energy supply for the intended operation and are functioning properly
- Control unit:
  - Antennas set to correct orientation
  - Display panel, if used, is functioning properly
  - Control link correct functionality is established between the aircraft and the CS
  - Sensor / Camera setting check

- Calibrate UAS compass prior to any flight
- Verify communications with UAS and that the UAS has acquired GPS location from at least 4 satellites
- Set/Confirm RTH
- Check flight termination system, if installed
- Confirm SD card is inserted and formatted
- Aircraft:
  - Inspect propellers for any imbalance or irregular operation
  - Final airframe inspection
- Check ground support equipment, including takeoff and landing systems, for proper operation
- Wind check for launch

## During Flight

### Step 3: After Launch

- Aircraft reached safe altitude
- Confirm correct movement of control surfaces using the CS
- Confirm observer has the aircraft in sight
- All systems green
- Satellite and GPS check
- At a controlled altitude, fly within range of any interference and recheck all controls and stability
- Check remaining battery (regularly throughout flight)

### Step 4: Before Landing

- Ensure UAS flight completed according to mission plan
- Scan landing area for obstacles
- Wind check
- Observer briefing for landing
- All systems green

## Post Flight

### Step 5: After Landing

- Power down UAS
- Remove and safely store batteries
- Airframe inspection
- Check SD card data to confirm data collected
- Transfer data and flight log
- If needed, log SD card into evidence
- Complete logbook entry

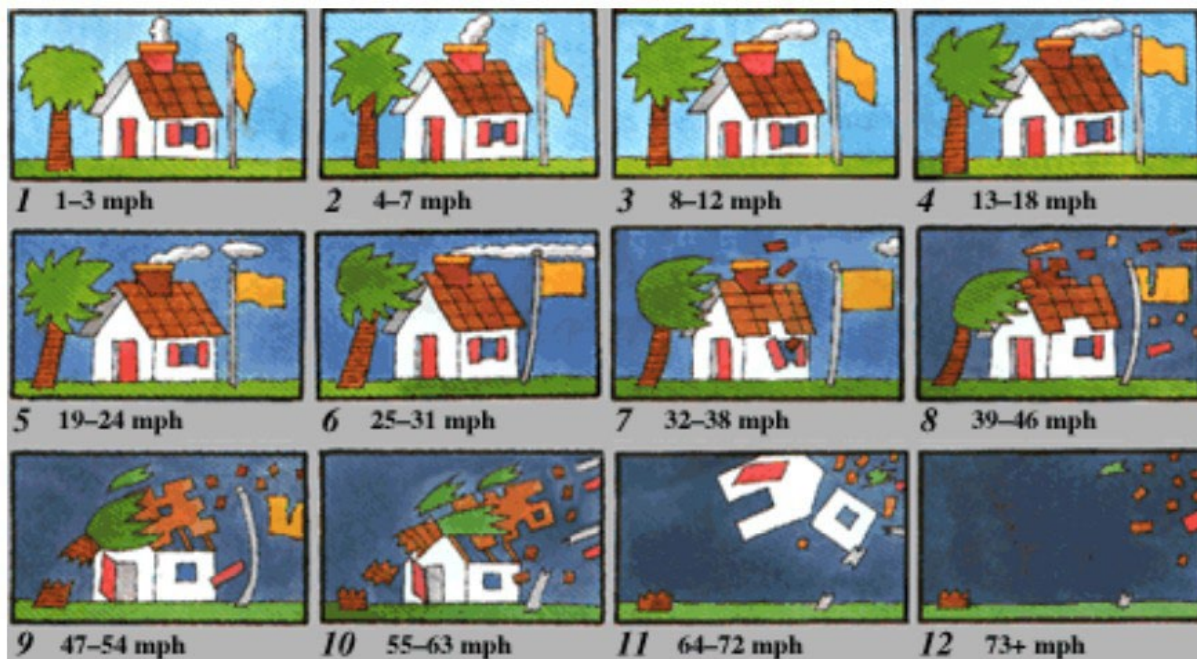
### **Step 6: Back at the Office**

- Flight and maintenance report
- Charge batteries
- SD card cleaned and ready to use (unless handed in as evidence)
- Airframe check
- Process data



## Appendix C: Beaufort Wind Scale

The Beaufort wind force scale is a measure that relates wind speed to observed conditions at sea or on land.





# Appendix D: Flight Hand Signals

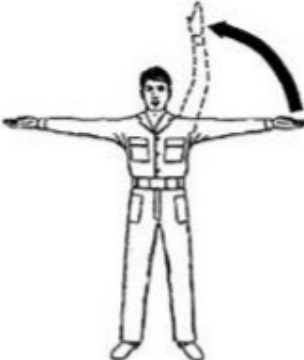
Move Forward



Move Rearward



Move Left



Move Right



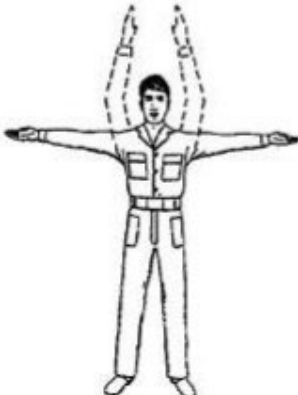
Stop



All Clear



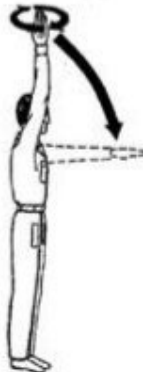
Move Upward



Move Downward



Clear to Take-off



(EdgeData, 2016)

## Appendix E: Contingency Plan Checklist

Event	Result	Procedure
<b>Battery depletes</b>	Unmanned aerial system (UAS) incapable of continuing flight operations.	UAS return to base (RTB) as soon as practical; cease data collection.
<b>Ditch Procedures</b>	UAS incapable of continuing flight operations.	Identify safe landing area; attempt a controlled landing; if able, land UAS in water (shallow preferred for ease of recovery) away from public.
<b>Fuel Depletes</b>	UAS incapable of continuing flight operations.	UAS RTB as soon as practical; cease data collection.
<b>Hazardous Weather</b>	UAS incapable of continuing flight operations.	UAS RTB as soon as practical; cease data collection.
<b>Hostile Environment</b>	Mission impacted by hazard (for example, air traffic, public activity).	See and avoid; take evasive action as required with safety taking precedence; UAS RTB as soon as practical.
<b>Loss of Communications</b>	Mission impacted by lack of communications hazard.	Maintain visual line of sight (VLOS); take evasive action as required with safety taking precedence; UAS RTB as soon as practical.
<b>Loss of Control Signal</b>	UAS not controllable.	Maintain VLOS; UAS RTB and land without harm to UAS or contacting surrounding objects.
<b>Loss of Direct Visual</b>	UAS could become a hazard if unable to regain visual control.	Regain direct visual of UAS; contact mission payload operator and/or visual observer to determine status.
<b>Loss of GPS Signal</b>	Use extreme caution as the positional data for the UAS will not be accurate.	Assume manual control of the UAS; Maneuver and climb UAS to reacquire GPS signal; if GPS signal cannot be reacquired, determine whether safe UAS control can be maintained. If safe flight cannot be maintained, land as soon as practical.
<b>Loss of Situational Awareness (SA)</b>	UAS could become a hazard if unable to regain SA.	Climb to a safe altitude; reorient with use of sensors; RTB if required.
<b>Privacy Impact</b>	Possible public complaint.	Cease data collection; RTB and complete an assessment.
<b>UAS Failure</b>	UAS incapable of continuing flight operations.	Maintain VLOS; UAS RTB as soon as practical.

# Appendix F: Suggested Safety Equipment Checklist

## Suggested Equipment

This equipment is in addition to department uniform, basic responder equipment, and specific UAS Kits.

