Arlington Texas Police Department policy on the use of Unmanned Aircraft System (SUAS)

I. PURPOSE:

The Arlington Texas Police Department has implemented a small unmanned aircraft system ("sUAS") program to assist law enforcement in providing situation awareness. This policy sets forth how the sUAS program will operate the aircraft in coordination with law enforcement officers conducting a specific mission. This policy is designed to minimize risk to people, property, and aircraft during the operation of the sUAS.

II. DEFINITIONS:

a. Mission Commander - The individual responsible for reviewing and approving the use of the sUAS in a law enforcement mission.

b. Pilot in Command – The individual responsible for the overall flight operations of a specific mission. The Pilot in Command has final authority as to all flight operational issues, including the final go/no-go decision.

c. Observer – The individual trained to assist the Pilot in Command in carrying out all duties required for the safe operation of the sUAS.

d. Program Manager - The individual responsible for managing all aspects related to the use of sUAS and law enforcement missions.

III. POLICY:

a. Aircraft:

i. Airworthiness – The Mission Commander shall be responsible for ensuring that the sUAS is airworthy prior to each mission. The Mission Commander may rely upon the inspection and reports provided by agency personnel responsible for maintaining the sUAS. In addition, the Mission Commander may rely upon the testing data and evaluation data provided by other government agencies, the aircraft manufacturer, and consultant.

ii. Maintenance – All maintenance shall be performed by agency personnel specifically trained on the maintenance of the sUAS or by manufacturer certified representatives and personnel. The sUAS will undergo a preflight and post flight inspection. Any squawks or discrepancies will be entered in the aircraft's log and reported to the sUAS Program Manager. It shall be the responsibility of the sUAS Program Manager and Mission Commander to determine whether the reported squawks or discrepancies need to be corrected prior to the next flight.

iii. Storage – the sUAS shall be stored in a secure location accessible only by sUAS program participants. The aircraft shall be stored in a secure manner to limit possible damage to the unit while in transit. The system should be stored in temperatures from 60 degrees to 80 degrees, with limited moisture and covered conditions. The system should also be limited to dust and dirt conditions.

iv. Battery Charge – Any components necessitating a charged battery shall be charged in accordance with manufacturer's recommendations. To the extent permissible by manufacturer's recommendations, the sUAS shall be fully charged when not in use.

b. Pilot:

i. All pilots who will be flying law enforcement missions shall be properly trained by either manufacturer representatives or individuals designated by the sUAS Program Manager. The sUAS pilots will be FAA certified pilots with second-class medical certificates. The pilots will have a current working knowledge of the airspace intended for operations, air traffic control communication requirements, specific sUAS aerodynamic factors, and the ability to obtain and interpret weather. All pilots must meet the currency requirements and must meet the following flight experience requirements:

1. Specific sUAS Model Experience: All pilots must have at least 10 hours of flight time in the sUAS model and 20 launch and recovery operations in the SUAS model prior to flying the aircraft in a mission. In addition to basic aircraft operations, appropriate training shall include a review of communications, emergency procedures and mission limitations. The Pilot shall also meet the currency requirements as set forth below.

2. Initial Mission Training: All pilots must undergo mission training. Mission training is additional training beyond basic flight operations. Mission training shall include:
    a. Preflight preparation
    b. Preflight briefing for Observer
    c. Communications between pilot and Observer
    d. Standard surveillance patterns

3. Surveillance Missions: A pilot must have logged 20 flight hours as Pilot in Command before flying surveillance. An Observer shall have logged at least 10 hours as an Observer prior to acting as a primary Observer on a surveillance mission.

4. Search and Rescue Missions: A pilot must have logged 20 flight hours as Pilot in Command before flying search and rescue. An Observer shall have logged at least 10 hours as an Observer prior to acting as a primary Observer on a search and rescue missions.

