722	**MANSFIELD POLICE DEPARTMENT**
	SMALL UNMANNED AIRCRAFT SYSTEM (SUAS)
	Effective Date: 10-06-2016
	Approved: Tracy Aaron Chief of Police

722.01 PURPOSE

The purpose of the small unmanned aircraft program of the Mansfield Police Department is to provide an added resource to the agency that enhances the safety of the public as well as its members. This technology not only allows for a safer, more effective and thorough search and rescue mechanism it can also provide officers with the ability to analyze potential threats on active scenes and prevent unnecessary injuries. It has the ability to deliver lifesaving payload to individuals otherwise inaccessible to emergency service providers.

722.02 LIMITATIONS

The program will respect the privacy considerations of citizens, and the use of air patrols will be very limited in scope and only used as authorized by the Chief of Police. The *random* use of the system in residential areas, solely for the purpose of gathering evidence related to criminal wrongdoing or for any other unauthorized purpose, is prohibited.

722.03 DEFINITIONS

A. SUAS – A SUAS is a Small Unmanned Aircraft System, commonly referred to as a "drone".

B. National Airspace System - (NAS). The air space is owned and regulated by the Federal Government specifically the FAA. From the ground upward (No defined height limit) is within the jurisdiction of the FAA.

C. ATC – Air Traffic Control

D. COA - Certificate of Authority, document issued by the FAA that allows a "public entity" to conduct flight operations of a SUAS within a specific area and altitude clearance.

E. Airworthiness - In accordance with current rules and regulation the airworthiness of the SUAS will be certified by the Chief of Police.

F. Registration - SUAS Registration Marking with N Number in accordance with 14 CFR Part 45. AC Form 8050-1 and evidence of ownership to Aircraft Registration Branch AFS-750 $5.00 (See Attached documentation)

G. Markings – The SUAS shall be marked with the "N" number as required by federal law and further shall be identified as belonging to the Mansfield Police Department by prominently displaying "POLICE" in black or blue on the aircraft. Equipment *may include* the use of red and blue lights to further identify the aircraft as belonging to law enforcement, but is not required for operation.

H. PIC – Pilot in Charge – This individual has total control and authority over the flight operations of the SUAS and is civilly and criminally responsible to State and Federal Agencies tasked with safe and legal operation of a SUAS in the NAS. The PIC must continuously scan the NAS for possible Aircraft incursions or other dangers that require immediate action. Those not certified as an SUAS operator may only operate the SUAS under the direct supervision of a certified operator.

I. Visual Observer – Is responsible to assist in monitoring the NAS prior to and during Flight Operations. The VO will prior to flight operations survey the area of operations for any hazards to flight operations (power lines, power poles, towers, radar dome reflectors, buildings, etc...). During flight operations the VO can be responsible for operation of the camera system affixed to the SUAS, but must also continuously scan the NAS for possible Aircraft incursions and alert the PIC to any situations that require immediate action.

J. Exigent Circumstance Flights – These are SUAS flights that are performed in emergency circumstances where the loss of life and property is imminent or has already occurred. The use of the SUAS can be requested by any governmental or statutory agency that is designated to deal with emergencies (Search/Rescue, Tornado, Flooding, Large fires, etc.) Response to such requests will be approved by a sworn department supervisor prior to the deployment of the PIC.

K. Search Warrant Required Flights – Any flight not designated a training flight, exigent circumstance flight, or a plain view surveillance activity *shall require issuance of a search warrant prior to any aircraft activities.*

L. Surveillance Activities - Any *intentional* surveillance flights that fall outside of the search warrant requirement such as "plain view" (or observation from a location that where suspected activity can be legally viewed) are permitted only with authorization by a sworn Division Captain or above. Only after authorization is received may surveillance activities begin.