- Dispatch Radios
- Air Band Radios
- Traffic Cones
- Safety Vests (Pilot ID Vests)
- First Aid Kit including Tourniquet
- Lighting Kit (Red/Blue or UV Light Bars for Aircraft)
- Hydration Pack with Water and Snacks
- Binoculars
- Portable Wind Gauge
- Spare Radio Batteries
- Spare Connection Cables
- Flashlight
- Hat
- Sunscreen
- Insect Spray

# Appendix G: Mission Planning Profile

<b>Mission Profile</b>	<b>Location (Name, Latitude, Longitude)</b>	<b>Date:</b>		<b>ETD:</b>		<b>ETA:</b>		
	<b>Daylight Hours:</b>	<b>Crew Assigned:</b>						
		<b>Waypoint</b>	<b>Transit (T) or Hover (H)</b>	<b>Altitude AGL (ft)</b>	<b>Estimated Leg Duration (mm : ss)</b>	<b>Activity</b>		
<b>Total Flight Time (TFT)</b>								
<b>Statutory Reserve (SR) (TFT x 0.20*)</b>								
<b>Mission Requirement (TFT + SR)</b>								
<b>Max Load UAS Flight Time</b>								
<b>Notes:</b>								
*With respect to TFTs and SRs, a UAS flight should be able to be completed with 20% energy reserves (fuel or battery) remaining or a 5-minute reserve or the manufacturer recommendation, whichever is greater.								
Acronyms: ETD = estimated time of departure, ETA = estimated time of arrival, AGL = above ground level								

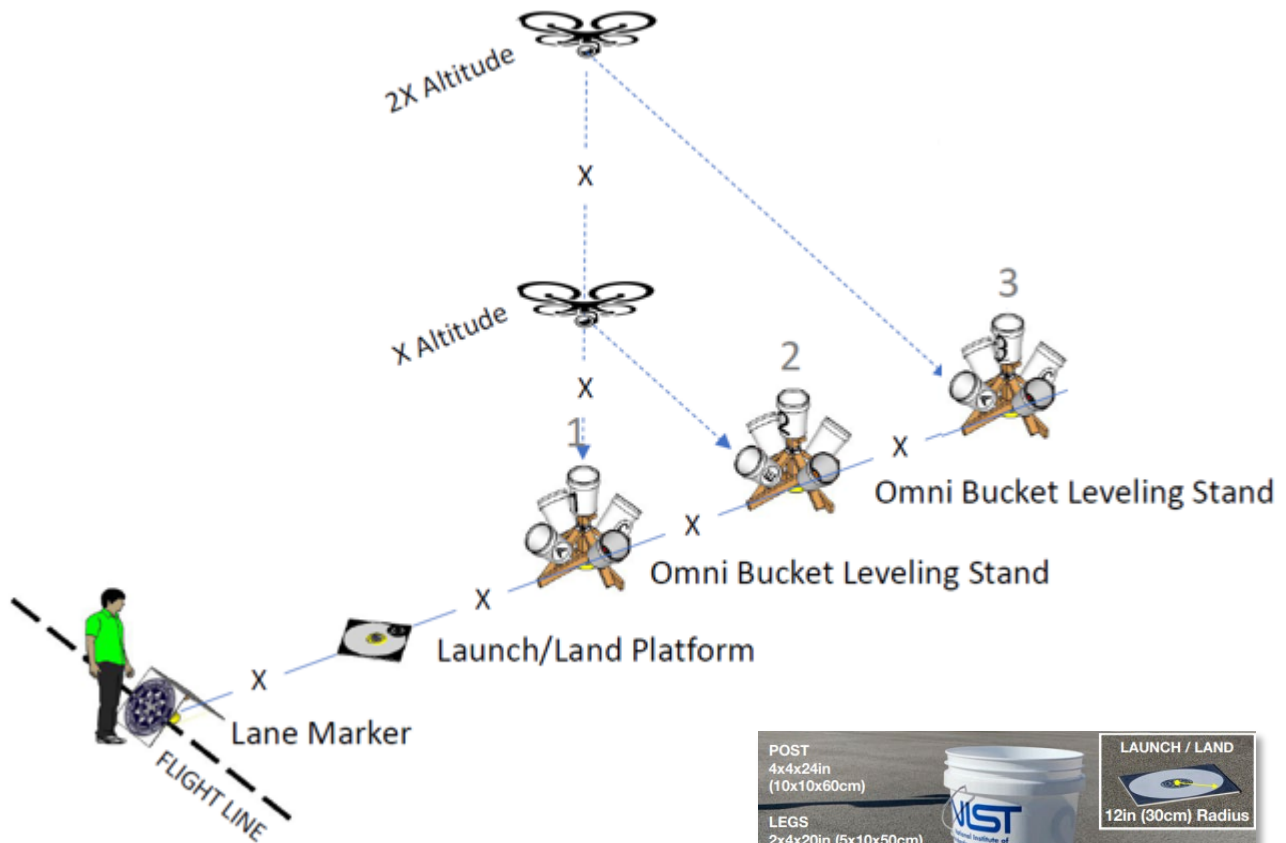
<b>Organizational Point of Contact</b>	<b>Contact Numbers</b>
National grid operations center	
Local electric utility distribution network office	
Service provider local field services office	
County road supervisor	
County sheriff dispatch office	
County fire department	
Closest medical facility	
Internet/phone providers	
Site manager	
Remote Pilot In Command (RPIC)	
Visual observer	
Mission payload operator	
Subject matter expert	

# Appendix H: The NIST UAS Proficiency Course



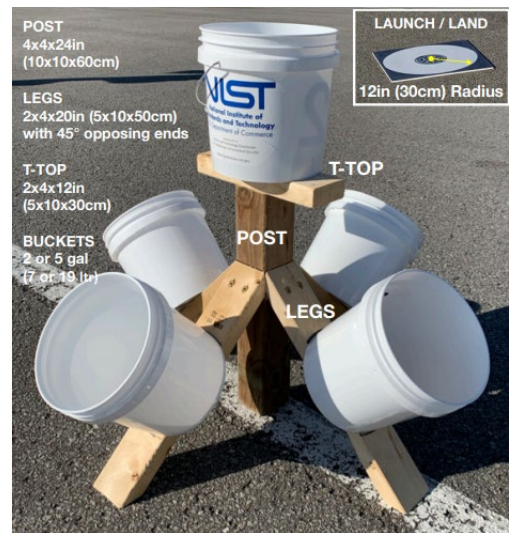
The proficiency course is based on the *National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing UAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods*.

**Note:** For information about the NIST course, and for detailed setup steps, including printable stickers, see the *NIST Standard Test Methods for sUAS\_v20190905.pdf* that is included with this program.



## Lane Features

- Pilot flight line for safety (A-frame as lane marker).
- Centerline using 100ft (30m) measuring tape.
- Launch/Land platform to measure accuracy.
- Bucket stands with vertical and angled white buckets that can be stowed and transported
- Optional outriggers that enable bucket stands to be leveled on uneven terrain
- Apparatus spacing is 10ft (3m)
- Flight altitudes are 10ft (3m) and 20ft (6m)
- Overall length is 50ft (15m)



## Supplies

Three Omni bucket levelling stands and 1 launch/land platform panel.

Quantity	Item
3	4 x 4 x 24in posts
12	2 x 4 x 20in legs, 45deg cuts both ends opposing
3	2 x 4 x 12in T-tops
12	2 x 2 x 24in or 2x4x24in outriggers (uneven terrain)
100	3-1/in washer head screws to secure lumber joints
15	Bolts with wing nuts to secure buckets, allowing buckets to be easily removed
15	2- or 5-gallon white buckets
1	Launch / Land platform panel with 12in radius circle
1	100ft measuring tape as center line
1	Post level to measure vertical
1	Thick black marker to inscribe 1in (25mm) rings inside buckets and write letters inside and out. Or 8in (200mm) round white polyester weatherproof labels can be printed from the QUICK START GUIDE downloadable from <a href="http://www.RobotTestMethods.nist.gov">www.RobotTestMethods.nist.gov</a> Aerial Systems web page.

**Note:** For night missions, in addition to the standard course setup, you will need to either strap inward-facing lights to each bucket or put a hand-warmer inside each bucket for thermal flights.

# Appendix I: Continuing Education

## Purpose Statement

PSURT is dedicated to the continuous development of team members and highly recommends that members not only continue through the more advanced phases of the PSURT program but also consider training outside the group. Associations and organizations are another great source for training and updated information relating to public safety UAS.

## Training Resources

- DronePilots Inc.** DronePilots, Inc. (<https://dronepilotinc.com>) is a local public safety specific training organization that offers basic and advanced courses for Unmanned Systems. Courses include:
- Eyes Overhead (Introduction to Public Safety Flight) — 100 Hour Course
  - 30,000 Foot Administrator (UAS Program Admin Course) — 16 Hour Course
- Pix4D** Pix4D (<https://www.pix4d.com>) offers free courses in a self-study format to help pilots become more familiar with their software. In addition, Pix4D offers a certification on their products, available by submitting a project and taking a written exam.
- Reveille Peak Ranch** Reveille Peak Ranch and Granite Defense (<https://www.granitedefense.com>) offer several courses and “Flight Nights” used to introduce new products, gain flight experience, and network with other local crews. Courses include:
- PSURT Level 1 & 2
  - CQB Flight Operations
  - NIST Course Practice and Qualifications
- AUVSI TOP Program** AUVSI (<https://www.auvsi.org>) offers the Trusted Operator Program (TOP) through several authorized providers. These courses are geared for the commercial pilot but are also applicable to public safety flight. Courses include:
- **TOP Level 1** — Internet based review of Part 107 rules and flight planning practices.
  - **TOP Level 2** — Classroom based advanced review of Part 107, advanced flight planning, and emergency procedures. Specific flight planning for your agency specific missions with hands on.
  - **TOP Level 3** — Expert level of program / pilot policy and procedures and how they relate to Part 107. Specific attention to safety, operations, documentation, air boss operations and emergency procedures.
- FAASTeam** The [www.faasafety.gov](http://www.faasafety.gov) site offers activities, courses, seminars, and webinars.
- NFPA Public Safety Drone Online Training** <https://catalog.nfpa.org> (search for *Public Safety Drone Guide*). Web-based training curriculum offering instruction for the administration, operation, and maintenance of a public safety drone program. Based on NFPA 2400, *Standard for Small Unmanned Aircraft Systems (sUAS) Used for Public Safety Operations*.


