FTCA Safety Guidelines

These guidelines provide FTCA members easy-to-follow rules ensuring safety is at the top priority while allowing individuals to enjoy the full recreational, educational, and scientific benefits of model aviation.

SAFETY GUIDELINES

1. **All safety guidelines must be followed while participating or identifying as an FTCA member.**
    a. Members are required to follow all Federal, State and local laws.
2. **All flying of members must be for recreational or educational purposes.**
3. **The presence of a knowledgeable pilot/trainer for Novice Pilots (recreational pilots with less than 5 hours flight time) is highly recommended.**
    a. Education of the standard practices and guidelines are best communicated via a personal presence of an instructor.
4. **Operation of recreational model aircraft (sUAS) must be done in compliance with 14 CFR Part 48.**
    a. Any recreational operator of a model aircraft between .55 pounds (250 grams) and 55 pounds (25 kilograms) must be registered with the FAA per the FAA sUAS Registration, and the registration number must be present on the outside of your aircraft. Register at https://faadronezone.faa.gov/.
    b. Take TRUST (Pilot Institute TRUST Online or The Recreational UAS Safety Test (TRUST) | Federal Aviation Administration (faa.gov).
5. **Never fly your model aircraft in a dangerous, careless, or reckless manner.**
    a. Pilots and crew must not fly under the influence of alcohol or drugs.
    b. It is recommended that pilots utilize the IMSAFE checklist provided by the FAA
        i. **I**llness—Is the recreational flyer suffering from any illness or symptoms that might affect the operation of the UAS?
        ii. **M**edication—Is the recreational flyer taking any drugs (prescription or otherwise) that might affect the operation of the UAS?
        iii. **S**tress—Is the recreational flyer experiencing any psychological or emotional factors which might affect his or her performance?
        iv. **A**lcohol—Has the recreational flyer been drinking within the last 8 hours? Depending on the amount of alcohol consumed, full metabolization can take up to 24 hours. Flyers should be aware that as little as one ounce of liquor, one bottle of beer, or four ounces of wine can impair flying skills.
        v. **F**atigue—Has the recreational flyer received sufficient sleep and adequate rest in the recent past?
        vi. **E**motion—Is the recreational flyer emotionally upset?
6. **Perform a thorough pre-flight of your aircraft (home-built or manufactured) before each flight, making sure it is in good operating condition.**
    a. Pre-flight practices should take into consideration the standard operations of the flying site and class of airspace as described below in guidelines #8 & #9.
    b. Inspection of the following areas:
        i. Control surfaces are free of defect or deformity, and work properly.
        ii. Hardware/fasteners are properly installed and working properly.
        iii. Electronic components (to include FPV gear if applicable) are in proper working order.
        iv. Fuel supply, whether battery or gas, in proper condition, not damaged, and not leaking.
        v. Propeller or rotors free of any defects or deformities and are properly installed.
        vi. Transmitter has been ranged checked and is working properly.
    c. Assess the planned location and environmental surroundings for potential safety hazards.
        i. Weather, time of day, and presence of onlookers should be evaluated as part of pre-flight operation.
    d. The FAA also recommends the following guidance to ensure members are taking proper care of their UAS between flights:

i. Maintenance of the UAS and its components should be conducted in accordance with the manufacturer's instructions.

ii. Recreational flyers should routinely check for software updates and, if available, consider updating to the latest manufacturer upgrades prior to flight.

iii. Flight-critical systems (e.g., rotors, battery, controls) should be checked for damage prior to flight and repaired or replaced if any damage is found.

iv. Control links should be tested prior to flight and no flight should be attempted if command and control signal strength is anticipated to be inadequate for completion of the flight.

v. Servos, rotors, and other moving parts should move freely or respond to controls as expected.

vi. All systems should have adequate energy supply to complete the planned flight safely.

vii. Guidance systems and instruments (e.g., Global Positioning System (GPS), compass, altimeter) should be accurate and performing as expected.

viii. Automated features (e.g., return to home, auto-land) should function correctly and as expected.

ix. All external loads (e.g., cameras, guidance system) should be attached securely to the UA without negatively affecting the weight and balance of the aircraft.

x. The expected flight path should be free of other people, aircraft, and obstacles.

