



Model Aircraft Pilot Training Program

Revision A

Fort Bend R/C Club

AMA Club No, 615

Founded 1956

P.O. Box 667

Sugar Land, TX 77478

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Introduction

This Pilot Training Program is designed to assist new, as well as more skilled, radio control pilots to become competent, safe, courteous, and knowledgeable in the operation of radio-controlled aircraft.

The program is organized into five learning modules, plus the last section “Don’t stop leaning yet”.

The student should not progress to the first module until they have reviewed and are familiar with the:

- Rules for operations, safety and flying etiquette at the FBRC flying field.
- Layout of the FBRC flying field

The student should not progress to the next module until the previous one is signed off by one of the club certified instructors. Each module may require several visits to the flying field and consist of several flying sessions. At the end of each flying session the instructor should sign, date, and write comments that can be referenced for the next session. It is always best to stay with one instructor. However, the course has been designed to be effective with multiple instructors.

Student Note:

Follow the instructions exactly as printed and as your instructor advises. Do not attempt to skip a module or hurry through one. If you change instructors have them review and discuss the entire course and your previous progress in theory as well as flight before attempting a new lesson. Remember, never solo without your instructor until Module 4 is complete and your instructor is satisfied with your progress and ability to fly unassisted in a safe & courteous manner.

FBRC Field Operational Rules:

All non-member pilots shall have in their possession a current AMA card.

Guest pilots are welcome and can fly once their proficiency is shown and approved by an FBRC club member.

Guest pilots are requested to become a member Fort Bend RC Club after 2 flying sessions per year.

Do not overfly the adjacent commercial and residential properties.

Members are responsible for assuring that guest's conduct is in accordance with club guidelines.

All members shall:

Ensure that all visiting spectators are aware of restricted areas.

Control their pets.

Keep the pit area clear of litter.

All members & guests shall supervise their children to avoid injury, damage to s or equipment and protection from moving vehicles. Children are not allowed on the flight line unless actually flying or receiving instruction.

No intoxicating substances of any kind are allowed at the flying field.

50 MHz (00 – 09), 72 MHz (11 - 60) or 2.4 GHz transmitters may be used.

50 & 72 MHz transmitters shall display frequency ID number.

50 & 72 MHz transmitters shall not be turned on without possession and display of proper frequency control card from the frequency board and without placement of pilot's current club member ID or AMA card on the frequency board. VIOLATORS ARE RESPONSIBLE FOR ANY DAMAGE CAUSED BY FAILURE TO OBSERVE THE FREQUENCY CONTROL PROCEDURES.

Any accident involving personal injury or damage to property other than models shall be reported immediately to a club officer or an executive board member.

Pilots of aircraft cannot declare or make obvious their intention to fly and commence a new flight once a helicopter pilot has declared their intention to fly on the runway in use. Helicopter pilots may fly once all flights with aircraft have ceased. Upon completion of helicopter flights, flights with aircraft can resume.

Helicopters may:

Fly at the west end of the East/West Runway while aircraft are being flown off of the North/South runway. The flight line parallel to the North/South runway serves to separate the flight zones.

Fly at the south end of the North/South Runway while aircraft are being flown off of the East/West runway. The flight line parallel to the East/West runway serves to separate the flight zones.

FBRC Field Safety Rules:

With two or more pilots, spotters are recommended. The duty of the spotter is to make the pilot aware of all flying/ground activity that may have an effect on the pilot, and to relay the pilot's intentions to the other pilots/spotters. All intentions must be called out in advance and acknowledged by the other pilots/spotters.

Ground starting aircraft must be properly restrained and all slack taken up before starting. You must prevent your propwash/jet exhaust from affecting other people/aircraft/property.

Aircraft must be in good mechanical condition and all control surfaces checked for proper operation prior to flight. A range check is MANDATORY prior to maiden flight.

Flying/ground activity shall only be performed beyond the flight line. The close edge of the runway being used defines the flight line between the pilot stations and the zone where flying/ground activity is permitted. For the sake of clarity, the flight line is straight and defines a vertical aircraft extending infinitely upwards, left and right.

Only one runway direction is active at a time and the runway direction in use may not be changed without consent of any pilots currently flying and any pilots who have declared or made obvious their intention to commence a flight.

Dead-stick aircraft have landing priority over all others. Landing aircraft have priority over aircraft taking off.

3D/high alpha type maneuvers:

During such maneuvers pilots may leave their pilot station and cross the flight line only when up to a maximum of two other pilots give their consent and all pilots are performing these maneuvers. All pilots shall return to their pilot stations when any pilot ceases these maneuvers or declares their intention to land.

Due to the close proximity of the runways to club facilities, these maneuvers shall only be performed beyond the far edge of the runway being used.

