



Indianapolis RC South Flight Instruction Guide

Pilot's Name

Home Base

Phone Number

Introduction

Welcome to RC flying. This guide will help you learn to fly your radio-controlled plane correctly and safely. Please keep it with you to help provide a pilot training progress reference for both you and your instructors — think of it as your log book.

All full-scale pilots maintain a log of their flying hours to demonstrate experience and proficiency. This guide will help tell you what to expect at each stage of your learning experience, and allow several different instructors that may be helping you, to understand your level of progress.

Instruction Availability

Instruction is available at RC South every Tuesday and Thursday evening during the flying season. Just show up at the field and, depending on the number of student pilots, you can obtain help as the instructor's time permits. To ensure you will have help on a given evening, call and make prior arrangements with an instructor in advance. Those available are listed on the field bulletin board.

Except for a single orientation flight with an instructor's aircraft, you must be a member of the Academy of Model Aeronautics (AMA) and a member of the Indianapolis RC South flying club to use our facility. This is to ensure that all those using our facility have liability insurance coverage and subscribe to the necessary rules of safe operation for all models using the facility.

When you have satisfied these requirements, you will be issued this book, which has several stages of progress that will be signed-off by your instructors on your way to soloing your RC aircraft. Please take a moment and record your name and address on the cover of this booklet.

Flight Training

Flight training is separated into a Preflight Session, Six (6) stages — or *Phases* — of actual hands-on flight training that culminate in the new pilot flying solo, and a follow-up session of Emergency Procedures and Flight Techniques. Each of these phases is of indeterminate length depending on the progress of the student, and may require several evenings of flying depending on the evaluation of the instructor.

The descriptions of each Phase in this booklet contain step-by-step suggestions for student practice to demonstrate proficiency in the identified skills. Each phase must be signed-off by one of the designated instructors listed on the bulletin board at the field, before progressing to the next phase.

Note: It is not the intent of this program to slow the progress of easily adapting students, rather, to ensure all aspects of flight training are covered in the training program.

When a student has soloed, there is an additional optional phase of training, that is intended to help with emergency procedures, elementary aerobatics, and suggestions for adverse wind condition operation.

Field Rules and Courtesies

To cleanly communicate with one another while using our field, and to ensure we don't infringe on each other's activities, there are specific rules and courtesies that must be followed for all of us who use this facility. You and your instructor will go over these in detail, please ask questions if you don't understand any of these important aspects of using the facility.

Field Operational Rules

1. Only Radio-Controlled aircraft may be operated from this facility.
2. All radio equipment must comply with FCC regulations.
3. Transmitters may not be turned on until the appropriate frequency is reserved by placing the flyer's club card or AMA card in the pocket on the frequency board, and obtaining the frequency pin.
4. Every member is responsible for complying with, and enforcing, club rules.
5. All flyers and their guests must be current members of AMA and be able to supply proof of membership.
6. Guests may use the field on a limited basis provided they are in the company of a current club member. In such cases the hosting member is responsible for enforcing club rules.
7. Mufflers are required for all engines larger than .15 cu. in.
8. No alcoholic beverages are allowed at this facility.
9. No spectators are allowed beyond the safety fence.
10. Wind conditions shall determine the active runway. In light wind conditions, the first pilot may choose the runway; in changing wind conditions all current flyers may change the active runway by consensus.
11. AMA safety rules shall be observed and enforced. All pilots shall maintain a safe distance between their aircraft and other pilots on the flight line.
12. No flying is permitted before 8:00 am. Restricted airspace includes: over the pit area, anywhere near homes in the proximity of the field, and beyond the power lines south of the field.
13. Flights should be limited to ten minutes duration.

14. Helicopters must follow the same rules as fixed-wing aircraft, and may not be hovered in, or over, the pit area. Hovering for test or instructional purposes is allowed in the designated area to the North West of the shelter house and shall not conflict with the use of the NW diagonal runway. Hovering shall be kept below shoulder height. Helicopters must be carried to and from the active runway. Helicopters shall take off and land from the rough grass approximately 30 feet on the East side of the active runway and in front of the pilots on the flight line.
15. All flyers are to position themselves near the downwind end and on the west side of the active runway. A reasonable distance should be maintained between all pilots.

