OCALA FLYING MODEL CLUB
PILOT TRAINING MANUAL

Type Name Here

Student Pilot Name

Introduction:

This pilot training program is designed for an individual who has not previously been trained and certified to fly remote controlled aircraft with a sanctioned Academy of Model Aeronautics (AMA) club. For this reason, an uncertified pilot is not allowed to fly without the assistance of an AMA registered Instructional Pilot or Board of Directors designated IPM (Intro Pilot Mentor).

The intention of this program is to teach someone new to the radio control (R/C) hobby how to successfully fly their aircraft in a safe and fun manner. The amount of time it will take to learn to fly varies significantly with individuals. Some people may become proficient enough to solo in a few sessions at the field, while others may take longer. With patience and perseverance, we believe anyone can become a R/C pilot.

To qualify for this program the student pilot must be registered with the FAA, a member of AMA and a member of Ocala Flying Model Club prior to beginning flight training.

This program works best when the student pilot has his/her own airplane, radio system, and related flight equipment.

Each step in the program must be completed successfully before beginning the next step. The instructor is responsible for determining if the student understands the information and can perform the various maneuvers required.

The program is based on four keystones:

SAFETY – Properly built and flown R/C aircraft present no great risk to anyone. However, in the hands of an inexperience pilot, an airplane or other aircraft can cause considerable damageto property and/or personal injury. Safety will always be the primary consideration in the training program.

SUCCESS – Learning to fly R/C aircraft is a challenge, but one that can be met by everyone. Without an instructor, the beginner is virtually guaranteed of several crashes. It is the intention of the OFMC training program to get a student through the training without crashing. Of course, there are no guarantees since R/C flying is inherently risky.

PROGRESS – This program is a set of orderly steps ending in solo flight.

FUN – The whole point of this hobby is to have fun. Each time you master a new skill, you should feel a great sense of accomplishment and joy.

Disclaimers:

Please keep in mind that the OFMC instructors are ultimately not responsible for your aircraft. The individuals that volunteer their time for the purpose of teaching you to fly are competent pilots. They will, to the best of their abilities, check out your aircraft, radio etc., and instruct you in the safe operation of your aircraft. A "Buddy Box" will be used during your training sessions. If you don't have access to a buddy box OFMC will provide one for use during training. This is the safest way to learn to fly R/C aircraft. If for some reason there is a mishap, the repairs and associated costs are your responsibility. Your instructor and other members will be happy to provide you with advice on how best to complete any required repairs.

FAA requires all unmanned aircraft use "See and Avoid" techniques for collision avoidance with manned aircraft. It is the responsibility of all unmanned aircraft pilots to avoid manned aircraft at all costs.

Prior to beginning instruction:

Prior to training, the student pilot must read the safety code on the AMA website and the field rules for the Ocala Flying Model Club.

1. Register with the FAA to fly small unmanned aircraft systems (sUAS) by visiting the following website:

   https://faadronezone.faa.gov

   Select "Fly Model Aircraft Under Section 336" and follow the propts.

2. Register with the AMA by visiting the following website:

   https://www.modelaircraft.org/membership/enroll

   Select the correct type of membership and follow the prompts.

3. Visit the OFMC website to join our club. Specifically visit the following link:

   http://www.ocalaflyingmodelclub.com/member_info.html

Note: even as a student pilot, if you notice another pilot breaking the field rules you can ask them to abide by the rules. Safety should be everyone's concern.

Now that the legal stuff is out of the way, let's get to the fun stuff.

Aircraft Preparation:

Use the information that came with your aircraft to be sure it is properly set up before coming to the field. Be sure all control surfaces operate properly and the surface throws are as recommended by the manufacturer. Make sure your Center of Gravity (CG) is within the bounds defined by the manufacturer. Acquire all the necessary field items to fly your airplane, such as batteries, fuel, igniter, tools, etc.

The more time you spend getting familiar with your aircraft and the items you will need at the field, the more likely you are to have fun and be successful in your training sessions.

This instruction program will start with an inspection of your aircraft at the club field to ensure that it is ready to fly. Any adjustments or modifications the instructor feels necessary, to fly safely, must be completed prior to commencing training.

If you aren't confident performing these adjustments/modifications on your own, your instructor or many of the other club's experienced pilots can assist you.

Your instructor will re-inspect the plane, with you, before the first flight.