## Associations

- AUVSI** The Association for Unmanned Vehicle Systems International (AUVSI), the world's largest nonprofit organization dedicated to the advancement of unmanned systems and robotics, represents corporations and professionals from more than 60 countries involved in industry, government, and academia. AUVSI members work in the defense, civil and commercial markets. <https://www.auvsi.org>
- Airborne Public Safety Association** APSA's mission is to support, promote and advance the safe and effective utilization of aircraft by governmental agencies in support of public safety missions through training, networking, advocacy, and educational programs. <https://publicsafetyaviation.org>
- Public Safety Flight Association** The Public Safety Flight website is dedicated to news, information, tips, and stories about the use of unmanned aircraft systems (UAS), UAVs, aircraft, and drones in the fire service and other public safety niches. <https://psflight.org>



# Appendix J: Training Form Examples

## PSURT UAS RPIC Level 1 Checklist



### PSURT UAS RPIC LEVEL 1 CHECKLIST

- For detailed information about the RPIC levels, see the *PSURT UAS Program Guide*.
- For detailed information about the course and testing procedures, see the relevant *PSURT Training Documents*.

INITIAL / RECURRENT		TESTING INFORMATION			
<input type="checkbox"/> INITIAL	<input type="checkbox"/> RECURRENT	TEST DATE		TEST LOCATION	

RPIC INFORMATION			
RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

AIRCRAFT INFORMATION			
UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

GROUND SCHOOL	PASS
STANDARD OPERATING PROCEDURES	
MISSION PLANNING	
TEXAS GOVERNMENT CODES	
CASE LAW	

HANDS-ON BASIC PROFICIENCY	PASS
SETUP	
BASIC FLIGHT MANEUVERS	
USING THE CAMERA	
SETTING FLIGHT MODES	

SCENARIO-BASED FLIGHTS	PASS
SCENARIO 1: SEARCH AND IDENTIFY	
SCENARIO 2: PERS. SITUATIONAL AWARENESS	
SCENARIO 3: MAPPING / PHOTOGRAMMETRY	
SCENARIO 4: OVERWATCH / INDOOR	
SCENARIO 5: SEARCH AND RESCUE	

PROFICIENCY TESTING	PASS
POSITION MANEUVERING 1	
POSITION MANEUVERING 2	

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

---

**INSTRUCTOR SIGNATURE**

---

**RPIC SIGNATURE**

---

**DATE**

# PSURT UAS RPIC Level 2 Checklist



## PSURT UAS RPIC LEVEL 2 CHECKLIST

- For detailed information about the levels, see the *PSURT UAS Program Guide*.
- For detailed information about the course and testing procedures, see the relevant *PSURT Training Documents*.

**INITIAL / RECURRENT**  
 INITIAL  RECURRENT

**TESTING INFORMATION**

TEST DATE		TEST LOCATION	
-----------	--	---------------	--

**RPIC INFORMATION**

RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

**AIRCRAFT INFORMATION**

UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

GROUND SCHOOL	PASS
UAS NIGHT OPERATIONS	
HOW THE EYE WORKS	
SPATIAL DISORIENTATION / VISUAL ILLUSIONS	
IMPROVING YOUR NIGHT VISION	
THERMOGRAPHICS	

HANDS-ON BASIC PROFICIENCY	PASS
SETUP	
BASIC FLIGHT MANEUVERS	
USING THE CAMERA	
SETTING FLIGHT MODES	

SCENARIO-BASED FLIGHTS	PASS
SCENARIO 1: SEARCH AND IDENTIFY	
SCENARIO 2: SEARCH AND RESCUE	
SCENARIO 3: TRACK SUSPECT	

PROFICIENCY TESTING	PASS
POSITION MANEUVERING 1	
POSITION MANEUVERING 2	

**INSTRUCTOR INFORMATION**

INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

\_\_\_\_\_  
**INSTRUCTOR SIGNATURE**

\_\_\_\_\_  
**RPIC SIGNATURE**

\_\_\_\_\_  
**DATE**

# PSURT UAS RPIC Certification Form



## PSURT UAS RPIC CERTIFICATION FORM

- For detailed information about the RPIC levels, see the *PSURT UAS Program Guide*.
- For detailed information about the course and testing procedures, see the relevant *PSURT Training Documents*.

<b>QUALIFICATION LEVEL</b>	<b>INITIAL / RECURRENT</b>
<input type="checkbox"/> LEVEL 1 RPIC <input type="checkbox"/> LEVEL 2 RPIC	<input type="checkbox"/> INITIAL <input type="checkbox"/> RECURRENT

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

RPIC INFORMATION			
RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

AIRCRAFT INFORMATION			
UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

\_\_\_\_\_

**INSTRUCTOR SIGNATURE**      **RPIC SIGNATURE**      **DATE**

**DEPARTMENT/AGENCY ENDORSEMENT**

*I certify that the above RPIC has successfully met all requirements for the safe operation of the listed aircraft, and may operate as a department/agency PSURT RPIC at the indicated qualification level for one year from test date.*

\_\_\_\_\_

**ENDORING OFFICER NAME**      **ENDORING OFFICER SIGNATURE**      **DATE**

\*\*\* THIS CERTIFICATION IS VALID FOR ONE YEAR FROM TEST DATE \*\*\*

# PSURT UAS Visual Observer Checklist



## PSURT UAS VISUAL OBSERVER CHECKLIST

- For detailed information about the qualification levels, see the *PSURT UAS Program Guide*.
- For detailed information about the course and testing procedures, see the relevant *PSURT Training Documents*.

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

VO INFORMATION			
VO NAME		DEPARTMENT / AGENCY	
TITLE		EMAIL	

VO COURSE TOPICS	PASS
UAS OPERATIONS	
DEFINITIONS AND ROLES	
UNDERSTANDING AIRSPACE, NOTAM's, and TFR's	
NIGHT OPERATIONS	
HOW THE EYE WORKS	
SPATIAL DISORIENTATION AND VISUAL ILLUSIONS	
IMPROVING YOUR NIGHT VISION	
THE WHO, WHAT, AND WHEN OF BEING A VO	
FINAL QUIZ	

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

\_\_\_\_\_  
**INSTRUCTOR SIGNATURE**
\_\_\_\_\_
\_\_\_\_\_  
**VO SIGNATURE**
**DATE**

# PSURT UAS Visual Observer Certification Form



## PSURT UAS VISUAL OBSERVER CERTIFICATION FORM

- For detailed information about the qualification levels, see the *PSURT UAS Program Guide*.
- For detailed information about the course and testing procedures, see the relevant *PSURT Training Documents*.

### COURSE INFORMATION

COURSE DATE		COURSE LOCATION	
-------------	--	-----------------	--

### VISUAL OBSERVER INFORMATION

VO NAME		DEPARTMENT / AGENCY	
VO TITLE		EMAIL	

### INSTRUCTOR INFORMATION

INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

\_\_\_\_\_  
INSTRUCTOR SIGNATURE

\_\_\_\_\_  
VO SIGNATURE

\_\_\_\_\_  
DATE

### DEPARTMENT/AGENCY ENDORSEMENT

*I certify that the above individual has successfully met all requirements for a PSURT Visual Observer, and may operate as a department/agency PSURT Visual Observer.*

\_\_\_\_\_  
ENDORISING OFFICER NAME

\_\_\_\_\_  
ENDORISING OFFICER SIGNATURE

\_\_\_\_\_  
DATE

# PSURT UAS Course Evaluation Form



## PSURT UAS COURSE EVALUATION FORM

COURSE TITLE \_\_\_\_\_

COURSE DATE \_\_\_\_\_

COURSE LOCATION \_\_\_\_\_

LEAD INSTRUCTOR \_\_\_\_\_

		NOT AT ALL	SOMEWHAT	VERY MUCH
1.	The training was well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	The training sessions were relevant to my needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	The presenters were well prepared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	The presenters were receptive to participant comments and questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	The scenarios helped me to learn the material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	There was enough time to cover all materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	The training enhanced my knowledge and skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	I expect to use the knowledge from this training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please reflect on the training that you just completed and respond to the following:

1. What part of the training was the most useful to you?
  
2. What information/topics should be added to this training?
  
3. How could the course be improved?
  
4. Other comments

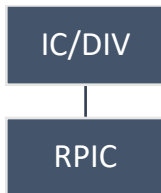
## Appendix K: UAS Modules and Packages (ICS Structure) Example

UAS team positions are designed to expand and contract within ICS. The complexity of the data product, and UAS operations, drive the personnel requirement.