5. Prohibited Acts:

    a. Exceeding Aircraft Limitations: The sUAS shall not be flown in conditions that exceed the manufacturer's recommended limitations, including range, ceiling, and wind strength.

    b. High Risk Missions: The sUAS shall not be flown for any mission that the Mission Commander and the Pilot in Command determine that the risk of flying the sUAS outweighs the benefit to the mission. Risk may include hazards to individuals or property on the ground, possible collision hazard with other aircraft, loss of control of the sUAS. If a mission develops into a high risk mission, the mission shall be terminated by the Pilot in Command.

ii. Currency Training:

1. Pilots: All pilots must have 3 flight hours and 6 launch and recoveries in the proceeding 90 days in the specific sUAS model to be eligible for a law enforcement flight mission.

   Each pilot must undergo re-currency training every 12 months. Re-currency training shall include:

   a. Assembly and Disassembly
   b. Launching and Recovery
   c. Review of Relevant FAA Regulations
   d. Emergency Operations
   e. Low Altitude Operations
   f. Manual Operations
   g. Surveillance Patterns
   h. Weather

c. Observer:

i. Observer Required: An Observer is required for all missions.

ii. Observer Experience: All Observers must participate in the preflight briefing, which shall include but not be limited to a review of mission goals and methods to accomplish those goals, review of communication procedures, and a review of emergency procedures. The Observer will receive specific training on relevant Part 91 regulations, such as the obligation to see and avoid other aircraft and the ability to identify position for purposes of relaying position reports to other types of aircraft.

d. Operational Conditions:

i. Line of Sight: All sUAS operations shall be conducted within line of sight of the Pilot or Observer such that the Pilot or Observer may detect and avoid hazards such as aircraft and property.

ii. Weather: All flights will be conducted in VFR weather with the informant amounts consistent with Class E airspace minimums. Flight may not be conducted in known icing conditions.

1. Heat: The operational guidelines for heat are less than [redacted] degrees Fahrenheit. Operation in temperatures over this mark should be noted with the air density as noted from the most current conditions found at an airport facility. The battery and length of flight should be adjusted accordingly based upon high humidity and temperature with air density. These local conditions may warrant the Pilot in Command opting to not fly based up these flight conditions.

2. Cold: The operational guidelines for cold are greater than [redacted] degrees Fahrenheit. Operation in temperatures under this mark should be noted with the air density as noted from the most current conditions found at an airport facility. The battery and length of flight should be adjusted accordingly. Also, if the moisture level is high, conditions should be noted for icing on wings and flight surfaces. These

conditions may warrant the Pilot in Command opting to not fly based up these flight conditions.

3. Wind: The operational guidelines for wind are less than [redacted] MPH at the surface. Operation in wind conditions over this mark should be noted from the most current conditions found at an airport facility. The Pilot in Command may also utilize a hand held anemometer and decide that local conditions are too hazardous and opt to not fly based upon these conditions.

4. Rain, Snow and Fog: The operational guidelines for these conditions are based upon visibility and operator safety at the local site. The Pilot in Command and Observer must adhere to the line of sight and VFR.

iii. Night Flight: Night flight [redacted]

IV. FLIGHT REQUIREMENTS:

a. Mission Request: all requests for sUAS to provide support for a mission shall be forwarded to the Program Manager. The Program Manager shall discuss the proposed mission with the Mission Commander. Such discussion will consider the following:

i. The location of the mission for purposes of insuring the safety of people and property;

ii. The intended area of operation for purposes of evaluating the ability to mitigate potential air to air conflicts. Such evaluation will take in consideration the current landing patterns at airports in the vicinity. Whenever the approach path of an airplane to a nearby airport would involve flying over the intended area of operation, such operations shall be coordinated with the appropriate air-traffic control facility. All coordination will be done is accordance with any requirements in the Department's COA issued by the FAA.

iii. The weather and its potential effect on the aircraft, including the ability to carry the aircraft to potential area of high air to air conflict.