Low, high-speed passes shall only be performed beyond the far edge of the runway being used.

FBRC Field Flying Etiquette:

First and Foremost, be courteous to others. Observe the type of flying that is taking place at the moment and then join the fun or wait for a break in the action so you can change to your particular style of flying. Also, refrain from making back-to-back flights when others are obviously waiting for you to finish.

Let's all use the same runway. Taking off and/or landing on the runway not designated by the indicator aircraft, located at the intersection of the 2 runways, is very dangerous. No one flying can see what you are doing and if you lose control of your aircraft, you are putting people in harms way unnecessarily.

When taking off to the North or to the West, the general flight pattern is with right hand turns. The landing pattern is also done with right hand turns. If you are having a problem making right hand turns in this situation, please request help from one of the instructors and learn to fly a horizontal figure 8 pattern without gaining or losing altitude. If you can fly that pattern properly, you should have no problem making right turns on landing approach.

Sustained flight towards the pilot stations or flying facilities should be avoided when close. This, of course, can occur briefly during turns or maneuvers.

Learn how to land. If you can't land properly, you can't fly. Remember, takeoff is optional. Landing IS mandatory. Since the beginning of flight, we've never left a aircraft up there. When you fly, shoot several landings, as practice makes perfect.

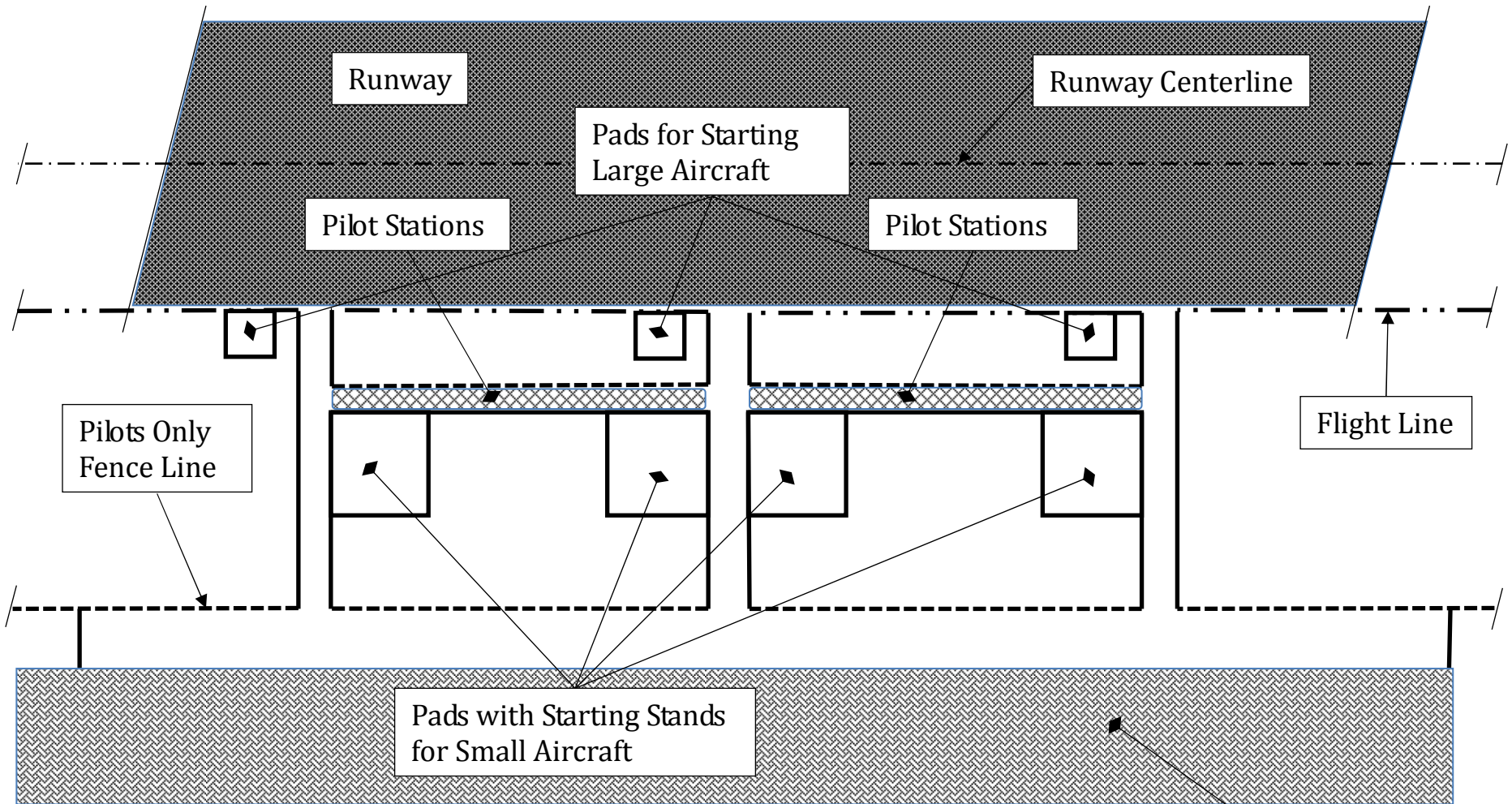
Landing aircraft will always have the right of way. Please check to see if there is a aircraft attempting a landing before you taxi out on to the active runway for a takeoff. Call out your intentions to other pilots who are flying.

