

# Heterogeneous Multi-Robot Sampling

## Standards & Regulations



Team G: SAMP



PART 107  
Small Unmanned Aircraft Systems



# PART 107 - What it is about

- Proposed operating and certification requirements to allow small unmanned aircraft systems (small UAS) to operate for non-hobby and non-recreational purposes.
  - Crop monitoring/inspection;
  - Research Development;
  - Education/Academic uses;
  - Antenna inspection ...
- Incorporate the operation of small UAS into the National Airspace System (NAS)
- Let UAS operation pose least amount of public risk and no threat to national security

# PART 107 - What it is about

- Small UAS registration
- Airman (Remote Pilot) certification
- Operation rules of civil small UAS
  - Operation of multiple small unmanned aircraft.
  - Operation near aircraft; right-of-way rules.
  - Operation over human beings.
  - Operation in certain airspace.
  - Operation in the vicinity of airports.
  - Operation in prohibited or restricted areas.
- Waivers
- Proposed and passed by FAA

# PART 107 - Products/Markets

PIONEERING  
RESEARCH  
WITH UAS  
TECHNOLOGY

*The applications are boundless*



# PART 107 - Products/Markets



# PART 107 - Products/Markets

**UASD**

Unmanned Aerial Systems Development, Inc.

**Skylogic Research**  
Drone Analyst<sup>®</sup>

 **DRI**  
Desert Research Institute

 **PRECISIONHAWK**

**AR**  
AMERICAN ROBOTICS

**amazon**  


# PART 107 - Prescriptions

- Operational Limitations
  - Aircraft weight, size, speed
  - Operation field
- Remote Pilot in Command Certifications and Responsibilities
  - Pilot certification
  - Safety check procedure
- Aircraft Requirements
  - FAA airworthiness certification not required
  - Preflight check required



# PART 107 - Application to SAMP

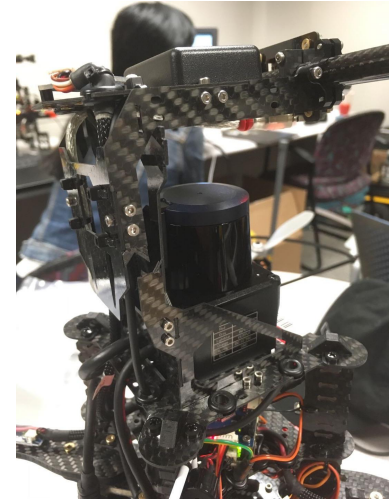
	PART 107	AscTec Pelican
Weight	$\leq 25$ kg	1.65 kg
Speed	$\leq 100$ mph	36 mph
Maximum Altitude	400 feet	3280 feet



# PART 107 - Application to SAMP

We had a crash last semester:

- Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation.





ECMA 109

Declared Noise Emission Values of  
Information Technology and  
Telecommunications Equipment



# ECMA 109 - What it is about

- The purpose:

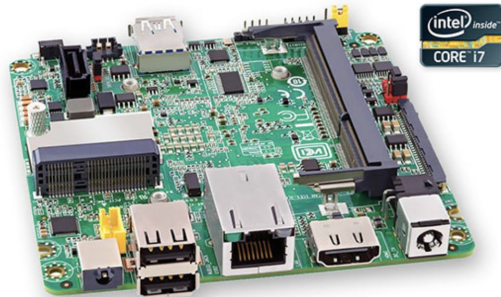
To provide uniform methods of presenting declared noise emission values to users.

# ECMA 109 - What it is about

- For a batch of equipment, the method for determining the following values:
  - the declared mean A-weighted sound power level
  - the declared mean A-weighted emission sound pressure level
  - the statistical adder for verification
  - the statistical upper limit A-weighted sound power level
- How acoustical and product information is to be published electronically or in hard-copy format in technical documents or other product literature supplied to users by the manufacturer or declarer
- The method for verifying the noise emission values that are declared by the manufacturers or declarer.

# ECMA 109 - Products/Markets

- This ECMA Standard applies to information technology and telecommunications equipment.



# ECMA 109 - Products/Markets



IT Infrastructure Servers ▾ Storage ▾ Software ▾ Solutions ▾

## Team up with the recognized leader in acoustical services

IBM Product Testing and Engineering Services (PTEDS) provides the best in acoustical measurement technology, noise control engineering and the application of acoustical standards.

- **Noise emission measurements - sound pressure and sound power**

ANSI S12.31 - ISO 3741

ANSI S12.32 - ISO 3742

ANSI S12.34 - ISO 3744

ANSI S12.35 - ISO 3745

ANSI S12.10 - ISO 7779

ECMA 74

- **Sound power of air-moving devices**

ANSI S12.11 - ISO 10302

- **Calibration of reference sound sources**

ANSI S12.5 - ISO 6926

- **Sound absorption**

ASTM C423 - ISO 354

- **Noise reduction of sound-isolating enclosures**

ASTM E596

- **Compliance determination/preparation of noise declarations**

ISO 9296

ECMA 109

# ECMA 109 - Prescriptions

- Conformity requirements
- Determination of the declared mean A-weighted sound power level
- Presentation of declared noise emission values
- Verification of the statistical upper limit A-weighted sound power level



# ECMA 109 - Prescriptions

- Conformity requirements
  - Declaration:
    - Measurement: ECMA 74
    - Determination, Presentation: ECMA 109
  - Verification:
    - Measurement: ECMA 74
    - Verification: ECMA 109
      - statistical upper limit A-weighted sound power level,

# ECMA 109 - Prescriptions

- Determination of the noise emission values to declare
  - The determination of the declared noise emission values is the sole responsibility of the manufacturer of the equipment.
    - For customers who want to know basic emission level:
      - A-weighted sound power level
      - A-weighted emission sound pressure level
    - For customers considering purchase larger quantities of equipment:
      - Statistical upper limit A-weighted sound power level

# ECMA 109 - Prescriptions

- Presentation of declared noise emission values
  - The presentation of the declared noise emission values
  - Information that need to be included:
    - “Declared noise emission values in accordance with ECMA-109” followed by the declared value
    - If one or more mode is possible, additional information to determine unambiguously the mode(s) used for declaration
- Verification of the statistical upper limit A-weighted sound power level
  - Only Applicable to:
    - statistical upper limit A-weighted sound power level

# ECMA 109 - Application to SAMP

If selling the product or services:

- Declaration of the IT equipment noise
  - On-board computers
  - Master computer
  - Electronic units
  - Router

# Q&A