UAS modules may be assembled by ordering single resources and assembling the team on an incident or ordered as a PSURT package (UAS Team Leader, RPIC, Data Specialist, UAS Manager) if available.

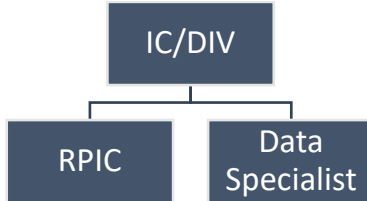
### “Alpha – A” Package

Low complexity data product requirement such as Situational Awareness, small scale acre/perimeter calculation, photos/video. The RPIC is trained to independently provide these products.



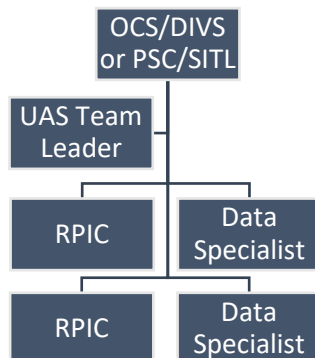
### “Bravo – B” package

Moderate complexity data product requirements supporting small incidents (type 3, 4, or 5): In this scenario, the Data Specialist would either produce the desired product or handoff pre-processed sensor/telemetry data to an assigned (or local) specialist.



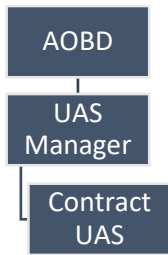
### “Charlie – C” package

High complexity data products supporting large incidents: Large/complex incident may require a mix of UAS products or services and multiple UAS personnel. In this case, a leadership position is activated to provide direction to a team of UAS personnel. The organizational structure will vary depending on the section/unit which requires UAS data collection.



## “Delta – D” Package

The UAS Manager position is activated when a contract UAS resource is mobilized. This typically occurs in large incidents.



## PSURT Mission Ready Package

<b>RESOURCE:</b>	UAS Team		
<b>RESOURCE</b>	Search and Rescue (ESF #9)	<b>KIND:</b>	Search
<b>OVERALL FUNCTION:</b>	A team that performs real time UAS aerial reconnaissance to enhance Commands situational awareness.	<b>COMPOSITION &amp; ORDERING SPECIFICATIONS:</b>	1 RPIC 1 UAS Team Leader 1 Data Specialist 1 Visual Observer (if present) 1 UAS Manager (if required)  If required, law enforcement support, re-supply and shelter for the team must be provided by the requesting agency.

CAPABILITIES:			NOTES:
COMPONENT:	METRIC AND RESPONSE PACKAGE:	DETAILS:	
Personnel	RPIC (A,B, C)	1 PSURT Personnel or equivalent (PSURT qualified)	Should have FAA Part 107 Certification and /or operate under FAA COA
Personnel	Data Specialist (B, C)	1 PSURT Personnel or equivalent (PSURT qualified)	See PSURT UAS Positions and Utilization
Personnel	UAS Team Leader	1 PSURT Personnel or equivalent (PSURT qualified)	See PSURT UAS Positions and Utilization
Personnel	1 Visual Observer (if present) (A, B, or C)	1 PSURT Personnel or equivalent (PSURT qualified)	See PSURT UAS Positions and Utilization
Personnel	1 UAS Manager (if required) (D)	1 PSURT Team Personnel or equivalent (PSURT qualified)	See PSURT UAS Positions and Utilization
Vehicles	Transportation	Vehicle(s) capable of driving Code 3 and transporting personnel with equipment.	1 4WD pickup with tow package capable of pulling trailer.



Appendix K: UAS Modules and Packages (ICS Structure) Example

CAPABILITIES:			NOTES:
COMPONENT:	METRIC AND RESPONSE PACKAGE:	DETAILS:	
Equipment	Materials and supplies	<p>Self-sustaining for 24 hours to include personal protective equipment, food and water.</p> <p>Med kit -BLS level.</p> <p>Discipline specific equipment to accomplish the mission objectives to include:</p> <ul style="list-style-type: none"> <li>• Laptop with wireless internet capability for connectivity</li> <li>• Tech bag                             <ul style="list-style-type: none"> <li>• Lightning cable (IPad) x 2</li> <li>• Micro SD Cards (64 GB x 2) and carrying case</li> <li>• Micro USB (x1)</li> <li>• HDMI micro adaptor x 1</li> <li>• USB thumb drive for distribution x 4</li> <li>• Portable hard drive (1 TB) x1</li> </ul> </li> <li>• Cellular Hot Spot</li> <li>• Cell Phone</li> <li>• Primary Aircraft</li> <li>• Secondary Aircraft (if available)</li> <li>• Payload                             <ul style="list-style-type: none"> <li>• EO Camera</li> <li>• IR Camera (if available)</li> </ul> </li> <li>• Batteries &gt; 1 hr</li> <li>• Extra propellers</li> <li>• Software                             <ul style="list-style-type: none"> <li>• Mapping / modeling – Pix4D</li> <li>• Management / data communications</li> </ul> </li> <li>• Video monitors (ruggedized if available)                             <ul style="list-style-type: none"> <li>• HDMI cords x2</li> <li>• Apple TV (for each monitor)</li> </ul> </li> <li>• Ipad Pro (one for each aircraft)</li> <li>• Sunshade (10' x 10')</li> <li>• Generator / Invertor                             <ul style="list-style-type: none"> <li>• Fuel</li> <li>• Extension cords x 2</li> <li>• Power strip x 1</li> </ul> </li> <li>• Battery charging station for each aircraft</li> <li>• Portable radios                             <ul style="list-style-type: none"> <li>• Motorola 800</li> <li>• BK radio                                     <ul style="list-style-type: none"> <li>○ Extra batteries (minimum x 2 each)</li> </ul> </li> </ul> </li> <li>• Portable table with chairs</li> <li>• Portable lighting (minimum –one headlamp for each personnel)</li> <li>• Landing pad</li> <li>• Maintenance kit (tools, zip ties, soldering iron, glue, and so on)</li> </ul>	

# Appendix L: Manned / Unmanned Operations Agreement Example

## I. Purpose

To enhance the safety, coordination, and effectiveness of manned and unmanned aircraft by providing a method of communication, tracking, and accounting of aerial resources assigned to an incident.

## II. Background

Factors commonly contributing towards conflict of airspace for public safety manned and unmanned aircraft include notification of presence, lack of or poor communications and lack of or inadequate policies, procedures, and training to support interoperability. An accountability system utilized for all incidents where aircraft shall be utilized will help ensure safe, coordinated, and effective response of aerial resources. For an accountability system to work, a commitment must be made by all participating parties that includes:

- A. Incident Commanders responsibility for:
  - 1. Notification to all incident aircraft
  - 2. Tracking / documenting of responding unit response to include aerial resources
  - 3. Utilizing tactical worksheets and incident action plans
- B. Both Manned and Unmanned resources must establish and maintain communications
- C. All aerial resources must establish and maintain:
  - 1. Positive two-way communications
  - 2. Separation Assurance Standards for the demarcation of:
    - i. Altitude
    - ii. Horizontal distance and /or
    - iii. Geographical areas of operation

## III. Policy

- A. Command shall maintain resource accountability for all incidents
- B. Manned aircraft shall take priority and have precedence over airspace
- C. Dispatch shall:

1. Announce UAS operations during incident response
2. Communicate UAS operations to manned aircraft at the time of the request
  - i. If not announced, it is the responsibility of the Remote Pilot in Command to request that dispatch advise all manned aircraft of Unmanned Operations.
- D. Notification of UAS training shall be provided through the Jurisdiction's UAS Department.
- E. Communications between all participating aircraft shall be adhered to for the duration of each incident response.

#### IV. Procedure

- A. When referring to accountability, the following terms shall apply:
  1. Altitude – use Mean Sea Level (MSL) altitude or specify with Above Ground Level (AGL) altitude when appropriate.
  2. Horizontal Distance – refers to the physical measurement between two objects.
  3. Geographical area of operation – refers to:
    - i. A physical description of a location, or
    - ii. Identification by GPS coordinates
- B. Communications:
  1. During both training and emergency incident response, radio communications shall be established and maintained between both the manned and the unmanned aircraft operators.
  2. A Tactical (TAC) operations channel shall be assigned to emergency response incidents within the jurisdiction. Normally, all air operations communications (manned and unmanned) will be acknowledged on the assigned TAC channel. All Manned and Unmanned operations will be conducted on the assigned air-to-air VHF frequency.
  3. Alternate Radio Channels include
    - i. <Channel A>
    - ii. <Channel B>
  4. If air-to-air communications have not been established, the UAS operator shall land the UAS immediately upon hearing or seeing any public safety aircraft and shall remain on the ground until positive communication has been established and can further be maintained.
- C. Separation assurance Standards
  1. The FAA mandated ceiling for UAS operations is 400' AGL unless operating within a 400' radius of a structure in which case the ceiling is 400' above the structure's immediate uppermost limit.