The Buddy Box System:

The "buddy box" system almost eliminates risk to your aircraft and provides an enjoyable learning experience. Two transmitters are used; one for the student and one for the instructor. If you do not have your own "buddy box", OFMC has "buddy box" transmitters and cables for the more popular radio brands.

The instructor controls the aircraft to a safe altitude using the primary transmitter. He depresses a switch on his transmitter, transferring control of the aircraft to the student, who then flies the plane. If the student gets the plane in an unsafe situation, the instructor releases the switch and resumes control of the aircraft to fly it back into a safe situation. The instructor will perform take off and landing procedures of the aircraft until he feels the student is able to do so safely.

Instruction Time:

Weather permitting, instructors may be found at the field at different times; however they will give priority to instructing students that have made an appointment with the instructor. If a student just shows up at the field and hopes to get instruction may not be able to find an instructor. An instructor is not guaranteed to be at the field or may not have time to instruct on that particular day. For these reasons, it is best to contact an instructor from the instructors list prior to showing up at the field.

If your schedule permits you may consider working with more than one instructor to get different perspectives. As a student, select instructors you feel most comfortable with so they may assist you in progressing quickly toward your goals.

To make your time as a Student R/C pilot more enjoyable and productive:

Inspect your aircraft at home to the best of your ability.

Get your model aircraft inspected and corrected if needed before every flight session at the field.

Consider getting flight simulator software for your PC, if you have one. Any time spent on an R/C flight simulator will greatly reduce your training time at the field. A Flight Simulator is available to OFMC members. This is an older version of the Real Flight software and the graphics may not be as up to date as the current generation, however, it is a good tool to start developing hand eye coordination before or during flight training at the field. It is also a great opportunity to see if the purchase of a simulator is for you.

Read the instruction manual for your transmitter. Instructors can't be expected to know how all the transmitters from different manufacturers function. Especially understand how to enable the "trainer' function on your transmitter.

Gas/Glow Engines: Read the instruction manual for your engine. Perform the break-in EXACTLY as instructed. Any break-in opinion expressed by a club member is exactly that: an opinion. It may be a good one, but it may not. If breaking-in the engine at the field, be considerate and do so where the noise will not intrude other club members, well away from the pit area.

Electric Motors: Read the instruction manual for your Electronic Speed Control (ESC) and know how to set its parameters. Read the instructions for your battery charger and know how to charge your batteries.

Bring to the field, the instruction manuals for your radio, aircraft, engine, ESC, Charger and any other equipment as applicable.

Review all pertinent instructions so you know what to expect.

If you make **ANY changes** to your aircraft between instruction sessions, inform your instructor.

The Instructors volunteer their time. Remember that they like to fly their own aircraft too.

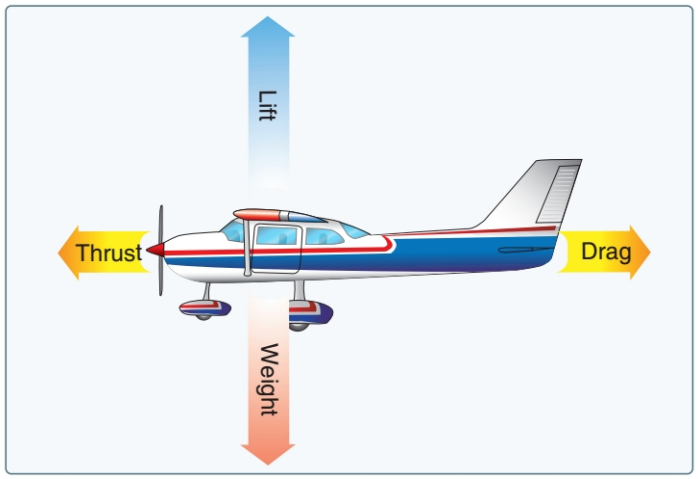
Through the instruction process and beyond, the more you put into the club, the more you will get out of it.

R/C aviation is enjoyable and you will enjoy both the learning process and club membership by following the guidelines above.

Aircraft must stay over the flying field!