iv. The currency of the proposed pilot and Observer.

v. The potential usefulness of the information gathered by the sUAS versus information gathered through other means.

vi. Any other relevant risk factors to successfully complete a risk benefit analysis for the use of sUAS in the long portion mission.

b. Once the Program Manager has approved the mission request, the Mission Commander identifies the pilot and Observer and coordinates with individuals requesting the mission.

c. Preflight Preparation: Before any mission the Pilot in Command must conduct a preflight briefing (see attached form). The briefing shall include the following:

i. Identification of mission purpose.

ii. Identification of individuals participating in the mission regardless of whether they are aircraft or ground support.

iii. Identification of mission limitations, including weather limitations and flight time limitations.

iv. Identification of flight area, including maximum ceiling and floor.

v. Coordination of communication procedures between Pilot and Observer and aircraft and ground support.

vi. Emergency Operations including review of aircraft system failure and lost link.

d. Scene Review: The Pilot and Observer are responsible for identifying and securing all safety items at the scene. These include:

i. Take-off and landing site: This area needs to be free of obstructions, items on the ground and debris that may interfere with the rotors. This includes creation of a flight line, which other law enforcement officers and civilians must stand back from this area.

ii. Flight perimeter: The site must utilize Observers, law enforcement officers and standard protocols to minimize civilian traffic or interference during the operation.

iii. Safety View: The flight team should identify trees, bushes, power lines, and other potential obstructions and coordinate the preflight briefing accordingly.

iv. Interference: The flight team should identify Cell Towers, TV and Microwave sources, which might create interference with the flight equipment. The equipment should be tested on the ground to insure proper communications and operation before the flight.

e. ATC notification: The Pilot in Command shall notify the appropriate air-traffic control facilities in advance as early as possible. Such notification should include the following:

i. The intended location of the flight,

ii. The intended duration of the flight,

iii. The maximum altitude of the flight, and

iv. The cell phone of two individuals for emergency contact.

v. The pilot shall request a specific transponder code to be utilized during the flight.

vi. The pilot shall notify air-traffic control immediately at the conclusion of the flight.

f. Communications: The Pilot in Command and/or the Observer shall have a VHF radio capable of transmitting position reports to nearby aircraft. It shall be the responsibility of the Pilot in Command and/or the Observer to monitor local communication frequencies to assist in the de-conflicting the sUAS from other aircraft.

g. Flight operations: All flight operations shall be conducted in accordance with the manufacturer's manual. If any time the Pilot in Command and/or Observer believe there is a potential for air to air conflict, risk of harm to individuals or property, the Pilot shall immediately land the aircraft. In the event of loss communications with the aircraft, the aircraft shall fly to a predetermined

location and land. If the aircraft does not immediately execute these orders, the Pilot in Command or Observer shall immediately notify air-traffic control.

V. REPORTING:

a. The Mission Commander shall be responsible for logging all flights. The flight log should include the following:

   i. The name of the Pilot in Command,

   ii. The name of the Observer,

   iii. The area of operations,

   iv. The duration of the flight, and

   v. Any unusual circumstances (including loss of link or aircraft damage).

b. Reporting incidents or accidents: the Mission Commander shall also be responsible for reporting any incidents or accidents to the local Flight Standards District Office.

Appendix A – Flight Checklist (STICKS – Without Ground Station)