Field Operational Courtesies

1. Please use a timer to limit flights to ten minutes.
2. Please prepare your aircraft for flight while awaiting the frequency pin.
3. Please turn your transmitter off and return the frequency pin to the board immediately after concluding a flight.
4. Please use the taxiways as a means of entering or exiting the active runway.
5. Airborne planes enjoy the right-of-way over planes on the ground. Pilots wishing to take off shall obtain verbal OKAY from flying pilots *before* entering the runway.
6. Please taxi beyond the position of pilots beside the active runway before accelerating for takeoff.
7. Please stand back 10 feet from the active runway while flying.
8. Please announce to adjacent pilots, in advance, any low level maneuver (landings, low passes, touch and go, bomb drop, aerobatics, etc.) over, or directly above, the runway mowed portion of the field. to avoid surprises or conflicts (landings, low passes, touch and go, bomb drop, etc.). Please announce any 3D, (hovering and/or abrupt change in direction), low level maneuver over the mowed part of the field to avoid airspace conflicts. If other pilots on the flight line are not comfortable with close in maneuvers, please wait until those pilots have landed.
9. Please give aircraft in distress a landing priority, and allow the pilot any landing area in which he feels comfortable.
10. Please limit low-level and runway maneuvers according to the number of active aircraft.

Safety Tips

The following tips have been developed from the experience of our members and are presented here in the spirit of passing on information that will help you enjoy the operation of your model with less risk of mechanical failure or injury. They are in addition to the AMA safety code that is posted at all AMA fields.

Engines and Propellers

1. *Always use an electric starter*, or “Chicken Stick,” to start your engine. Fingers don’t grow back very well!
2. Always adjust your engine from behind the airplane. *Never Reach over the propeller.*
3. Handle hot engines carefully to prevent burns.
4. *Never put anything into a running propeller to stop an engine* — Pull the trim to zero, or remove the fuel line instead, and the engine will stop when the fuel in the carburetor is exhausted.
5. *Check the security of your propeller nut* regularly to ensure it is tight. A loose prop flying free is a dangerous missile.
6. *Balance all your propellers* to avoid unnecessary vibration.
7. *Remove all sharp edges from composite propellers* by scraping with a knife or scraper before use. This saves finger cuts.
8. *Paint the tips of propellers* to make the arc more visible when the engine is running.
9. *Propellers with nicks, cracks, or splits should be discarded.* They cause engine vibration, and may fracture with the potential for eye or other personal injury.

Radio Equipment

1. *Never turn on a radio transmitter unless the frequency pin is in your possession.* If you do you may cause another flyer to crash, and *you will be responsible* for any damage that is incurred.
2. *Never tamper with the length of your receiver antenna.* The length provided is critical to the signal reception from your transmitter.
3. *Always charge your batteries the night before you fly*, or use a field charger that is designed for quick charging.
4. *Do not fly if you suspect something is wrong with your radio equipment or batteries.* If you do, you are risking equipment damage or injury to yourself and others.

Installation and Maintenance

1. When centering servo arms, be careful to reinstall the screw, or a control servo may become disconnected during flight.
2. Be certain all control surfaces move freely without drag.
3. Check to ensure all control surfaces are moving ***in the correct direction*** in response to transmitter input.
4. When installing fuel tanks be certain the “clunk” is free to move with changes in tank attitude. Be sure the stopper is secure, and that there are no kinks in fuel lines.
5. Practice the habit of checking batteries before and after each flying session with a good, expanded-scale voltmeter. This practice can help spot potential battery failure before it occurs.
6. Regular preventive maintenance can save your model from an early grave. After each flying session check:
 - for loose covering
 - wheels
 - control surface hinges
 - wing attachment bolts, dowels, or blocks
 - servos, and servo trays
 - engines, and engine mounts

Phase One - Control and Flight Fundamentals

Objective — Allow the student to become familiar with the model's controls and their use in basic flight maneuvers.

1. The Instructor flies and lands the student's model to evaluate its performance and airworthiness. This includes a demonstration that a properly trimmed aircraft will fly straight and level for a short distance with "hands-off" the controls.
2. On the ground, the student becomes familiar with the controls and what kind of reactions to be expected from them.
3. A Buddy-box is used for dual-control, or the procedures necessary to pass the transmitter between Instructor and student during flight training are defined prior to takeoff.
4. With the model trimmed in level flight and a reasonable airspeed, the student is given control of the plane and allowed to become familiar with basic bank and elevator control.
5. Shallow left and right turns are executed to allow the student the feel of control. It should be noted that simple turns result in loss of altitude. At this point it should be enough to level off periodically and climb to regain altitude until the student is comfortable turning and dealing with control disorientation between approach and departure directions.
6. Turns using up elevator are now introduced to overcome the tendency of the planes nose to drop during banks. Turns with gradually increasing up elevator (back stick) should be practiced until both left and right turns can be executed without losing altitude.
7. Climbs and descents are next practiced to spiral up or down while making complete turns in a gentile circle. It helps to picture the threads of a screw and try to achieve a consistent spiral course.