722.04 MAXIMUM FLIGHT LEVEL

A. The maximum altitude for flight of the SUAS is 400' AGL.

B. Flight may exceed this altitude with higher clearance from the appropriate ATC

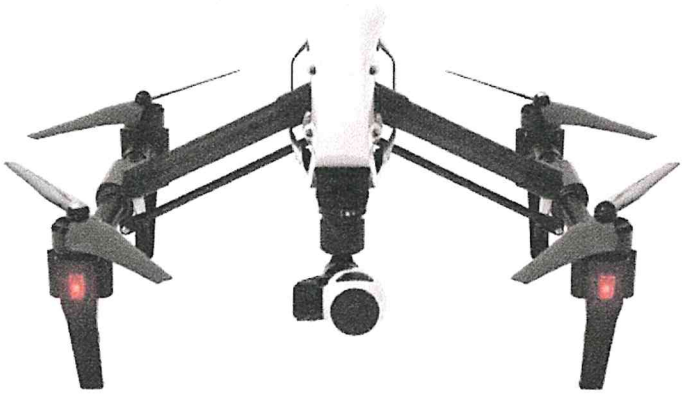
722.05 CRITICAL INCIDENT CHAIN OF COMMAND

A. The normal Chain of Command will be followed at all times during the operation of the SUAS by Mansfield PD certified PICs. Supervisors will become familiar with the operational limitations of SUAS devices to ensure that they are not requested for deployment in prohibited situations.

B. PIC/VO – Flight Operations Team may start/suspend/terminate Flight Operations at any time based upon current FAA rules and regulations, safety of personal and operations area civilian overflight. NOTAMS (Notice to Airman), SIGMETS (Significant Meteorological Information), AIRMETS (Airman's Meteorological Information) and TFR (Temporary Flight Restrictions) may all be factors in determining flight decisions.

722.06 DESCRIPTION OF SYSTEM

A. The Inspire 1 is a Small Unmanned Aircraft System (SUAS) and is a rugged and reliable system that provided immediate, real-time airborne situational awareness for a variety of missions. The system is comprised of a Vertical Takeoff and Landing (VTOL) air vehicle, payload and associated Controlling devices.



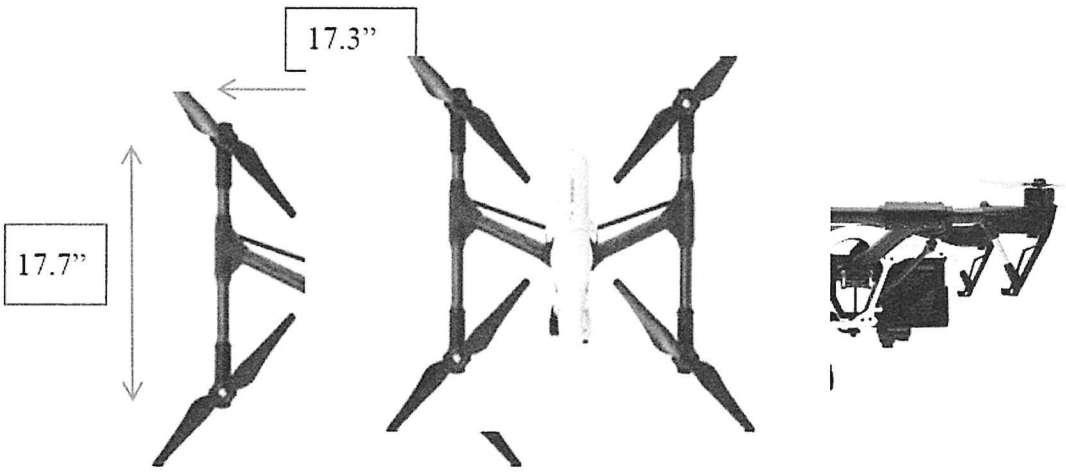
B. The Inspire 1 features an intuitive user interface on a touchscreen-tablet. The SUAS autopilot enables position-hold (using GPS) and altitude-hold (using barometric sensors) throughout the flight. There are no "Waypoints" defined by the Pilot in Charge (PIC) in the operation of the system: instead the system uses the location where the SUAS was launched from as "Home" location and as the Loss-of-Link landing location (See loss of Link section).