7. **Never interfere with, and always give way to, any manned aircraft.**
   a. The UA pilot should understand and be aware of manned aircraft operations in the area.
      i. The recreational pilot must understand that we share the National Airspace System (NAS) with man-carrying aircraft and other FAA-managed aeronautical operations. It is imperative that we yield the right of way and maintain a separation between our operations and theirs.
      ii. Recreational pilots are responsible for staying away from manned aircraft, not the other way around!
   b. Know the normal operations of frequent aircraft in the flying area.
8. **Pilots must operate within the proper flying site standards approved by the FTCA.**
   a. Every flying site and aircraft will be different and will require the effort of the pilot to understand the limitations and restrictions that may apply to the area they are going to fly.
      i. The FTCA has adopted the AMA document on flying sites, "Suggested RC Flying Site Specifications", as a standards guide for helping establish FTCA flying fields.
   b. FTCA approved Flying Fields meet or exceed the requirements for the aircraft allowed to operate on the site. (Due to the size of aircraft, and the availability of airspace, the size will be determined on a case-by-case basis. Guidance from the FTCA will be given to establish and maintain regulatory compliance for the location, as indicated above.)
      i. FTCA Flying Fields will also be aligned with the requirements set forth to be a future FAA Recognized Identification Area (FRIA) in order to be in compliance with Remote ID regulations as they come into effect.
9. **Pilots must determine a proper flying location if not flying at an approved FTCA flying site.**
   a. Recreational pilots must know where they are flying with respect to authorized airspace.
   b. Non-approved FTCA flying location parameters for safe operation will depend on the aircraft that is being flown and should take the following into consideration, along with the "Suggested RC Flying Site Specifications" document mentioned above:
      i. Adequate take-off and landing areas must be present.

ii. Additionally, the proper airspace as identified above, and the appropriate airspace for operation of aircraft must be determined before flight during the pre-flight procedures.
iii. The size that is determined should allow for a margin of error that would provide ample space in case of an emergency or unexpected incident.

c. Recreational pilots must understand the difference between Controlled and Uncontrolled Airspace, which can be found here.

i. Uncontrolled Airspace Operations:

1. Uncontrolled Airspace is where "air traffic controllers are not directing air traffic within its limits."
2. Keep your model aircraft below 400 feet above-ground-level (AGL) in Class G airspace.

ii. **Controlled Airspace Operations of Model Aircraft**: When flying in controlled airspace (i.e. Classes B, C, D, and E), all model aircraft or UA operations must be authorized by the FAA, unless operating at an approved fixed flying site.

1. **It is highly recommended** that the pilot uses the FAA smartphone app "B4 You Fly" to determine the airspace that will be utilized before you fly.
2. Pilots should also refer to the FAA's interactive map on the UAS Data Delivery System to access all notifications regarding airspace restrictions and prohibitions.
    a. On the map, semi-transparent polygons depict airspace information. UAS flight restrictions are shown as red polygons.
3. The FAA publishes TFR are updated here, and Aeronautical Navigation Products (Charts) at here.
4. For pilots flying at an approved fixed flying site in controlled airspace, there must be a Letter of Agreement (LOA) established with FAA air traffic control (ATC) to serve as official authorization for operations.
5. When flying in controlled airspace outside of an approved fixed flying site, pilots/operators must obtain clearance through an authorized Low Altitude Authorization and Notification Capability (LAANC) provider.
    a. LAANC is available to recreational UAS operators to quickly receive authorization to fly and can only be used for daylight operations at or below 400 feet.
        i. More info on LAANC can be accessed here.