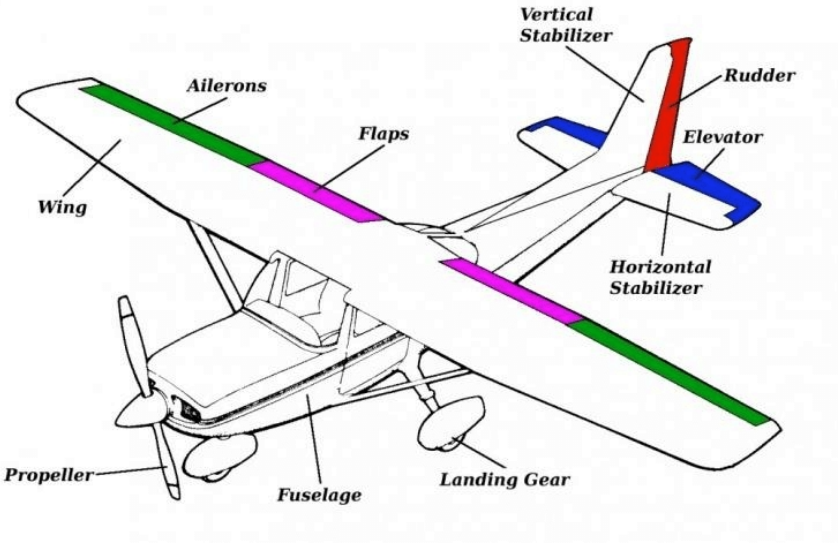
Basics of Flight:

This is a brief introduction to the physical principles that control and allow flight. We will use airplanes to explain these principles. However, all aircraft that fly must adhere to these same principles.



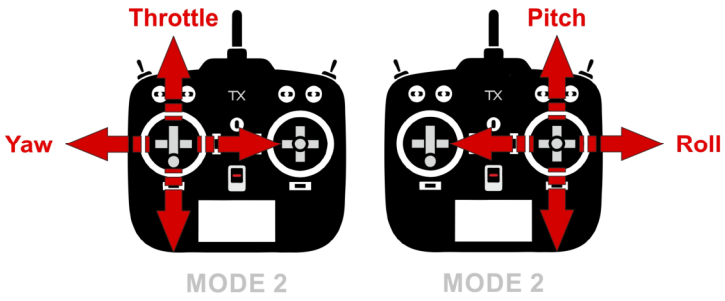
There are four forces that act on an aircraft when it is in flight. These forces are lift, weight, thrust and drag. During straight and level flight the four forces of flight are in balance. When these forces become out of balance the aircraft will leave level flight and the following situations may occur:

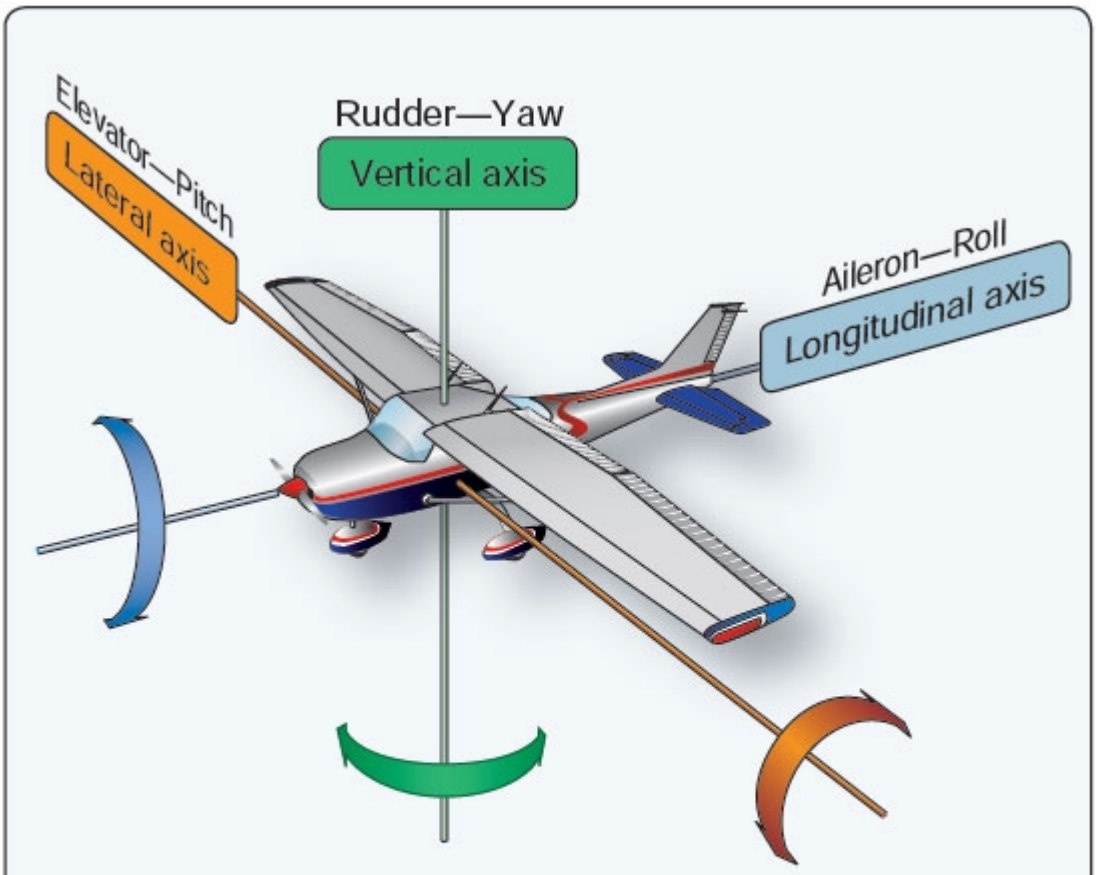
- If lift becomes greater than weight, then the plane will accelerate upward.
- If the weight is greater than the lift, then the plane will accelerate downward.
- When the thrust becomes greater than the drag, the plane will accelerate forward.
- If drag becomes greater than the thrust a deceleration will occur.