The startup stands are for start up and minor engine adjustments. If you must make extensive engine adjustments or break in an engine, please use the stand by the concession building. Do not run engines under the pavilions when there are other people present.

ALL internal combustion engines shall have mufflers.

If you see trash on the ground or tables, pick it up and place it into the trashcans. If you find one of the garbage cans in the pavilion full, take the bag of trash to the dumpster at the west end of the parking lot.

The last CLUB MEMBER to leave is responsible for locking up the buildings and the gates.



North



Parking Lot

FBRC Field & Runway Layout

Module 1 - First in the Workshop

ARE YOU AND YOUR AIRCRAFT READY?

Note: The aircraft should not be flown until a qualified instructor signs this module!

| Category | No. | Check student's aircraft for: | OK (y = yes, n = no) |
|---|-----|--|----------------------|
| Is the aircraft structurally sound? | 1 | Warps and alignment of all surfaces. | |
| | 2 | Wing hold down device. Bolts or rubber bands. | |
| | 3 | Center of gravity (approximately 25-30 % of average wind chord) | |
| | 4 | Secure horns, hinges, clevises (clevises should have some kind of safety locking device) | |
| | 5 | Firewall installation | |
| | 6 | Landing gear, attachment alignment, free rolling. | |
| | 7 | Color, visibility. i.e. the top of the aircraft should contrast sharply with the bottom so the student can better establish reference. | |
| Engine installation and operation? | 1 | Mounting bolts and mount. | |
| | 2 | Propeller/spinner balance. Attaching nut tight. | |
| | 3 | Fuel tank position, fuel line routing – including a nose high wide open throttle check (int. combustion engines) | |
| | 4 | Needle valve setting, idle speed, transition (int. combustion engines) | |
| | 5 | Engine cycles from off to maximum with full throttle range (electric only) | |
| Radio operation? | 1 | Verify frequency flag, number with actual frequency (50 or 72 MHz radio) | |
| | 2 | Antenna routing through airframe | |
| | 3 | Proper foam wrap on battery & receiver and secured | |
| | 4 | Servo mounting, arm screws, clevis to arm. | |
| | 5 | Push rods, attachment to clevis and horns. | |
| | 6 | Control surface directions, deflections. | |
| | 7 | Make certain the servos are not stalling at full deflection. | |
| | 8 | All trims centered when control surfaces are centered. | |
| | 9 | Range check using the manufacturer's suggested procedures. | |
| Category | No. | Check student's understanding & behavior: | OK (y = yes, n = no) |
| General safety, courtesy and frequency control. | 1 | Explain and demonstrate method of frequency control. Pins. | |
| | 2 | Do not direct your propeller blast at any aircraft, person, or ground equipment. | |
| | 3 | Landing aircraft have the right of way of all others. (Intentions to land should be made known to other flyers) | |
| | 4 | Never fly behind the flight line or near spectators. | |
| | 5 | Never stand in line with a rotating propeller. | |
| | 6 | Do not reach over a propeller to adjust an engine. | |
| | 7 | Do not run up engine in the proximity of loose materials. | |

General novice flight instructions:

1. Explain how each control surface affects the aircraft; pitch, roll, yaw. Explain effect of engine. Roll and pitch are the primary controls we will be concerned with in the first lessons.
2. Explain the need and reason for up elevator (back pressure) when banking for turns.
3. Explain learning process to stay oriented with aircraft when it is flying away as well as flying toward you.
 - a. Stick under the low wing concept.
 - b. Pilot in the cockpit concept.

Both concepts are viable learning methods; however, no student should try to learn both.

4. Loss of reference, flying too far away – color perception.
5. Explain what a stall is during power on, power off, and when aircraft is banked as in landing. Explain and demonstrate stall recovery techniques.
6. Instructor should take aircraft up for its trim flight. Land, make necessary adjustments, inspect, refuel/recharge, and if all is OK we are ready for module 2.

See form at end of this document for instructor signoffs and comments for this module.