10. Pilots must keep their model aircraft (sUAS) within your visual line of sight (VLOS).

a. VLOS - Visual Line Of Sight: The ability of the operator, or a visual observer co-located and in direct contact with the pilot/operator, to see and maintain visual line of sight of the model aircraft unaided by any technology other than glasses or contact lenses and without creating a distraction to the recreational flyer.

i. This means either the pilot or a visual observer/spotter (VO) must be able to see the sUAS (i.e. its location, altitude, attitude and flight path), with vision unaided by any device other than corrective lenses, throughout the entire flight to ensure it does not present a collision hazard to other manned or unmanned aircraft.

1. VO - Visual Observer (Spotter): Person who assists the sUAS operator avoid conflicts with manned aircraft and other changes adversely affecting the aircraft's

operating area such as non-participating personnel entering the area, changing flight conditions, etc.

2. Vision aids, such as binoculars, may be used only momentarily to enhance situational awareness.

11. Flying near or in proximity to other people and/or spectators must be done within set parameters.

a. Do not fly your model aircraft closer than 25 feet laterally from other pilots on the designated flight line.
b. Do not fly your model aircraft closer than 50 feet laterally from other people/spectators in the designated spectator area.
c. Do not fly a model aircraft directly over people.
    i. The FTCA does not permit recreational flyers to fly over people or so close as to create a potential hazard should the aircraft, or pilot, not perform as intended.

12. First Person View (FPV) operation of recreational model aircraft must be done safely and in compliance with Congressional law §44809(3).

a. When flying with First Person View goggles (or similar devices that block your view of the surrounding airspace), you must have an individual act as a spotter to monitor the airspace for any manned or unmanned air traffic.
    i. Long-range FPV is not permitted as it is considered Beyond Visual Line of Sight.
b. FPV flyers should be proficient in flying their recreational model without an FPV device prior to starting FPV flights.
c. FPV flyers should perform preflight inspections of the FPV device's video, control, power source, and mechanical systems before each flight.
    i. When flying in a group, ensure that your group coordinates VTX channels and power settings.
    ii. Always announce your intention to power up your FPV aircraft.
d. FPV operations require someone to be watching the UA at all times to ensure safe operations. This requires the use of a visual observer.
    i. VO - Visual Observer (Spotter): Person who assists the sUAS operator avoid conflicts with manned aircraft and other changes adversely affecting the aircraft's operating area such as non-participating personnel entering the area, changing flight conditions, etc.
e. Visual observers must be co-located with the FPV flyer and maintain visual line of sight (VLOS) with the aircraft at all times.
f. FPV flyers must have the capacity to see the aircraft at all times.
    i. Although a visual observer may be watching the UA, the FPV flyer must ensure that, throughout the operation of the UA, he or she would have the ability to immediately see the UA if the FPV device was removed.
g. The FPV flyer and visual observers should have preplanned communications and procedures to ensure the UA remains under control and within VLOS during any event when the safe operation of the aircraft is in question.
    i. A predetermined communication of the need for VO assistance should be established during preflight procedures.
h. An FPV system should not be used when the weight of the UA exceeds 55 pounds.

13. **In the case of emergency, the immediate safe landing of an aircraft is the proper initial action to take.**
    a. The recreational flyer is responsible for the safety of the flight during emergencies.
    b. If a safe landing is not possible, the pilot should make his/her best attempt to divert the aircraft away from any people, structures, or vehicles.
    c. Following are a few instances where the circumstances could result in an emergency:
        i. Sustained loss, weak, or intermittent radio signals or control signals experiencing interference.
        ii. Flight instruments losing performance or displaying incorrect information.
        iii. Unanticipated people or aircraft (manned or unmanned) entering the area of operation.
        iv. A UA not responding predictably to control inputs.
        v. Parts or attachments on the UA becoming loose or breaking off.
        vi. Electrical arcing or battery/component fires.
        vii. Unexpected weather (e.g., high winds, sudden storms, fog).
    d. Actions to be taken by FTCA members and leadership in the case of an emergency of a model aircraft:
        i. Ensure everyone is safe.
            1. Deal with injuries and/or event
                a. Ensure a First Aid kit is available and known to event staff
                b. Ensure fire extinguishers are readily accessible and in known locations
        ii. Note any damage to property beyond model aircraft damage and report it to the person/persons in charge of the location one is flying.
    e. All emergencies/incidents are to be reported to the local FTCA representative of the group or flying site in order to properly ensure the resulting course of actions.
    f. Consider as a best practice reporting the incident to sUAS ASRS, https://asrs.arc.nasa.gov/uassafety.html as a way to share the lessons learned from the incident.