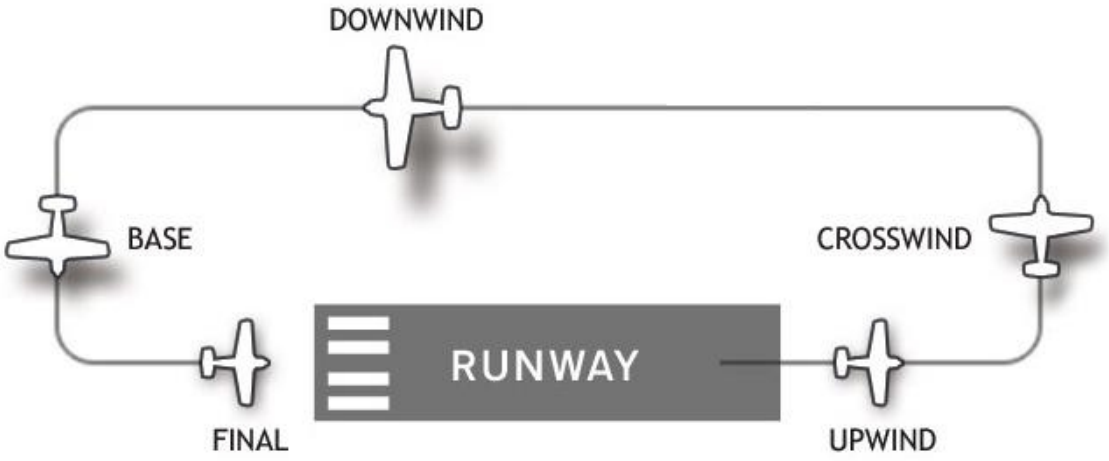
The illustration above shows basic airplane parts and control surfaces with the proper terminology. Knowing these items and their terminology will help you talk to your instructor and other pilots.

The mode of the transmitter describes which stick controls which of the aircrafts control surfaces. As most transmitters in the United States are set-up on Mode 2, we will briefly go over how the transmitter controls your aircraft.





Primary control surface	Airplane movement	Axes of rotation
Aileron	Roll	Longitudinal
Elevator/stabilator	Pitch	Lateral
Rudder	Yaw	Vertical



The above diagram shows the basic concept of take-off and landing pattern with the terminology describing each stage of the pattern. Learning these items and their terminology will help you understand commands from your instructor.

