



## Academy of Model Aeronautics

"AMA Advanced Flight Systems Committee"

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AMA Document #550

### **Radio Controlled Model Aircraft Operation Utilizing "First Person View" Systems**

#### **1. DEFINITION OF TERMS:**

Please refer to Page 5 section 7 which contains an alphabetical listing of the definitions of the terms in italics that are used in this document.

#### **2. GENERAL:**

*FPV* flying of radio control model aircraft by AMA members is allowed only for noncommercial purposes as a hobby/recreational and/or competition activity and must be conducted in accordance with AMA's current National Model Aircraft Safety Code and any additional rules specific to a flying site/location.

#### **3. OPERATIONS – REQUIREMENTS – LIMITATIONS:**

- a) *FPV novice pilots* undergoing training at low altitude must use a buddy-box system with an *FPV spotter*, or must go to a safer altitude if no buddy-box system is used.
- b) All *FPV* flights require an AMA *FPV pilot* to have an AMA *FPV spotter* next to him/her maintaining *VLOS* with the *FPV aircraft* throughout its flight.
- c) The *FPV pilot* must brief the *FPV spotter* on the *FPV spotter's* duties, communications and hand-over control procedures before *FPV flight*.
- d) The AMA *FPV spotter* must communicate with the *FPV pilot* to ensure the *FPV aircraft* remains within *VLOS*, warning the *FPV pilot* of approaching aircraft, and when avoidance techniques are necessary.
- e) During an *FPV* flight, the *FPV spotter* must be prepared to acquire the transmitter/control from the *FPV pilot* and assume *VLOS* control of the model aircraft at any time safe operation of the flight is in question.
- f) If an *FPV pilot* experiences a safety issue that does not appear to be a brief glitch, they must abandon *FPV* mode and fly *VLOS*.
- g) Before the initial *FPV* flight of an *FPV model aircraft* and/or after any changes or repairs to *essential flight systems*, the *FPV model aircraft* must have an *R/C test flight* by conventional *VLOS*.
- h) *FPV model aircraft* must use frequencies approved by the FCC for both the RC system and the wireless video system. Pilots must meet applicable FCC licensing requirements if they choose to operate the RC flight control system or the wireless video system on Amateur Band frequencies.
- i) AMA *FPV pilots* must first be capable of flying their *FPV* model aircraft manually before utilizing *FPV* flight.

#### **4. RANGE – ALTITUDE – WEIGHT – SPEED:**

- a) One of the requirements in Federal Law (Public Law 112-95 Sec 336 (c) (2) February 14, 2012) for model aircraft to be excluded from FAA regulations is that model aircraft must be flown within VLOS of the operator.
- b) Model aircraft flown using *FPV* must remain at or below 400 feet AGL when within 3 miles of an airport as specified in the AMA Safety Code.
- c) Model aircraft flown *FPV* are limited to a weight (including fuel, batteries, and onboard *FPV* equipment) of 15lbs. and a speed of 70mph.

#### **5. RECOMMENDATIONS & INFORMATION:**

- a) AMA *FPV novice pilots* should consider using a cockpit view flight simulator to become accustomed to *FPV* flight.
- b) AMA *FPV pilots* should consider using a programmable *autopilot* (AMA Document #560) with a failsafe “return to launch” (RTL) feature that will maintain control of the aircraft in the event of signal loss.
- c) When purchasing *FPV* operational systems, always try to select quality equipment, verify its compatibility, install components for interference rejection, and determine that signal range is adequate for maximum VLOS range.

#### **6. PRIVACY PROTECTION SAFEGUARDS:**

The use of imaging technology for aerial surveillance with radio control model aircraft having the capability of obtaining high-resolution photographs and/or video, or using any types of sensors, for the collection, retention, or dissemination of surveillance data information on individuals, homes, businesses, or property at locations where there is a reasonable expectation of privacy is strictly prohibited by the AMA unless written expressed permission is obtained from the individual property owners or managers.

#### **7. DEFINITIONS OF TERMS:**

**AMA *FPV Pilot*** is an AMA member who is capable of maintaining stable flight of a model aircraft within its intended flight envelope when flown *FPV* without losing control or having a collision.

***Buddy-Box System*** is a system that has one transmitter operating as the master controller, while a second transmitter is linked/slaved to it allowing dual control of an aircraft. The operator of the master transmitter allows one or the other transmitter to control the aircraft through the use of a spring-loaded switch. The switch provides instantaneous transfer of control from one transmitter to the other. The buddy-box system is an efficient and effective means of achieving a position transfer of control from one pilot to another.

Although this system is commonly used for training novice fliers, it is also useful in situations where an experienced pilot may have an increased likelihood of needing a second pilot's assistance in maintaining control of the aircraft. The use of the buddy-box may be helpful in assisting pilots with physical limitations, flying in congested environments, during times of reduced visibility, or anytime during FPV when a timely transfer of control may be beneficial.

**Essential Flight Systems** are any systems or components necessary to maintain stable flight within a model aircraft's flight envelope. (This includes primary radio control systems and any stabilization or gyros required to maintain stability and heading in certain types of model aircraft that would be uncontrollable/unstable without their use).

**First Person View (FPV)** refers to the operation of a radio controlled (R/C) model aircraft using an onboard camera's cockpit view to orient and control the aircraft.

**Flight Envelope** is defined as the range of airspeeds, attitudes, and flight maneuvers which a model aircraft can safely perform/operate for its intended use.

**FPV Aircraft** is an RC model aircraft equipped with a video transmitter to send real-time video images from an onboard camera to a ground based receiver for display on a pilot's video monitor/goggles. (*FPV model aircraft* types include: Fixed Wing, Rotary Wing, and Multi-Rotor Platforms).

**FPV Novice Pilot** is an AMA member learning to fly *FPV* utilizing a buddy-box system with an experienced AMA *RC pilot* operating the master transmitter and serving as the *FPV spotter*.

**FPV Spotter** is an experienced AMA *RC pilot* who has been briefed by the *FPV pilot* on the tasks, responsibilities and procedures involved in being a spotter; is capable and mature enough to perform the duties and is able to assume conventional *VLOS* control of the aircraft.

**Non-Essential Flight Systems** are any systems or components that are not necessary to maintain stable flight within the model aircraft's *flight envelope*. (This includes *autopilot* or *stabilization systems* that can be activated and deactivated in flight by the pilot without affecting stable flight).

**R/C Test Flight** requires an *AMA Pilot* to manually operate an R/C transmitter to control a model aircraft's flight path and determine if the aircraft is capable of maintaining stable flight within its *flight envelope*.

**Visual Line Of Sight (VLOS)** is the distance at which the pilot is able to maintain visual contact with the aircraft and determine its orientation without enhancements other than corrective lenses.