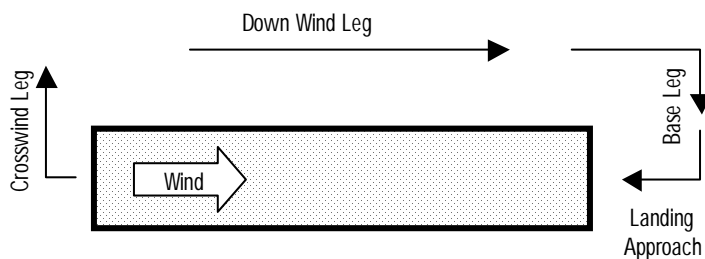
Evaluation

When the instructor is satisfied that the student is proficient in these elements of control, when they can be accomplished smoothly and without the intervention of the instructor, the Phase One checklist item may be signed-off on the student's Overall Training Log.

Phase Two — Level Flight and Patterns

Objective — To gain proficiency in five basic maneuvers that are related to points on the ground. The goal is to place the aircraft where the pilot wants it, not where the wind is carrying it, or the plane wants to go.

1. Straight and Level flight is practiced by flying an imaginary line along the edge of the field in both directions. Small corrections are needed to compensate for wind or throttle settings. Proficiency is judged by how straight a flight path is achieved.
2. Figure eight's are practiced next at a safe altitude. Initial irregular paths are flown in both directions until both loops resemble a circle, and the midpoint, or intersection point, from the exit of both circles is at approximately the same point
3. Complete circles (both left and right) are next practiced with a minimum of at least three complete circles in each direction. Learning to correct for wind drift is important to achieving proficiency in these maneuvers.
4. Rectangular patterns that approximate the landing pattern, but at much greater altitude are practiced next. The student is learning to be proficient in his/her ability to fly a specific rectangular pattern *in both directions*. The simulated Downwind and Final legs should be parallel to the runway and all turns should be 90 degrees.



5. At this point the student should be able to fly the aircraft to specific positions around the field in response to the direction of the instructor. And this type of exercise should be practiced as a demonstration of control and proficiency.

Evaluation

When the instructor is satisfied that the student is proficient in these elements of control, when the student can demonstrate an ability to fly the plane where the instructor asks for it to be flown, The Phase Two checklist item may be signed-off on the student's Overall Training Log.

Phase Three — Slow Flight and Take off

Objective — To become familiar with the flight performance characteristics of the trainer being used and learn decision making skills and instinctive responses necessary for dealing with abnormal situations. And to learn to take off.

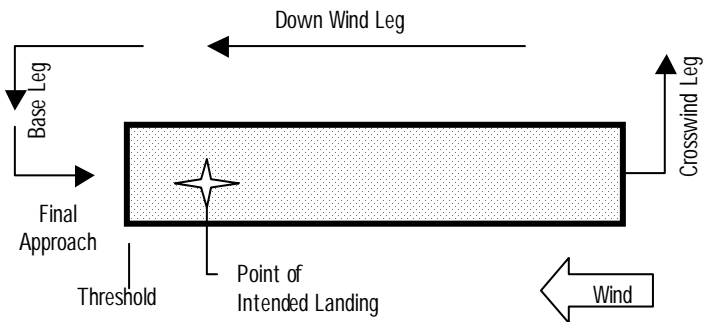
1. A Stall is the speed at which an aircraft stops flying: the wing no longer has enough airspeed to lift the plane's weight, or the wing is at too great an angle of attack. If a stall occurs, the pilot needs to: Apply power, push the nose of the plane to the horizon, and wait for airspeed to return. Then climb slowly. Stalls are practiced at idle, medium power, and full power so these corrective reactions become instinctive and instantaneous.
2. Slow flight. An RC pilot needs to learn to handle an aircraft at slow speeds so he/she can recognize when it is approaching its Minimum Controllable Airspeed (MCA). This is the slowest speed at which the plane can fly without losing altitude. Practice Circles, Figure Eights, and Rectangular Patterns with the throttle back and with some altitude to allow recovery if over-correction causes a stall.
3. Power-off glides are next performed to gain experience in maneuvering the model to a specific area and altitude. Example: Close the throttle at one end of the field and glide to the other end of the field retaining as much altitude as possible. This maneuver should be practiced with altitude to allow recovery from an inadvertent stall.
4. Take-off is learned next. This always requires careful attention to safety of others on the flight line. After rolling past all other pilots on the line, full power is applied while steering with the rudder/nose wheel control. The pilot must make small but precise steering control inputs all the way down the runway. Once off the ground, the aircraft should climb out gently and bank into the pattern *away* from the pits.