This figure was taken from an article in Model Aviation May 2018 by Dave Scott titled "Maneuver your Aircraft Like a Pro
Minimal, Precise Inputs are Key"

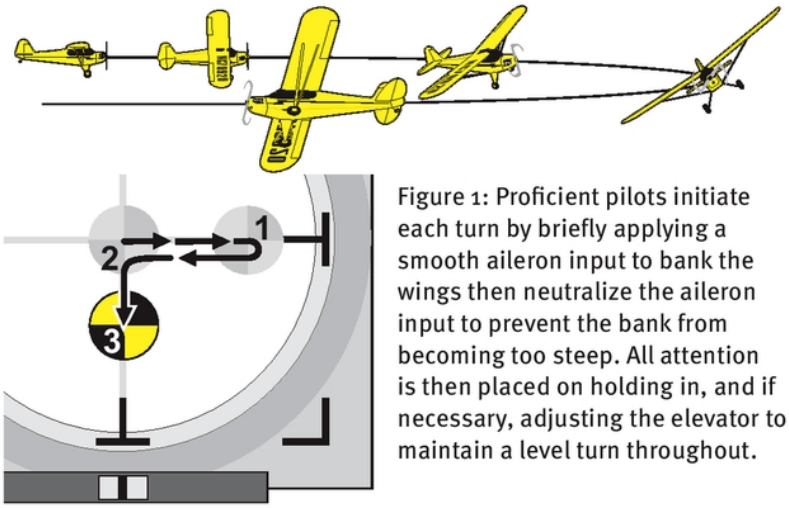


Figure 1: Proficient pilots initiate each turn by briefly applying a smooth aileron input to bank the wings then neutralize the aileron input to prevent the bank from becoming too steep. All attention is then placed on holding in, and if necessary, adjusting the elevator to maintain a level turn throughout.

This is a very good article for pilots that want to increase their skills.

Using this technique will perform a proper aileron turn. A common error made by new pilots is to put in control for aileron and elevator simultaneously. This will cause the airplane to pitch up sharply at the beginning of the turn.

This basic knowledge will allow you to begin a successful flight training program. Please understand that this is only the most basic knowledge to begin your training. Your instructor will expand on this basic knowledge throughout your training sessions. If there are any terms or concepts that are not clear to you, make sure you ask your instructor to expand on the term or concept.

With these concepts in mind, it is now time to begin your training.

Method of Instruction:

The teaching method for each task will consist of four parts:

1. **DESCRIPTION**: Prior to take-off, the instructor will describe the maneuver to be done along with any information necessary to do it.
2. **DEMONSTRATION**: After take-off, the instructor will demonstrate how to do the maneuver. The instructor will first perform the task and describe what you should expect during and after the maneuver.
3. **PRACTICE:** The student will then perform the maneuver. It may be necessary to practice a particular task many times before proficiently performing it.
4. **EVALUATION:** The instructor will evaluate the student's progress and determine if more instruction is necessary or if the student is ready to move on to the next task.

Student Pilot Task Goals

Each flying session should start with the instructor and student reviewing and performing the pre-flight checklist

Tasks 1 - 2 are to be performed by the instructor with the student present

_____ _____
Instructor Date

Task #1: Prepare Aircraft for Maiden Flight

- Review basics of flight section with instructor
- Perform pre-maiden checklist with instructor

_____ _____
Instructor Date

Task #2: Perform Maiden/Orientation Flight

- Instructor to perform taxi test
- Student to observe maiden/orientation flight. Note ground and flight safety restrictions.

Tasks 3 - 13 are to be performed with the use of a "Buddy Box" system

_____ _____
Instructor Date

Task #3: Basic Flight Skills Development

- Become familiar with speed, yaw, pitch, and roll commands.
- Become familiar with flight trim techniques.
- Execute straight and level flight.
- Execute left and right turns.

Task #4: Turns

Instructor Date

- Perform constant altitude shallow turns (left & right) at approximately a 20˚ bank angle.
- Perform constant altitude medium turns (left & right) at approximately a 40˚ bank angle.
- Perform constant altitude steep turns (left & right) at approximately a 60˚ bank angle.
- Execute shallow, medium, and steep turns (left & right), constant altitude flight, at low, medium, and full speeds.

Task #5: Take-off

Instructor Date

- Execute proper upwind takeoff runway alignment.
- Initiate takeoff throttle setting.
- Maintain runway centerline ground steering during takeoff acceleration (rudder).
- Execute takeoff rotation at proper speed.
- Execute proper climb speed, pitch, and bank angle.
- Perform a takeoff abort if required.

Task #6: Planning Maneuvers

Instructor Date

- Perform constant altitude rectangular patterns (left & right) as well as figure eights over specific ground location(s).
- Apply crosswind technique (rudder) to maintain proper ground tracking during planning maneuvers.

Task #7: Unusual Attitude Recovery

Instructor Date

- Recover from student initiated high altitude stall
- Recover from instructor initiated unusual attitude.