14. **Night operations should only be attempted when a clear understanding of the special requirements are met**.
    a. Night flight presents visual perception challenges as a result of your vision and depth perception being altered in darkness.
    b. It is required that the aircraft be equipped with anti-collision lighting that can be seen from 3 statute miles, and additional lighting must be arranged in such a way that allows recreational flyers to determine the orientation of the aircraft.
    c. Flying at night without proper anti-collision lighting in areas that are sufficiently illuminated, e.g. large stadiums, so that members can maintain VLOS, is permitted.
    d. No lighting of the model aircraft (whether anti-collision, navigation or optional accessory) should produce a hazard or cause distraction to the pilot and must also be able to be turned down or turned off if necessary.
        i. Minimum required navigation and anti-collision lighting must still be visible in order to maintain VLOS.
    e. Prior to your flight at night, check for obstacles that may not be easily seen in the dark.

f. Additional instruction for night flying:
    i. Pilots new to night flying should fly with an experienced pilot to become proficient to fly on their own.
        1. Learning the craft of night flying is best taught by one-on-one hands-on flight training with an experienced pilot.
    ii. View night flying quick tips, (Flite Test Night Flying Tips).
g. Visual perception challenges must be understood per FAA-H-8083- 3C, Airplane Flying Handbook, Chapter 11, Night Operations.

15. **Assisted flight modes are allowed, and should only be used, provided the pilot remains in direct connection to the system and flies within visual line of sight; and must be able to override any automated and programmed features at all times.**
    a. Pilot-assisted flight modes should only be engaged if there is an override ability which allows the remote pilot to take over full control of the aircraft.
        i. When using such modes in a location where there may be manned air traffic, you or an assistant must always maintain the ability to engage the override and resume direct control of the model aircraft.
        ii. It is a best practice to also have an override capability for Failsafe modes that may provide a return-to-home or return-to-launch assist.
16. **Compliance with these safety guidelines and Congressional law §44809, as reprinted below, are mandatory for FTCA members.**

In addition to operating within the FTCA safety guidelines, FTCA members should comply with any and all applicable federal, state, and local laws and regulations.

On October 5, 2018, the U.S. President signed the FAA Reauthorization Act of 2018 into law. The Exception for Limited Recreational Operations of Unmanned Aircraft established by section 349 contains eight statutory requirements that recreational and educational fliers must adhere to operate recreational UAS (model aircraft).

1. The aircraft is flown strictly for recreational, or educational purposes.
2. The aircraft is operated in accordance with or within the programming of a community-based organization's set of safety guidelines that are developed in coordination with the Federal Aviation Administration.
3. The aircraft is flown within the visual line of sight of the person operating the aircraft or a visual observer co-located and in direct communication with the operator.
4. The aircraft is operated in a manner that does not interfere with and gives way to any manned aircraft.
5. In Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport, the operator obtains prior authorization from the Administrator or designee before operating and complies with all airspace restrictions and prohibitions.
6. In Class G airspace, the aircraft is flown from the surface to not more than 400 feet above ground level and complies with all airspace restrictions and prohibitions.
7. The operator has passed an aeronautical knowledge and safety test described in subsection (g) and maintains proof of test passage to be made available to the Administrator or law enforcement upon request.
8. The aircraft is registered and marked in accordance with chapter 441 of this title and proof of registration is made available to the Administrator of designee or law enforcement upon request