- i. Most UAS operations take place at or below 200' AGL.
2. Manned Aircraft shall not fly below 500' AGL without communications with crew of unmanned aircraft
  - i. Exception to this separation assurance shall be determined through the Incident Commander communicating UAS Operations with manned aircraft.
3. At no time will UAS operations be conducted over manned aircraft.
4. When working in a joint airspace, safe separation of all aircraft shall be maintained through altitude, horizontal distance, and / or geographical areas of operation such as roads, rivers, or other natural dividing lines to de-conflict the air space. The pilot and UAS operator shall establish and maintain direct communication and develop the necessary separation clearances.
5. The following shall be established:
  - i. UAS pilot location
  - ii. UAS location
  - iii. Airspace between UAS pilot and UAS for return to home (RTH) belong to UAS operations
  - iv. Minimum altitude for manned aircraft / max altitude for unmanned aircraft
6. If separation cannot be maintained, the UAS operators shall provide right-of-way to the manned aircraft and return to their respective landing areas until such time as the flight safety can be re-established and maintained.

D. Point of interest (POI) or target designation

1. Location of POI or targets shall be communicated using geographic areas of operation or GPS coordinates.
  - i. GPS format shall be degrees and decimal minutes (DDM)

**Example: DDD° MM.MM'**

**N 30° 19.27' W 097° 39.45'**

# Appendix M: UAS Presidential Memorandum

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release

February 15, 2015

February 15, 2015

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Promoting Economic Competitiveness While  
Safeguarding Privacy, Civil Rights, and  
Civil Liberties in Domestic Use of  
Unmanned Aircraft Systems

Unmanned Aircraft Systems (UAS) technology continues to improve rapidly, and increasingly UAS are able to perform a variety of missions with greater operational flexibility and at a lower cost than comparable manned aircraft. A wide spectrum of domestic users -- including industry, private citizens, and Federal, State, local, tribal, and territorial governments -- are using or expect to use these systems, which may play a transformative role in fields as diverse as urban infrastructure management, farming, public safety, coastal security, military training, search and rescue, and disaster response.

The Congress recognized the potential wide-ranging benefits of UAS operations within the United States in the FAA Modernization and Reform Act of 2012 (Public Law 112-95), which requires a plan to safely integrate civil UAS into the National Airspace System (NAS) by September 30, 2015. As compared to manned aircraft, UAS may provide lower-cost operation and augment existing capabilities while reducing risks to human life. Estimates suggest the positive economic impact to U.S. industry of the integration of UAS into the NAS could be substantial and likely will grow for the foreseeable future.

As UAS are integrated into the NAS, the Federal Government will take steps to ensure that the integration takes into account not only our economic competitiveness and public safety, but also the privacy, civil rights, and civil liberties concerns these systems may raise.

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to establish transparent principles that govern the Federal Government's use of UAS in the NAS, and to promote the responsible use of this technology in the private and commercial sectors, it is hereby ordered as follows:

Section 1. UAS Policies and Procedures for Federal Government Use. The Federal Government currently operates UAS in the United States for several purposes, including to manage Federal lands, monitor wildfires, conduct scientific research, monitor our borders, support law enforcement, and effectively train our military. As with information collected by the Federal Government using any technology, where UAS is the platform for collection, information must be collected, used, retained, and disseminated consistent with the Constitution,

Federal law, and other applicable regulations and policies. Agencies must, for example, comply with the Privacy Act of 1974 (5 U.S.C. 552a) (the "Privacy Act"), which, among other things, restricts the collection and dissemination of individuals' information that is maintained in systems of records, including personally identifiable information (PII), and permits individuals to seek access to and amendment of records.

(a) Privacy Protections. Particularly in light of the diverse potential uses of UAS in the NAS, expected advancements in UAS technologies, and the anticipated increase in UAS use in the future, the Federal Government shall take steps to ensure that privacy protections and policies relative to UAS continue to keep pace with these developments. Accordingly, agencies shall, prior to deployment of new UAS technology and at least every 3 years, examine their existing UAS policies and procedures relating to the collection, use, retention, and dissemination of information obtained by UAS, to ensure that privacy, civil rights, and civil liberties are protected. Agencies shall update their policies and procedures, or issue new policies and procedures, as necessary. In addition to requiring compliance with the Privacy Act in applicable circumstances, agencies that collect information through UAS in the NAS shall ensure that their policies and procedures with respect to such information incorporate the following requirements:

(i) Collection and Use. Agencies shall only collect information using UAS, or use UAS-collected information, to the extent that such collection or use is consistent with and relevant to an authorized purpose.

(ii) Retention. Information collected using UAS that may contain PII shall not be retained for more than 180 days unless retention of the information is determined to be necessary to an authorized mission of the retaining agency, is maintained in a system of records covered by the Privacy Act, or is required to be retained for a longer period by any other applicable law or regulation.

(iii) Dissemination. UAS-collected information that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the agency unless dissemination is required by law, or fulfills an authorized purpose and complies with agency requirements.

(b) Civil Rights and Civil Liberties Protections. To protect civil rights and civil liberties, agencies shall:

(i) ensure that policies are in place to prohibit the collection, use, retention, or dissemination of data in any manner that would violate the First Amendment or in any manner that would discriminate against persons based upon their ethnicity, race, gender, national origin, religion, sexual orientation, or gender identity, in violation of law;

(ii) ensure that UAS activities are performed in a manner consistent with the Constitution and applicable

laws, Executive Orders, and other Presidential directives; and

(iii) ensure that adequate procedures are in place to receive, investigate, and address, as appropriate, privacy, civil rights, and civil liberties complaints.

(c) Accountability. To provide for effective oversight, agencies shall:

(i) ensure that oversight procedures for agencies' UAS use, including audits or assessments, comply with existing agency policies and regulations;

(ii) verify the existence of rules of conduct and training for Federal Government personnel and contractors who work on UAS programs, and procedures for reporting suspected cases of misuse or abuse of UAS technologies;

(iii) establish policies and procedures, or confirm that policies and procedures are in place, that provide meaningful oversight of individuals who have access to sensitive information (including any PII) collected using UAS;

(iv) ensure that any data-sharing agreements or policies, data use policies, and record management policies applicable to UAS conform to applicable laws, regulations, and policies;

(v) establish policies and procedures, or confirm that policies and procedures are in place, to authorize the use of UAS in response to a request for UAS assistance in support of Federal, State, local, tribal, or territorial government operations; and

(vi) require that State, local, tribal, and territorial government recipients of Federal grant funding for the purchase or use of UAS for their own operations have in place policies and procedures to safeguard individuals' privacy, civil rights, and civil liberties prior to expending such funds.

(d) Transparency. To promote transparency about their UAS activities within the NAS, agencies that use UAS shall, while not revealing information that could reasonably be expected to compromise law enforcement or national security:

(i) provide notice to the public regarding where the agency's UAS are authorized to operate in the NAS;

(ii) keep the public informed about the agency's UAS program as well as changes that would significantly affect privacy, civil rights, or civil liberties; and

(iii) make available to the public, on an annual basis, a general summary of the agency's UAS operations during the previous fiscal year, to include a brief description of types or categories of missions flown, and the number of times the agency provided assistance to other agencies, or to State, local, tribal, or territorial governments.

(e) Reports. Within 180 days of the date of this memorandum, agencies shall provide the President with a status report on the implementation of this section. Within 1 year of the date of this memorandum, agencies shall publish information on how to access their publicly available policies and procedures implementing this section.

Sec. 2. Multi-stakeholder Engagement Process. In addition to the Federal uses of UAS described in section 1 of this memorandum, the combination of greater operational flexibility, lower capital requirements, and lower operating costs could allow UAS to be a transformative technology in the commercial and private sectors for fields as diverse as urban infrastructure management, farming, and disaster response. Although these opportunities will enhance American economic competitiveness, our Nation must be mindful of the potential implications for privacy, civil rights, and civil liberties. The Federal Government is committed to promoting the responsible use of this technology in a way that does not diminish rights and freedoms.

(a) There is hereby established a multi-stakeholder engagement process to develop and communicate best practices for privacy, accountability, and transparency issues regarding commercial and private UAS use in the NAS. The process will include stakeholders from the private sector.

