Chapter 2

Mutual Aid Box Alarm Systems
Unmanned Aircraft Systems Program (UAS)

Equipment Selection, Purchase, and Maintenance

OVERVIEW

This document contains the recommended UAS and support equipment as well as maintenance guidelines for a MABAS UAS Program. Having a standard set of equipment is critical for successful operations during multi-day incidents by insuring interoperability between agencies and divisions. This guidance will focus on rotor-wing aircraft.

UAS EQUIPMENT GUIDANCE

This guidance is specific to any type of team that will perform public safety functions at an event or incident. The goal of this guidance is to standardize the equipment used to make mutual aid requests more efficient through component interoperability. This guidance is based on technical capabilities and interoperability of the specified equipment.

A. General mission aircraft

General mission aircraft are meant to meet the needs of most missions. These missions typically involve collecting, visualizing and processing data. These aircraft will typically be owned and operated by local agencies, divisions and at the state level. The types of missions they are ideal for are:

- Overwatch
- Mapping / Pre-planning
- Search / Recon

Key features of this aircraft will include:

- Redundant batteries
- Multiple sensor configurations
  - Dual sensors
  - Thermal, visual, zoom, etc.
- Collision avoidance
- Warm and cold weather operations
- Wet weather operations

See Attachment B Equipment and Maintenance, for recommended configuration and support equipment information. In the Unmanned Aircraft Systems Program (UAS) Policy.

B. Lightweight / indoor / training aircraft

Lightweight / indoor / training aircraft are meant to be used for training purposes and for providing initial data during an incident. Their small size allows for easy storage and transportation. They can be used in limited indoor scenarios, but not confined spaces. Their fixed sensors are not ideal for night flights unless the scene is very well lit. These aircrafts will be typically owned and maintained at local, divisional and state agencies. They are ideal for the following missions:

- Overwatch
- Mapping / Pre-planning
- Search / Recon

See Attachment B Equipment and Maintenance, for recommended configuration and support equipment information. In the *Unmanned Aircraft Systems Program (UAS) Policy.*

C. Heavy lift aircraft

Heavy light aircraft are intended for delivering payloads to a victim, suspect or public safety personnel. In general, they should be able to lift a minimum of ten pounds (10lbs.) and have a dedicated payload release system. Typically, these aircraft will be owned and maintained at the divisional and state level and be at least available regionally to other agencies. These aircraft are suited for any incident type requiring payload deliveries such as water rescue, USAR, etc. Key features of these aircraft include:

- Lift more than ten pounds (10lbs.)
- Dedicated payload release system

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UAS PURCHASING

Selecting a vendor is a critical component to an UAS program. It is recommended that requirements beyond the core equipment specifications include:

1. Continuous operations

   It is important to ensure that the aircraft and support equipment (controller, tablet, anti-collision lights, etc.) can support continuous operations. Below are recommended continuous operational time frames that should be anticipated for UAS teams:

   - Local Agency Teams – four (4) hours
   - Divisional Teams – twelve (12) hours
   - State Teams – twenty-four (24) hours

2. Support
   - Cases, landing pads, etc.
3. Equipment delivery

   With any new piece of equipment, it is recommended that a vendor perform an onsite installation of equipment to ensure the proper use of the equipment.
4. Technical service plan / support for equipment
   - Distribution of manufacturer communications.
   - Routine service inspections and component replacements.
5. Replacement plan in the event of equipment failure (not such a warranty).

UAS MAINTENANCE

Maintenance is a must to sustain a healthy UAS program. It should include routine as well as post incident and event maintenance. All components of the aircraft including the batteries and support should be part of an UAS maintenance program.

A. Manufacturer routine maintenance

1. Should be performed based on manufacturer recommendations.
2. A checklist should be developed based on manufacturer maintenance steps.
   - Name of maintenance person
   - Date
   - Any deficiencies
   - Readiness status

B. Weekly maintenance

1. UAS physical inspection for damage or defects including props, and payloads.
2. Battery inspections and readiness.
    - Charge is necessary
3. Firmware checks.
4. Inspect support equipment.
5. Wipe down / clean if necessary.
6. A checklist should be developed based on manufacturer maintenance steps.
7. Name of maintenance person.
    - Name of maintenance person
    - Date
    - Any deficiencies
    - Readiness status

C. Post event / incident maintenance

1. Check for physical damage to UAS, payloads and props.
2. If used in HazMat, must be appropriately decontaminated according to the manufacturer prescribed limitations of the aircraft before returning to service. If decontamination can not be performed and verified, the UAS should be removed from service indefinitely.
    - If flown in corrosive environment, consider permanently taking aircraft out of service.
3. Charge batteries as necessary.

D. Battery charging cycles

1. Batteries should always follow manufacture recommended maintenance practices.
2. See Attachment B Equipment and Maintenance for guidance on keeping batteries in a mission ready state of charge. In the *Unmanned Aircraft Systems Program (UAS) Policy*.