C. The Inspire 1 also features DJI Go which software which provides altitude limits as additional safety features. Also prohibits flight of the SUAS beyond a user-defined radius, centered at the launch location "Home". Altitude limit prohibits flight of the air vehicle above a user-defined maximum altitude.

D. The Inspire 1 can be launched and recovered in minutes without special equipment on unprepared terrain. The SUAS is battery-powered and has low visual, acoustic, and thermal signatures. The SUAS flies up to 24 minutes on a rechargeable Lithium-Ion battery pack. The standard payload is a 3-Axis, 360* rotating gimbal that includes a 4K, 12 Megapixels camera. The SUAS is typically operated by a two-person team consisting of the PIC and Visual Observer.

E. Communications are maintained between the aircraft and the ground by the use of "Lightbridge Technology" for the Video and Wireless Technology utilizing 5.725 ~ 5.825 GHz - 2.400 ~ 2.483 GHz band width to transmit and receive fight data to the Controller.

F. The Inspire 1 disassembles into simple subcomponents for storage and transportation. The complete air vehicle is contained in a single hard shell carrying case. And a foam liner supports and protects the components from damage.



722.07 SPECIFICATIONS

Payload	-High resolution color camera
Range	-2 km line-of-sight
Endurance	-24 minutes on single battery pack
Operating Altitude (Typical)	-0-500 feet AGL
Dimensions	-17.3" x 11.8" x 17.7"
Control Station	-DJI Controller with touchscreen tablet with Digital Data Link Module

722.08 PERFORMANCE CHARACTERISTICS

Climb Rate:	-984 ft/min
Descent Rate:	-787 ft/min
Maximum Cruise Speed:	-42 knots
Minimum Cruise Speed:	-0 knots
Operating Altitude Maximum -	14,763 ft MSL
Operating Altitude Minimum -	0 ft. AGL
Gross Takeoff Weight: -	6.47 lbs.

722.09 TRANSPORTATION AND STORAGE

The SUAS has a two self-contained transport cases. One is a solid plastic case, with a locking lid. The interior is compartmentalized to specifically fit the SUAS and its associated equipment to include 2 Controllers. The second transport case is smaller and is a zippered locking plastic case that has a compartmentalized interior specific to fit the SUAS, associated equipment and 1 Controller. ***The SUAS will not be transported assembled and flight-ready unless secured in a manner that prevents tampering or unauthorized flight***.

722.10 COMMUNICATION SYSTEMS DESCRIPTION

A. The system does not provide voice or ATC Communication. If ATC or other communication is required, operators must use a separate device such as a hand held radio. Typically the Visual Operator is co-located with the Inspire 1 PIC (within speaking distance) and there is no need for communication equipment between PIC and the Visual Observer. The PIC must provide appropriate equipment when remotely located Visual observers are used for situational awareness and see-and-avoid duties.

B. The aircraft utilizes Controller specifically manufactured for DJI and the Inspire 1 along with the Lightbridge wireless built in. the Controller operates on the frequencies of:

5.725 ~ 5.825 GHz
2.400 ~ 2.483 GHz

- Transmitting Distance (outdoor and unobstructed: 2 km

EIRP
10dBm@900M
13dBm@5.8G
20dBm@2.4G

- Output Power:9W
- Battery: 6000 mAh LiPo 2S
- Max Mobile Device Width:170mm

722.11 LAUNCH / RECOVERY

A. The Inspire 1 design allows for Vertical Takeoff and Landing (VTOL). Launch and recovery are performed similar to traditional helicopter/VTOL operations. The Inspire 1 requires a relatively flat surface free of larger obstructions to be used as it launch/recovery location. The Inspire 1 requires no launch/recovery support equipment.

B. The SUAS provides a gimbaled camera that is positioned underneath the airframe and allows it to look straight down bellowed the aircraft during launch and recovery allowing the Visual Operator to view the launch and recovery locations.

C. The system implements a number of safety features for launch and recovery. The SUAS has a built in "auto launch" and "RTH" return to home. Both functions can be initiated by either the PIC or the Visual Observer. Pre-flight and post-flight checklists enable to PIC/Visual Operator to identify any issues prior to flight.