Flight Checklist

- Check all Battery Voltages for accurate flight voltages
  - Flight Control Batteries – 12.4 Volts or Higher
  - Main Batteries – 25.1 Volts or Higher
- Check all mechanical linkages, joints, and mechanical elements
- Check Main and Tail Blades by hand for any issues
- Turn JR Radio 'On'
- Connect only the Flight Control Batteries for the Autopilot
- Turn on the Power Switch for the Autopilot on the electrical panel
- Read and watch the LCD as it boots up and walks through checklist
  - Power – The system will insure power and proper voltage
  - Communication – The system will insure Wireless connectivity and signal strength
  - GPS – The system will look for Usable and Visible GPS satellites and show counter
  - Magnetometer – The system will look for proper connectivity of the Magnetometer
  - Laser Altimeter – The system will look for proper connectivity of the Laser Altimeter
- The system will give a Final – Solid BLUE LED that indicates FULLY STABLE and full GPS lock of greater than 5 satellites. The system will also indicate the number of Visible and Usable satellites and a PDOP rating
- (Safety Pilot) Swing tail of the Helicopter - Verify dual gyro gain operation with Autopilot when the tail rotors counteract the inertial movement
- (Safety Pilot) Connect Main Power Batteries via quick connects, and Pilot in Command moves away from the Helicopter.
- Insure that all personnel are behind the Flight line, and announce that the Vehicle is 'Hot'
- Check for aircraft traffic and make any radio calls mandated by air traffic control and communicate to Safety Team.
- Pilot in Command - TURN ROTORS ON
- Once the Rotors are at a stable RPM Helicopter Takeoff and start watch or timer.

Appendix A – Flight Checklist (GCS – With Ground Control Station)

Note: Software Windows and Menu Items in brackets ( )

Flight Checklist

- (Map>Right Click) Configure flight map with appropriate altitudes, LAT/LONG as required for the mission.
- Verify and/or load flight plans (Check Altitude on WGS or AGL to insure location limits)
- Click Engine 'KILL ENGINE' before approaching Heli to ensure the motors are off before approaching the vehicle
- Turn JR Radio 'On'
- Change 'Flight Mode' in tool bar to NONE
- Verify GPS 'Halo' and 'Helicopter' Icons are in relative map area expected (If not Check Window>Telemetry GPS)
- Right Click on 'Helicopter' Icon >'View Waypoints' and validate that all GPS coordinates are in the proper sequence and order
- (Window>Status>System) Verify Voltage of Helicopter Flight Control System Battery (~12 V)
- (Window>ground station) Verify GPS Count for the Ground Station, check number of satellites and PDOP. Request Radio settings to insure communications from the Helicopter
- (Same) Verify Ground station is on AC power (>14 V) or Battery has sufficient voltage for flight (11 > v)
- (Window>Status>Telemetry) Verify Helicopter is seeing same number of satellites and PDOP
- (Window>Status>Telemetry) Lift the Helicopter and watch the altitude section to see the Laser Altimeter is operating properly
- (Window>Preflight>Mission Limits) Identify the
    - Maximum Height and Minimum Height are set below 300 Ft, and above the terrain minimum
    - Identify Flight Termination logic for Rotor cutoff of Loss of GPS and Communications
    - Set the GPS point for Lost Communications Automatic Landing (Lat/Long) and initial and final landing logic
- (Window>Preflight>Command Loop) Check and Verify Command Loop Settings (typically all auto). Identify the forward speed (2 M/S) and also the first GPS waypoint
- (Window>Preflight Checklist with Observer) Pick up the helicopter and check pitch, rolling, collective and yawing by verifying the artificial horizon on the Ground Station reacts accordingly.
- (Physical Test) Tilt forward, backward, lift up for artificial horizon responds
- (Safety Pilot) Swing tail of the Helicopter - Verify dual gyro gain operation with autopilot when the tail rotors counteract the inertial movement
- (Safety Pilot) Connect Main Power Batteries via quick connects, and pilot moves away from the Helicopter.
- Insure that all personnel are behind the Flight line, and announce that the Vehicle is ‘Hot’
- Click Engine 'On' in the Ground Station
- Check for aircraft traffic and make any radio calls mandated by air traffic control.
- Click 'LAUNCH NOW', Heli goes to spool up and take off
- (Safety Pilot) TURN ROTORS ON after heli is spooling
- Helicopter Takeoff and start watch or timer.