(b) Within 90 days of the date of this memorandum, the Department of Commerce, through the National Telecommunications and Information Administration, and in consultation with other interested agencies, will initiate this multi-stakeholder engagement process to develop a framework regarding privacy, accountability, and transparency for commercial and private UAS use. For this process, commercial and private use includes the use of UAS for commercial purposes as civil aircraft, even if the use would qualify a UAS as a public aircraft under 49 U.S.C. 40102(a)(41) and 40125. The process shall not focus on law enforcement or other noncommercial governmental use.

Sec. 3. Definitions. As used in this memorandum:

(a) "Agencies" means executive departments and agencies of the Federal Government that conduct UAS operations in the NAS.

(b) "Federal Government use" means operations in which agencies operate UAS in the NAS. Federal Government use includes agency UAS operations on behalf of another agency or on behalf of a State, local, tribal, or territorial government, or when a nongovernmental entity operates UAS on behalf of an agency.

(c) "National Airspace System" means the common network of U.S. airspace; air navigation facilities, equipment, and services; airports or landing areas; aeronautical charts, information, and services; related rules, regulations, and procedures; technical information; and manpower and material. Included in this definition are system components shared jointly by the Departments of Defense, Transportation, and Homeland Security.

(d) "Unmanned Aircraft System" means an unmanned aircraft (an aircraft that is operated without direct human intervention from within or on the aircraft) and associated elements



(including communication links and components that control the unmanned aircraft) that are required for the pilot or system operator in command to operate safely and efficiently in the NAS.

(e) "Personally identifiable information" refers to information that can be used to distinguish or trace an individual's identity, either alone or when combined with other personal or identifying information that is linked or linkable to a specific individual, as set forth in Office of Management and Budget Memorandum M-07-16 (May 22, 2007) and Office of Management and Budget Memorandum M-10-23 (June 25, 2010).

Sec. 4. General Provisions. (a) This memorandum complements and is not intended to supersede existing laws and policies for UAS operations in the NAS, including the National Strategy for Aviation Security and its supporting plans, the FAA Modernization and Reform Act of 2012, the Federal Aviation Administration's (FAA's) Integration of Civil UAS in the NAS Roadmap, and the FAA's UAS Comprehensive Plan.

(b) This memorandum shall be implemented consistent with applicable law, and subject to the availability of appropriations.

(c) Nothing in this memorandum shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department, agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(d) Independent agencies are strongly encouraged to comply with this memorandum.

(e) This memorandum is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

(f) The Secretary of Commerce is hereby authorized and directed to publish this memorandum in the *Federal Register*.

BARACK OBAMA

# # #

## Appendix N: Texas Government Code 423: Use of Unmanned Aircraft

Sec. 423.001. DEFINITION. In this chapter, "image" means 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.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.002. NONAPPLICABILITY. (a) It is lawful to capture an image using an unmanned aircraft in this state:

(1) for the purpose of professional or scholarly research and development or for another academic purpose by a person acting on behalf of an institution of higher education or a private or independent institution of higher education, as those terms are defined by Section [61.003](#), Education Code, including a person who:

(A) is a professor, employee, or student of the institution; or

(B) is under contract with or otherwise acting under the direction or on behalf of the institution;

(2) in airspace designated as a test site or range authorized by the Federal Aviation Administration for the purpose of integrating unmanned aircraft systems into the national airspace;

(3) as part of an operation, exercise, or mission of any branch of the United States military;

(4) if the image is captured by a satellite for the purposes of mapping;

(5) if the image is captured by or for an electric or natural gas utility or a telecommunications provider:

(A) for operations and maintenance of utility or telecommunications facilities for the purpose of maintaining utility or telecommunications system reliability and integrity;

(B) for inspecting utility or telecommunications facilities to determine repair, maintenance, or replacement needs during and after construction of such facilities;

(C) for assessing vegetation growth for the purpose of maintaining clearances on utility or telecommunications easements; and

(D) for utility or telecommunications facility routing and siting for the purpose of providing utility or telecommunications service;

(6) with the consent of the individual who owns or lawfully occupies the real property captured in the image;

(7) pursuant to a valid search or arrest warrant;

(8) if the image is captured by a law enforcement authority or a person who is under contract with or otherwise acting under the direction or on behalf of a law enforcement authority:

(A) in immediate pursuit of a person law enforcement officers have reasonable suspicion or probable cause to suspect has committed an offense, not including misdemeanors or offenses punishable by a fine only;

(B) for the purpose of documenting a crime scene where an offense, not including misdemeanors or offenses punishable by a fine only, has been committed;

(C) for the purpose of investigating the scene of:

(i) a human fatality;

(ii) a motor vehicle accident causing death or serious bodily injury to a person; or

(iii) any motor vehicle accident on a state highway or federal interstate or highway;

(D) in connection with the search for a missing person;

(E) for the purpose of conducting a high-risk tactical operation that poses a threat to human life;

(F) of private property that is generally open to the public where the property owner consents to law enforcement public safety responsibilities; or

(G) of real property or a person on real property that is within 25 miles of the United States border for the sole purpose of ensuring border security;

(9) if the image is captured by state or local law enforcement authorities, or a person who is under contract with or otherwise acting under the direction or on behalf of state authorities, for the purpose of:

(A) surveying the scene of a catastrophe or other damage to determine whether a state of emergency should be declared;

(B) preserving public safety, protecting property, or surveying damage or contamination during a lawfully declared state of emergency; or

(C) conducting routine air quality sampling and monitoring, as provided by state or local law;

(10) at the scene of a spill, or a suspected spill, of hazardous materials;

(11) for the purpose of fire suppression;

(12) for the purpose of rescuing a person whose life or well-being is in imminent danger;

(13) if the image is captured by a Texas licensed real estate broker in connection with the marketing, sale, or financing of real property, provided that no individual is identifiable in the image;

(14) from a height no more than eight feet above ground level in a public place, if the image was captured without using any electronic, mechanical, or other means to amplify the image beyond normal human perception;

(15) of public real property or a person on that property;

(16) if the image is captured by the owner or operator of an oil, gas, water, or other pipeline for the purpose of inspecting, maintaining, or repairing pipelines or other related facilities, and is captured without the intent to conduct surveillance on an individual or real property located in this state;

(17) in connection with oil pipeline safety and rig protection;

(18) in connection with port authority surveillance and security;

(19) if the image is captured by a registered professional land surveyor in connection with the practice of professional surveying, as those terms are defined by Section [1071.002](#), Occupations Code, provided that no individual is identifiable in the image;

(20) if the image is captured by a professional engineer licensed under Subchapter G, Chapter [1001](#), Occupations Code, in connection with the practice of engineering, as defined by Section [1001.003](#), Occupations Code, provided that no individual is identifiable in the image; or

(21) if:

(A) the image is captured by an employee of an insurance company or of an affiliate of the company in connection with the underwriting of an insurance policy, or the rating or adjusting of an insurance claim, regarding real property or a structure on real property; and

(B) the operator of the unmanned aircraft is authorized by the Federal Aviation Administration to conduct operations within the airspace from which the image is captured.

(b) This chapter does not apply to the manufacture, assembly, distribution, or sale of an unmanned aircraft.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Amended by:

Acts 2015, 84th Leg., R.S., Ch. 360 (H.B. [2167](#)), Sec. 1, eff. September 1, 2015.

Acts 2017, 85th Leg., R.S., Ch. 583 (S.B. [840](#)), Sec. 1, eff. September 1, 2017.

Sec. 423.003. OFFENSE: ILLEGAL USE OF UNMANNED AIRCRAFT TO CAPTURE IMAGE. (a) A person commits an offense if the person uses an unmanned aircraft to capture an image of an individual or privately owned real property in this state with the intent to conduct surveillance on the individual or property captured in the image.

(b) An offense under this section is a Class C misdemeanor.

(c) It is a defense to prosecution under this section that the person destroyed the image:

(1) as soon as the person had knowledge that the image was captured in violation of this section; and

(2) without disclosing, displaying, or distributing the image to a third party.

(d) In this section, "intent" has the meaning assigned by Section [6.03](#), Penal Code.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.004. OFFENSE: POSSESSION, DISCLOSURE, DISPLAY, DISTRIBUTION, OR USE OF IMAGE. (a) A person commits an offense if the person:

- (1) captures an image in violation of Section [423.003](#); and
- (2) possesses, discloses, displays, distributes, or otherwise uses that image.

(b) An offense under this section for the possession of an image is a Class C misdemeanor. An offense under this section for the disclosure, display, distribution, or other use of an image is a Class B misdemeanor.

(c) Each image a person possesses, discloses, displays, distributes, or otherwise uses in violation of this section is a separate offense.