Task #8: Aerobatic Maneuver

Instructor Date

- Execute acrobatic maneuver.
  Suggested maneuvers:
  Loop, Hammerhead Stall, Barrel Roll, Etc.

Task #9: Landing Pattern and Go-around

Instructor Date

- Execute upwind landing patterns (both left and right).
- Execute crosswind landing proceedures.
- Perform go–arounds at a 10 foot altitude on final approach.

Task #10: Full Stop Landing

Instructor Date

- Execute full stop landing followed by taxi back to taxi way.

_____	_____	**Task #11: Supervised Solo Flight**
Instructor	Date	• Perform Take-off • Aircraft should join the established pattern • Perform full stop landing
_____	_____	**Task #12: Touch and Go Landing**
Instructor	Date	• Perform traffic pattern(s), final approach, and touchdown, followed by power application and pattern reentry. • Perform normal and crosswind traffic patterns with touch−and−go maneuvers.
_____	_____	**Task #13: Execute Simulated Engine failure Landing**
Instructor	Date	• Execute simulated engine failure landing.

Tasks 14 - 15 are to be performed by the student with the instructor present

_____	_____	**Task #14: Prepare for Solo Examination**
Instructor	Date	• Practice all previous tasks to refine proficiency • Instructor will emphasize areas needing improvement
_____	_____	**Task 15: Solo Examination**
Instructor	Date	• The solo exam shall be administered by a separate instructor that has not previously instructed the student

Solo Flight Examination

Pre-flight

__ Perform preflight checklist.

Take-off

__ Perform a successful take-off while remaining over the runway (asphalt or grass).

__ Two take-off aborts are allowed.

Pattern

__ Pilot is to join the established pattern.

__ Pilot is to make a minimum of 1 full lap maintaining the pattern.

Planning Maneuvers

__ Pilot is to perform a climbing rectangle while maintaining flight within the pattern.

__ Pilot is to perform a descending rectangle while maintaining flight within the pattern.

__ Pilot is to perform both a right hand and left hand figure eight. After figure eights pilot needs to return to pattern flight.

Aerobatic Maneuver

__ Pilot is to perform a minimum of one acrobatic maneuver.
Examples of acceptable maneuvers:
Loop, Hammerhead Stall, Barrel Roll, Prolonged inverted flight (including a minimum of one turn encompassing 180 degrees), Other maneuver of similar difficulty

__ After aerobatic maneuver pilot is to return to pattern flight.

Landing

__ Pilot is to perform a successful safe landing on the runway (asphalt or grass, students choice). Go-around as necessary for safe landing. No damage to the airframe allowed. A broken prop or bent landing gear will be allowed.

_____ _____

Solo Flight Examiner Date

Pre-maiden Checklist:

General

__ AMA number & proper identification - Name and address on aircraft.
__ Center of Gravity is properly set.

Structural

__ Tail surfaces are aligned and secure.
__ Landing gear and wheels secure.
__ Ground steering wheel taxis straight.
__ Wing is properly secured.

Servos and Control Surfaces

__ All servos and servo horns secure.
__ All control horns secure - clevis' secure with safety retainers.
__ All control surface hinges secure with minimal gap. Free moving with no binding.

Engine and Mounting

__ Engine mount secure to firewall. Engine bolts secure to mount.
__ If required engine is “broken in” and tuned properly.
__ Throttle cut set properly and working.
__ Propeller & spinner secure - propeller properly balanced & undamaged.

Radio and Batteries

__ All batteries are fully charged and secure.
__ Control surfaces move in the correct direction.
__ Check any additional controls or servos for proper operation.
__ All switches in safe and proper position.
__ Perform a range check.

Pre-flight Checklist (should be performed at beginning of each flight session)**:**

Structural

__ Tail surfaces are secure.

__ Landing gear and wheels secure.

__ Wing is properly secured.

Servos and Control Surfaces

__ All servos and servo horns secure.

__ All control horns secure - clevis' secure with safety retainers.

__ All control surface hinges secure with minimal gap. Free moving with no binding.

Engine and Mounting

__ Engine mount secure to firewall. Engine bolts secure to mount.

__ Throttle cut is turned on.

__ Propeller & spinner in good condition (without damage) and secure.

Radio and Batteries

__ All batteries are fully charged and secure.

__ Control surfaces move in the correct direction.

__ Check any additional controls or servos for proper operation.

__ All switches in safe and proper position.

__ Perform a range check.