

UNIVERSITY OF NOTRE DAME



UAVND SAFETY HANDBOOK

2020

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1 Introduction

The purpose of this document is to identify all the rules and regulations every member of the UAVND club shall follow to establish a safe environment. It offers a standard baseline of knowledge for members to fulfill their role in the club fully and safely. It is important to review and adhere to these policies to actively participate in the club. Any questions that are not answered in this document should be directed to the Safety Officer.

2 Flying Requirements

2.1 University

In accordance with the University of Notre Dame's requirements, no aerial vehicle shall be flown on university land. Any violation of this policy will not be tolerated and club membership will be revoked. Test flights will only occur at the local AMA field.

2.2 Licencing

2.2.1 Remote Pilot Certificate

Any member of the UAVND club interested in flying an aerial vehicle must obtain a Remote Pilot Certificate from the FAA or be under supervision of someone who holds such certificate.



2.2.1.1 FAA Part 107

The FAA Part 107 are the rules and regulations that have been established by the FAA for small unmanned aircraft (UAS). The following rules outlined by Part 107 must be followed by all members involved with the flying of the aerial vehicles. The following information outlines the regulations that Part 107 consists of the following.

Operating Requirements

All drone operators should always avoid manned aircraft and never fly in a reckless manner. The drone must always be kept in sight. If using a headset for first person viewing, there must be a secondary observer keeping the drone in sight.

Flying may only be conducted during the day or twilight (i.e. 30 minutes before official sunrise to 30 minutes after official sunset). Proper anti-collision lighting must be used. The minimum weather visibility is three miles from the control station.

The maximum flying altitude is 400 feet above ground with a maximum speed of 100 mph. Flying over any individual, who is not involved in the flight, under any covered structure, or vehicle is prohibited.



An external load carried by the aircraft is allowed only if it is securely attached and does not greatly affect the flight controllability.

Registration

Every drone must be registered to fly under Part 107. If the drone weighs under 55 pounds, an automated registration system may be used.

2.2.2 AMA Membership

The UAVND club will conduct all test flights at the local AMA field. In order to fly there, an AMA membership is required for only the pilot. Including access to the field, the AMA membership includes \$2,500,000 of personal liability insurance coverage, \$25,000 medical coverage, and \$1,000 fire, theft, and vandalism coverage. Possession of an AMA membership grants access to every AMA field in the country. To document the club's activity, UAVND will contact in advance the AMA field selected for testing. That being said, club members must adhere to any rules set forth by the local field. Every AMA member must follow the AMA Safety Code in addition to local rules and regulations:

<https://www.modelaircraft.org/sites/default/files/documents/100.pdf>

To maintain transparency with the university, UAVND will establish known relationships with each AMA field where flying will occur. A College of Engineering administrator will review and authorize UAVND's ability to fly at any flight location being requested. This process will include obtaining official



approval from the field operators in the form of a letter or email. Verbal approval is insufficient. If storing equipment at a field, UAVND will coordinate a written contract with the field.

2.2.3 Safety Officer

The safety officer's role is to uphold all the requirements and regulations the UAVND club abides by. This includes all university policies, AMA regulations, and FAA regulations. The safety officer's essential duty of overseeing the safety of the club and its members requires the safety officer to obtain all licenses and permits regardless of his/her role in the flying of aircraft. These licenses include the AMA membership and FAA Remote Pilot Certificate.

3 Flying Safety

1. Have completed flight training as specified by the club, obtained a Remote Pilot Certificate, and signed up for AMA membership. If one has completed flight training and possesses AMA membership, but lacks a Remote Pilot Certification, flying is *only* permitted under the direct supervision of someone in possession of the certificate.
2. Have sent flight request and has received approval from UAVND before flying
3. Shall be identifiable as a UAVND club member
4. Shall keep aircraft within line of sight at all times
5. Shall keep vehicle below 400 feet above ground level



6. Shall not recklessly fly the drone
7. Shall abide by all AMA field regulations
8. Shall stay clear of aircraft while still being powered
9. Shall not fly aircraft directly over people
10. Shall not fly directly over buildings, utilities, vehicles, or poles
11. Shall be able to regain manual control of aircraft at all times
12. All test flights shall be preceded by extensive trials in a flight simulator (Gazebo or Real Flight)
13. Shall always reference the B4UFLY mobile app to decide if air space allows for flying

4 Materials and Procedures

4.1 LiPo Batteries

LiPo (lithium polymer) and Li-ion (lithium ion) batteries are popularly used in RC aircrafts. Proper care is important when dealing with these batteries. The following rules are required when dealing with LiPo batteries:



1. Always pick up a LiPo battery by its body, not its leads
2. Always charge LiPo batteries in a fire-proof location. Either use a LiPo-safe bag or box
3. Never charge a LiPo battery immediately after use. Wait for it to cool
4. Charge the LiPo battery at 1C or less
5. Never leave a charging LiPo battery unattended. If the battery begins to swell and get warm, stop the charge
6. Never use a damaged LiPo battery
7. Make sure the cell number and battery type are set correctly on the charger
8. Do not overcharge the LiPo battery
9. Do not leave the LiPo battery in hot environments (e.g. in the sun)
10. Always apply a balanced charge to the LiPo batteries to ensure even voltages across all cells and prevent overcharging



4.2 Soldering Safety

1. Always wear eye protection
2. Never touch the tip of the iron
3. Never set down the soldering iron on anything but the soldering stand
4. Hold wires or circuit boards together with clamps
5. Turn off soldering iron when not in use
6. Never keep head over what is soldered
7. Always use a fume extractor if available
8. Never work on a flammable surface
9. Always wear pants if soldering, and if not, cover legs



5 Disclaimer

As previously mentioned in section 2.1, the club does not condone flying on campus in accordance with the university policies. However, UAVND is not responsible for any misconduct and unknown flying on campus by any member of the club. To uphold this standard, every member of the UAVND club will be required to sign a liability agreement in order to fully participate in club activities. Furthermore, a written assessment similar to that used in UAV classes at the university will be required for participation in the club along with a flight test for those wanting to be involved with flying.