(d) It is a defense to prosecution under this section for the possession of an image that the person destroyed the image as soon as the person had knowledge that the image was captured in violation of Section [423.003](#).

(e) It is a defense to prosecution under this section for the disclosure, display, distribution, or other use of an image that the person stopped disclosing, displaying, distributing, or otherwise using the image as soon as the person had knowledge that the image was captured in violation of Section [423.003](#).

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.0045. OFFENSE: OPERATION OF UNMANNED AIRCRAFT OVER CORRECTIONAL FACILITY, DETENTION FACILITY, OR CRITICAL INFRASTRUCTURE FACILITY. (a) In this section:

(1) "Correctional facility" means:

(A) a confinement facility operated by or under contract with any division of the Texas Department of Criminal Justice;

(B) a municipal or county jail;

(C) a confinement facility operated by or under contract with the Federal Bureau of Prisons; or

(D) a secure correctional facility or secure detention facility, as defined by Section [51.02](#), Family Code.

(1-a) "Critical infrastructure facility" means:

(A) one of the following, if completely enclosed by a fence or other physical barrier that is obviously designed to exclude intruders, or if clearly marked with a sign or signs that are posted on the property, are reasonably likely to come to the attention of intruders, and indicate that entry is forbidden:

(i) a petroleum or alumina refinery;

(ii) an electrical power generating facility, substation, switching station, or electrical control center;

(iii) a chemical, polymer, or rubber manufacturing facility;

(iv) a water intake structure, water treatment facility, wastewater treatment plant, or pump station;

(v) a natural gas compressor station;

(vi) a liquid natural gas terminal or storage facility;

(vii) a telecommunications central switching office or any structure used as part of a system to provide wired or wireless telecommunications services;

(viii) a port, railroad switching yard, trucking terminal, or other freight transportation facility;

(ix) a gas processing plant, including a plant used in the processing, treatment, or fractionation of natural gas;

(x) a transmission facility used by a federally licensed radio or television station;

(xi) a steelmaking facility that uses an electric arc furnace to make steel;

(xii) a dam that is classified as a high hazard by the Texas Commission on Environmental Quality; or

(xiii) a concentrated animal feeding operation, as defined by Section [26.048](#), Water Code; or

(B) if enclosed by a fence or other physical barrier obviously designed to exclude intruders:

(i) any portion of an aboveground oil, gas, or chemical pipeline;

(ii) an oil or gas drilling site;

(iii) a group of tanks used to store crude oil, such as a tank battery;

(iv) an oil, gas, or chemical production facility;

(v) an oil or gas wellhead; or

(vi) any oil and gas facility that has an active flare.

(2) "Dam" means any barrier, including any appurtenant structures, that is constructed for the purpose of permanently or temporarily impounding water.

(3) "Detention facility" means a facility operated by or under contract with United States Immigration and Customs Enforcement for the purpose of detaining aliens and placing them in removal proceedings.

(b) A person commits an offense if the person intentionally or knowingly:

(1) operates an unmanned aircraft over a correctional facility, detention facility, or critical infrastructure facility and the unmanned aircraft is not higher than 400 feet above ground level;

(2) allows an unmanned aircraft to make contact with a correctional facility, detention facility, or critical infrastructure facility, including any person or object on the premises of or within the facility; or

(3) allows an unmanned aircraft to come within a distance of a correctional facility, detention facility, or critical infrastructure facility that is close enough to interfere with the operations of or cause a disturbance to the facility.

(c) This section does not apply to:

(1) conduct described by Subsection (b) that involves a correctional facility, detention facility, or critical infrastructure facility and is committed by:

(A) the federal government, the state, or a governmental entity;

(B) a person under contract with or otherwise acting under the direction or on behalf of the federal government, the state, or a governmental entity;

(C) a law enforcement agency;

(D) a person under contract with or otherwise acting under the direction or on behalf of a law enforcement agency; or

(E) an operator of an unmanned aircraft that is being used for a commercial purpose, if the operation is conducted in compliance with:

(i) each applicable Federal Aviation Administration rule, restriction, or exemption; and

(ii) all required Federal Aviation Administration authorizations; or

(2) conduct described by Subsection (b) that involves a critical infrastructure facility and is committed by:

(A) an owner or operator of the critical infrastructure facility;

(B) a person under contract with or otherwise acting under the direction or on behalf of an owner or operator of the critical infrastructure facility;

(C) a person who has the prior written consent of the owner or operator of the critical infrastructure facility; or

(D) the owner or occupant of the property on which the critical infrastructure facility is located or a person who has the prior written consent of the owner or occupant of that property.

(d) An offense under this section is a Class B misdemeanor, except that the offense is a Class A misdemeanor if the actor has previously been convicted under this section or Section [423.0046](#).

Added by Acts 2015, 84th Leg., R.S., Ch. 1033 (H.B. [1481](#)), Sec. 1, eff. September 1, 2015.

Amended by:

Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 1, eff. September 1, 2017.

Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 2, eff. September 1, 2017.

Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 1, eff. September 1, 2017.

Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 2, eff. September 1, 2017.

Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 3, eff. September 1, 2017.

Acts 2019, 86th Leg., R.S., Ch. 467 (H.B. [4170](#)), Sec. 8.011(a), eff. September 1, 2019.

Acts 2019, 86th Leg., R.S., Ch. 467 (H.B. [4170](#)), Sec. 8.011(b), eff. September 1, 2019.

Acts 2019, 86th Leg., R.S., Ch. 467 (H.B. [4170](#)), Sec. 8.012, eff. September 1, 2019.

Acts 2019, 86th Leg., R.S., Ch. 1297 (H.B. [3557](#)), Sec. 3, eff. September 1, 2019.

Acts 2019, 86th Leg., R.S., Ch. 1297 (H.B. [3557](#)), Sec. 4, eff. September 1, 2019.

Sec. 423.0046. OFFENSE: OPERATION OF UNMANNED AIRCRAFT OVER SPORTS VENUE. (a)

In this section, "sports venue" means an arena, automobile racetrack, coliseum, stadium, or other type of area or facility that:

- (1) has a seating capacity of 30,000 or more people; and
- (2) is primarily used for one or more professional or amateur sports or athletics events.

(b) A person commits an offense if the person intentionally or knowingly operates an unmanned aircraft over a sports venue and the unmanned aircraft is not higher than 400 feet above ground level.

(c) This section does not apply to conduct described by Subsection (b) that is committed by:

- (1) the federal government, the state, or a governmental entity;
- (2) a person under contract with or otherwise acting under the direction or on behalf of the federal government, the state, or a governmental entity;
- (3) a law enforcement agency;
- (4) a person under contract with or otherwise acting under the direction or on behalf of a law enforcement agency;
- (5) an operator of an unmanned aircraft that is being used for a commercial purpose, if the operation is conducted in compliance with:

(A) each applicable Federal Aviation Administration rule, restriction, or exemption;

and

(B) all required Federal Aviation Administration authorizations;

- (6) an owner or operator of the sports venue;
- (7) a person under contract with or otherwise acting under the direction or on behalf of an owner or operator of the sports venue; or
- (8) a person who has the prior written consent of the owner or operator of the sports venue.

(d) An offense under this section is a Class B misdemeanor, except that the offense is a Class A misdemeanor if the actor has previously been convicted under this section or Section [423.0045](#).

Added by Acts 2017, 85th Leg., R.S., Ch. 1010 (H.B. [1424](#)), Sec. 4, eff. September 1, 2017.

Sec. 423.005. ILLEGALLY OR INCIDENTALLY CAPTURED IMAGES NOT SUBJECT TO

DISCLOSURE. (a) Except as otherwise provided by Subsection (b), an image captured in violation of Section [423.003](#), or an image captured by an unmanned aircraft that was incidental to the lawful capturing of an image:



(1) may not be used as evidence in any criminal or juvenile proceeding, civil action, or administrative proceeding;

(2) is not subject to disclosure, inspection, or copying under Chapter [552](#); and

(3) is not subject to discovery, subpoena, or other means of legal compulsion for its release.

(b) An image described by Subsection (a) may be disclosed and used as evidence to prove a violation of this chapter and is subject to discovery, subpoena, or other means of legal compulsion for that purpose.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.006. CIVIL ACTION. (a) An owner or tenant of privately owned real property located in this state may bring against a person who, in violation of Section [423.003](#), captured an image of the property or the owner or tenant while on the property an action to:

(1) enjoin a violation or imminent violation of Section [423.003](#) or [423.004](#);

(2) recover a civil penalty of:

(A) \$5,000 for all images captured in a single episode in violation of Section [423.003](#);

or

(B) \$10,000 for disclosure, display, distribution, or other use of any images captured in a single episode in violation of Section [423.004](#); or

(3) recover actual damages if the person who captured the image in violation of Section [423.003](#) discloses, displays, or distributes the image with malice.