Evaluation

When the instructor is satisfied that the student is proficient in recovering from stalls, can fly the aircraft slowly maintaining airspeed just above a stall, and student has control of the aircraft during all legs of both right-to-left and left-to-right take-offs, the Phase Three checklist item may be signed-off on the student's Overall Training Log.

Phase Four — Landing

Objective — Flying the traffic pattern receives so much attention because the low level passes are essentially take-offs and landings in all aspects except touching the ground. In this phase the student will actually take the plane off the ground and bring it in to land.



Counterclockwise Traffic Pattern (Left-turn-to-Base)

1. Practice high passes over the runway. These are rectangular patterns aligned with the runway and at a moderate altitude.
2. As proficiency improves, change the throttle setting to become accustomed to flying the pattern at different constant airspeeds, while maintaining altitude as follows:
 - a. Cross the Threshold at moderate to full power, continue across the Crosswind Leg and into the Downwind Leg at this power setting. At midfield on the Downwind Leg, reduce power to 1/2 throttle, and turn the Base Leg, then Final, returning to full power as the Threshold is crossed. Maintain the runway heading.
 - b. When proficiency is demonstrated with the above, The throttle is dropped to idle momentarily when approaching the Threshold, then immediately returned to full power. This is to become comfortable with these throttle changes while flying the pattern. In all cases it is important to maintain control and the proper runway heading.
3. The previous exercises should be repeated with approaches from the opposite direction so the student is not "locked-in" to one type, of approach pattern. If the initial training was from a *Left Turn-to-Base* pattern, repeat the approaches from a *Right Turn-to-Base* pattern.
4. To accomplish a landing, the student just returns to flying a low traffic pattern starting with moderate to full power over the Threshold, reduces the throttle to a comfortable flying speed at the midpoint in the Downwind Leg, and after turning the Base and Final legs, when reaching the field is assured, the throttle is returned to idle. It is important to maintain a "nose-down" attitude at all times during the landing approach, and to "flare," or apply "up" elevator just before touchdown.

Evaluation

When the instructor is satisfied that the student demonstrates that he/she can make a controlled landing in both directions consistently, Phase Five may be signed-off on the student's Overall Training Log, and the student is ready to solo!

Phase Six — Solo Flight

Objective — To demonstrate the proficiency and skill necessary to handle the aircraft alone, and practice the skills learned in the previous five phase of instruction.

1. Readiness for this phase is usually determined by the instructor. Even though a student has completed the previous phases, additional flight time may be needed prior to solo. So each student should be content to obtain more flight time until the instructor indicates it is time to solo.
2. A flight test of three successful take-offs and full stop landings is a good prelude to a solo flight. During these flights the instructor is supervising, but not controlling the aircraft at all, except for some verbal advice.
3. When the instructor is satisfied that a student is ready to solo, he will ask the student to go through a preflight inspection and taxi the plane out alone for solo flight.

Evaluation

When the instructor is satisfied that the student is has successfully demonstrated solo control of the aircraft for at least one, and preferably several solo flights, the solo phase of training may be signed-off , and the student is a qualified RC pilot. But, training should continue to include the final *Emergency Procedures and Flight Techniques* on the next page.

Congratulations! You Made it!

Emergency Procedures and Flight Techniques

Objective — The purpose of this final “Graduate School” if you wish, is to acquaint new pilots with safe procedures to use in emergencies or unexpected flight conditions.