722.12 PRE-FLIGHT / POST-FLIGHT CHECKLIST

A. Each time the SUAS is flown a pre-flight and post-flight checklist will be completed. (See Attached Exhibit A). These checklists will be maintained by the PIC for reference purposes.

B. SUAS Flight profile and information is also recorded on this form.

722.13 SYSTEM EMERGENCY PROCEDURES

A. Normal mission planning procedures include consideration of emergencies for each phase of the flight. They system provides continuous air vehicle status and presents warnings and indications of various emergency conditions. During flight, PICs maintain situational awareness and monitor data to notice anomalies as soon as they develop. Emergency procedures include information to handle each of the following:

1. Loss Of Link
2. GPS Failure
3. Structural of Flight Control Failure
4. Extreme Low Air Vehicle Battery
5. Propulsion Failure
6. Tablet Controller Failure
7. Altitude Hold Failure
8. Avoiding Collision with Other Approaching Aircraft.

B. Emergency Procedures

1. **Loss Link/GPS Failure/Low Battery/Altitude Hold Failure** - Upon loss of the link the aircraft will begin a predetermined Loss of Link (LOL) action. The LOL landing location is always the same as the launch (RTH) location of aircraft. The only modification that can be made to this flight path is vertical movement. The PIC utilizing the controller to control height of aircraft. And the second option is to override the RTH upon regaining signal and land the aircraft immediately.

   a. Upon entering LOL the aircraft will immediately climb to the "Safe" altitude pre-programed. And will proceed directly to the Launch (RTH) location. Upon reaching the location the aircraft will go into a hover and the PIC can at that time initiate and automatic touchdown/landing of the aircraft.

   b. Structural Flight Control Failure/Propulsion Failure – In the event of the failure, the aircraft will immediately terminate flight operations and safely land as quickly as possible.

722.14 AVOIDANCE OF OTHER AIRCRAFT

It is the responsibility of the PIC at all times to be aware of the "National Air Space" and the possibility of the intrusion of the SUAS in the Flight Path or Operational Area of any Aircraft.

722.15 MEDICAL EMERGENCIES

In the event of a medical emergency with any personnel involved, flight operations will cease and emergency responders will be contacted. The emergency medical facility closest to the city of Mansfield operation area is:

Mansfield Methodist Hospital
2700 East Broad St.
Mansfield TX 76063
682-622-2000

722.16 REPORTING

Incident reports will be logged and applicable authorities notified. Any incidents pertaining to the performance of the aircraft or other parts of the system will be reported to the manufacturer.

722.17 ATC NOTIFICATION

A. In an emergent situation, should it become necessary to contact one or more of the ATC facilities, VHF radio communication via the appropriate frequency shall be the preferred method. In lieu of radio communication, traditional or cellular phone contact will be made.

B. Local ATC possibly affected: Cleburne Municipal Airport (KCPT), Ft. Worth Spinks Airport (KFWS), DFW International Airport (KDFW) (Class B Airspace)

EFFECTIVE:

Tracy Aaron
Chief of Police

EXHIBIT A
INSPIRE 1 / SR# / FAA REGISTRATION # N

Date of flight:_____

Pilot in charge:_____

Observer: _____

Time of flight: _____

Reason for flight:_____

Location of flight:_____

GPS Coordinates:_____

Weather Conditions:

_____

_____

Pre-flight checklist / Performed by: _____

Notify ATC if applicable:

_____

_____

Inspect Aircraft: Body _____ Props _____ Wiring/ Connections _____
Landing equipment: _____ Lights: _____ GPS:_____
Battery Condition: _____

Comments:

_____

Post-flight checklist / Performed by: _____

Notify ATC if applicable:

_____

Inspect Aircraft: Body _____ Props _____ Wiring/ Connections _____
Landing equipment: _____ Lights: _____ GPS:_____
Battery Condition: _____

Comments: _____

Accidents / Incidents / if so explain: _____
Reported to the FAA as Required: _____ By Who: _____

Description of incident to FAA: (See Attached)

Agencies assisting or represented at incident: _____