(b) For purposes of recovering the civil penalty or actual damages under Subsection (a), all owners of a parcel of real property are considered to be a single owner and all tenants of a parcel of real property are considered to be a single tenant.

(c) In this section, "malice" has the meaning assigned by Section [41.001](#), Civil Practice and Remedies Code.

(d) In addition to any civil penalties authorized under this section, the court shall award court costs and reasonable attorney's fees to the prevailing party.

(e) Venue for an action under this section is governed by Chapter [15](#), Civil Practice and Remedies Code.

(f) An action brought under this section must be commenced within two years from the date the image was:

(1) captured in violation of Section [423.003](#); or

(2) initially disclosed, displayed, distributed, or otherwise used in violation of Section [423.004](#).

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.007. RULES FOR USE BY LAW ENFORCEMENT. The Department of Public Safety shall adopt rules and guidelines for use of an unmanned aircraft by a law enforcement authority in this state.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

Sec. 423.008. REPORTING BY LAW ENFORCEMENT AGENCY. (a) Not earlier than January 1 and not later than January 15 of each odd-numbered year, each state law enforcement agency and each county or municipal law enforcement agency located in a county or municipality, as applicable, with a population greater than 150,000, that used or operated an unmanned aircraft during the preceding 24 months shall issue a written report to the governor, the lieutenant governor, and each member of the legislature and shall:

(1) retain the report for public viewing; and

(2) post the report on the law enforcement agency's publicly accessible website, if one exists.

(b) The report must include:

(1) the number of times an unmanned aircraft was used, organized by date, time, location, and the types of incidents and types of justification for the use;

(2) the number of criminal investigations aided by the use of an unmanned aircraft and a description of how the unmanned aircraft aided each investigation;

(3) the number of times an unmanned aircraft was used for a law enforcement operation other than a criminal investigation, the dates and locations of those operations, and a description of how the unmanned aircraft aided each operation;

(4) the type of information collected on an individual, residence, property, or area that was not the subject of a law enforcement operation and the frequency of the collection of this information; and

(5) the total cost of acquiring, maintaining, repairing, and operating or otherwise using each unmanned aircraft for the preceding 24 months.

Added by Acts 2013, 83rd Leg., R.S., Ch. 1390 (H.B. [912](#)), Sec. 2, eff. September 1, 2013.

**Note:** For report examples, see [Code 423 Sec. 423.008 Report Examples](#).

Sec. 423.009. REGULATION OF UNMANNED AIRCRAFT BY POLITICAL SUBDIVISION. (a) In this section:

(1) "Political subdivision" includes a county, a joint board created under Section [22.074](#), Transportation Code, and a municipality.

(2) "Special event" means a festival, celebration, or other gathering that:

(A) involves:

(i) the reservation and temporary use of all or a portion of a public park, road, or other property of a political subdivision; and

(ii) entertainment, the sale of merchandise, food, or beverages, or mass participation in a sports event; and

(B) requires a significant use or coordination of a political subdivision's services.

(b) Except as provided by Subsection (c), a political subdivision may not adopt or enforce any ordinance, order, or other similar measure regarding the operation of an unmanned aircraft.

(c) A political subdivision may adopt and enforce an ordinance, order, or other similar measure regarding:

- (1) the use of an unmanned aircraft during a special event;
- (2) the political subdivision's use of an unmanned aircraft; or
- (3) the use of an unmanned aircraft near a facility or infrastructure owned by the political subdivision, if the political subdivision:

(A) applies for and receives authorization from the Federal Aviation Administration to adopt the regulation; and

(B) after providing reasonable notice, holds a public hearing on the political subdivision's intent to apply for the authorization.

(d) An ordinance, order, or other similar measure that violates Subsection (b) is void and unenforceable.

Added by Acts 2017, 85th Leg., R.S., Ch. 824 (H.B. [1643](#)), Sec. 3, eff. September 1, 2017.

## Code 423 Sec. 423.008 Report Examples

When a jurisdiction submits the report, they are also required to post it publicly on their website; therefore, to see other examples, search the websites of larger cities (population >150,000) for other report examples.


<b>UAS LEGISLATIVE REPORT</b>						
<b>DEPARTMENT NAME</b>						
<b>Date &amp; Time</b>	<b>Location</b>	<b>Purpose</b>	<b>Criminal</b>	<b>Description</b>	<b>Info Collected</b>	<b>Yes Info</b>
8/23/2021	San Antonio	Flight Training	No	Training	No	
8/25/2021	Austin	Disaster Reconnaissance (Flood)	No	Provide Situational Awareness for flooding on I-35	Yes	Photos of flood damage
9/2/2021	Grapevine	Flight Training	No	Basic Training	No	

## FY21 UAS REPORT AIRCRAFT

Aircraft Make and Model	Evo II Dual
Serial Number	KV29574828Y7
Purchase Price	\$8,599.00
Purchase Date	12/7/2021
FAA Registration	FA8NKP7NTD
Base of Operations	AUS (Region 7)

Date	Crew	Vicinity Of	Hrs	Purpose
8/12/2021	Joe Smith	Austin, TX	1.25	Flight Training
8/14/2021	Joe Smith	San Antonio, TX	0.50	Search (Missing Person)
8/14/2021	Joe Smith	San Antonio, TX	1.04	Search (Missing Person)
9/2/2021	Joe Smith	Fort Worth, TX	0.45	Flight Training

# Appendix O: Special Government Interest (SGI) Submission Form Example



**FAA**  
Air Traffic Organization  
System Operations Security

## FAA REQUEST FORM FOR EXPEDITED SGI WAIVER OR AUTHORIZATION FOR UAS OPERATION

### Basic Qualifications

- The requesting operator must possess a Certificate of Waiver or Authorization (COA) or Part 107 Pilot License
- The UAS operation must support an emergency response or other effort being conducted to address exigent circumstances and that will benefit the public good
- The requested FAA approval cannot be secured via normal processes in time to meet urgent operational needs

### Operator Information **Mandatory entry**

Operator Organization (e.g., agency or company)

Operator Address

Operator Point-of Contact (including name, office + mobile phone number, and email)

Pilot and Observers (including names, mobile phone numbers, and emails)

Type of UAS

### Documentation

If the requested UAS operation will be flown under a pre-existing COA, please attach it hereto and provide the COA number below.

If the request UAS operation will be flow under Part 107, please provide the Part 107 Pilot License number below.

### Requested Flight Details

Enter the date(s) of the proposed UAS operation (e.g., 03/18/2018 or 03/18/2018-03/21/2018) **Mandatory entry**

Enter the times of the proposed UAS operation (be sure to confirm time zone; e.g., 1200L-1400L daily) **Mandatory entry**

Enter the location of the proposed flight (reference the nearest city or town, and state; e.g., Gulfport, MS)

Enter the distance and direction from the nearest airport, and FAA identification of the same (e.g., 6 NM W of GPT)

Identify the class(es) of airspace in which the flight will be conducted (e.g., Class G/E/D/C/B/A)

SOSC 2018/03/14 1235Z

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Requested altitude of UAS flight: <b>Mandatory entry</b>	
Enter GIS details defining location of proposed flight (only one area type description needed) <b>Mandatory entry</b>	
For those flights remaining within a general contiguous area, which can be described as a circular polygon, provide the latitude and longitude, expressed as <b>degrees/minutes/seconds</b> , of the center of that area and the radius of that same area (e.g., XX:XX:XXN / XXX:XX:XXW - .25NM radius)	
For those flights remaining within a general contiguous area, which cannot be easily described as a circular polygon, provide the latitude and longitude, expressed as <b>degrees/minutes/seconds</b> , of the vertices of the general area starting with the most northerly point and then progressing clockwise (e.g., (XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW)	
For those flights following an extended route, provide the latitude and longitude, expressed as <b>degrees/minutes/seconds</b> , of the key waypoints of the route, and, as appropriate provide the width of the route (e.g., XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW - .25NM wide)	
Nature and Description of Event	
Enter the type of urgent UAS operation to be flown	Description of event
<input type="checkbox"/> Firefighting <input type="checkbox"/> Law Enforcement <input type="checkbox"/> Search and Rescue	
<input type="checkbox"/> Local / National / Natural Disaster	
<input type="checkbox"/> Other (specify below)	
Additional Pilot Qualifications	
Enter additional pilot qualifications	
<input type="checkbox"/> Sport/Recreational/Private pilot certificate	
<input type="checkbox"/> Commercial/Airline pilot certificate	
<input type="checkbox"/> Flight instructor certificate	
Contacting the SOSC	
The SOSC office and email are staffed/monitored 0600-2400 Eastern Time. For all emergencies, please follow up any email with a phone call to 202-267-8276, which is answered <b>24/7</b> .	
SOSC 2018/03/14 12352	2   2