- 1. Out of Trim Flight** — All pilots must trim a plane for flight. Trim will change with a new plane, changes in balance (CG), or sometimes wind conditions. The instructor will deliberately Mis-trim a plane during flight and hand the controls to the student to re-trim. This is done at a safe altitude, and the instructor is available to save the plane if necessary, but the student should be able to hold the proper control input while adjusting the trim to reestablish stability.
- 2. Dead Stick (Emergency) Landing** — To prepare for the engine failure eventuality we all face, it is important to practice “Dead-Stick” landings, or landings with no power and no way to go around for a new approach. In this case, the power failure is simulated by cutting power at some point in a flight, and if the glide slope chosen is incorrect, the pilot may power-up and try again. But this exercise should be taken seriously. *If you don't know how to land correctly with no power, you will be fixing a broken airplane.* This is a good time to practice field etiquette by calling out intentions to make a “Dead-Stick” landing. Since it is practice, however, try to do it with a clear field so others aren't inconvenienced unnecessarily.
- 3. Loops and Rolls** — This is a good time to learn a few techniques from the instructor on the finer points of loops and rolls. They aren't as simple as they look sometimes.
- 4. Cross-Wind landings and Take-offs** — When weather conditions permit, practice some cross-wind control techniques. The instructor can provide some insight on these skills. We don't always have the wind directly down one of our runways so these talents will be needed on some days.

Preflight Orientation Checklist

Objective — At the completion of this Checklist, the student will be able to inspect a model and identify deficiencies that could cause a malfunction or unsafe operation. In addition, the use of the radio, and the field rules should be thoroughly understood. Also, the student should be able to safety start and adjust the aircraft engine and be ready to start hands-on flight training.

- Inspect the aircraft structure and Center of Gravity (C. G.)
- Confirm the presence of the owners name, address, and AMA number on the aircraft.
- Inspect the radio installation.
- Inspect all the linkages and control surfaces, including controls for proper throw, direction and freedom of movement.
- Inspect the engine and fuel system installation. Be certain the propeller nut is secure.
- Instructor demonstrates safe engine startup procedure and adjustment.
- Instructor shows the student how to identify rich and lean engine settings.
- Student starts and adjusts the engine.
- Review the *Field Operational Rules and Courtesies*
- Conduct a Range Check
- Discuss battery charging frequency; checking; life
- Discuss Servos — what a growling servo means.
- Define the pit area, and engine operation in the pits.
- Discuss Taxiing on the field — show correct approaches.
- Discuss the use of the runway, and runway operations.
- Discuss traffic and right of way on the field.
- Discuss Restricted air space — pits and parking lots.

Evaluation

When the instructor is satisfied that the student understands how to preflight a model, and has been briefed on the Field Rules and basic operation, this checklist item may be signed-off on the student's Overall Training Log.

Note: The Preflight Inspection should be reviewed at the start of all flying sessions.

Student's Overall Training Log

Pilot: _____

Phase	Instructor	Date
Preflight Orientation <input type="checkbox"/> Field Rules and Courtesies <input type="checkbox"/> Safety Tips <input type="checkbox"/> Preflight Orientation	The instructor is satisfied that the student understands how to preflight a model, and has been briefed on the Field Rules and basic operation. <input type="checkbox"/> Instructor _____	
Phase One — Control and Flight Fundamentals <input type="checkbox"/> Control Familiarization <input type="checkbox"/> Turns Practice <input type="checkbox"/> Climb and Decent Practice <input type="checkbox"/>	The instructor is satisfied that the student is proficient in these elements of control, when they can be accomplished smoothly and without the intervention of the instructor. <input type="checkbox"/> Instructor _____	
Phase Two — Level Flight, and Patterns <input type="checkbox"/> Straight and Level Flight <input type="checkbox"/> Figure Eight's <input type="checkbox"/> Complete Circles <input type="checkbox"/> Flying Patterns	The instructor is satisfied that the student is proficient in these elements of control, when the student can demonstrate an ability to fly the plane where the instructor asks for it to be flown. <input type="checkbox"/> Instructor _____	
Phase Three — Slow Flight, and Take off <input type="checkbox"/> Stall Fundamentals <input type="checkbox"/> Slow Flight <input type="checkbox"/> Power Off Glides <input type="checkbox"/> Take off	The instructor is satisfied that the student is proficient in recovering from stalls, can fly the aircraft slowly maintaining airspeed just above a stall, and can take off. <input type="checkbox"/> Instructor _____	
Phase Four — Landing <input type="checkbox"/> High Passes In Pattern <input type="checkbox"/> Throttle Changes/Approach Practice <input type="checkbox"/> Both Left and Right Pattern Practice <input type="checkbox"/> Landing	The instructor is satisfied that the student has control of the aircraft during all legs of both counterclockwise and clockwise traffic patterns at both moderate and low altitude approaches, and demonstrates that he/she can make a controlled approach and land consistently. <input type="checkbox"/> Instructor _____	
Solo Flight Completed !	<input type="checkbox"/> Instructor _____	