Module 2 – The First Flight

Practice does not make perfect. Practice and understanding correct principles does.

Most full-sized aircraft pilots, who also fly R/C, agree that it is easier to learn to fly a full-sized aircraft than it is to learn to fly a radio-controlled aircraft.

There are several differences that are to your advantage to understand:

1. Think time!

A pilot flying a full-sized who decides to make a 180-degree turn, if done correctly, will consume two minutes from start to completion. If a pilot of an intermediate R/C trainer, flying at a speed of 60 mph would take the same two minutes, the aircraft will be two miles away and out of sight. 60 mph = 5,280 feet per min. 15 seconds = 1,320 feet. At a quarter mile the R/C trainer is too far away for the beginning pilot to correctly perceive direction. That is one reason a good trainer should be able to fly predictably at 30 mph or less. Even at 30 mph or less, the student has less than 10 seconds to make a 180 degree turn; and then within another 10 seconds must begin the next. Reaction time with an R/C trainer must be three to four times faster than with a 200 mph turbine powered jet. To learn to react correctly with split second timing requires help and practice.

2. Think direction!

When sitting in a full-sized aircraft, right is right and left is left. When flying a model from the ground, right is right and left is left only when the aircraft is flying away from you. When it is flying toward you direction is reversed. To be able to reverse your thinking and project yourself into the cockpit of your model requires time and again practice. Reaction time while learning is again critical.

3. Think location! Think flying speed!

When landing a full-sized aircraft, you watch air-speed, center yourself on the runway, and flair to a good landing. When flying a model from the ground, landing is very different. First you must learn where the runway is while watching your aircraft. To learn depth perception, location of the end of the runway, and how to position your aircraft there is a learned process. Also, in the full-sized aircraft, you can read your air speed. You don't have an airspeed indicator for your model. Stall speed for each aircraft when the wings are level is different. When the aircraft is banked for a landing it is different again. A feel for each aircraft must be developed. Type of aircraft, type of airfoil, wing loading, and size all play a vital role in stall speed. Ask your instructor for a short lesson on stall speed versus aircraft type. Again, familiarity with your aircraft, an understanding of some basic aerodynamics, and proper practice makes what at first seems difficult, easy.

Remember that obtaining a license to fly a full-sized aircraft requires, by law, a specific number of dual-instruction hours with a qualified instructor. You must pass a written examination, and after you have soloed, additional hours and exercises are necessary before you are allowed to take up a passenger. The FAA wants you and your passenger to live. If flying a model R/C aircraft is more difficult than the full-sized variety, put your learning process in perspective. A model R/C aircraft in the hands of a novice pilot can be

lethal. Crashed aircraft are expensive and discouraging. Please make sure you have a “qualified” instructor, an aircraft that is a true “trainer”, and that you learn to fly in a safe and proficient manner. Now let’s get started.

Objective:

1. Proper elevator (back pressure) when banking to complete a turn.
2. Pilot in cockpit (turn body with aircraft) or stick under low wing concept.
3. Keeping wings level when not turning.
4. Maintaining position, altitude, and reference.

Instructor Note:

Demonstrate to the student each concept as they progress to a new step.

1. Take the aircraft off and at a safe altitude allow the student to control and visually feel the aircraft.
 - a. Speed of response of the stick input.
 - b. The need for elevator (back pressure) when turning
 - c. Most students will experience some form of difficulty at this point; losing reference, stalls, etc. Keep the aircraft quite high, flying in large circles. Reverse the direction often.
2. Have the student fly ovals (race track) in front of the flight line. Keep the sides of the oval parallel to the flight line with large turns at each end. Reverse directions frequently.
3. Square off ends of the ovals to fly a rectangle for four separate and distinct headings. Keep wings level when not turning. Reverse directions frequently. Coach as necessary until accomplished.
4. It takes time to develop the skill to stay oriented with the aircraft when it is both flying away as well as flying toward you. Encourage the student to stay calm, and try not to control the aircraft unless reference is known. Patience.

Standards for Passing:

When the student can complete: Flying ovals and square ovals in both directions with confidence and without giving up control to the instructor.

See form at end of this document for instructor signoffs and comments for this module.

Module 3 – Making Progress

Objectives:

1. Fine tune reference skills.
2. Slow speed response of the aircraft.
3. Ground taxi techniques, (tricycle landing gear) rudder and throttle control.
4. Take off procedures.

Instructor Note:

Tell the student what you are going to do, demonstrate, and let the student do it.

1. Have the student fly the previously learned rectangles in both directions. Then fly a horizontal figure eight. Be sure to maintain a consistent altitude and put the center of the figure eight directly in front of the student. Reverse directions frequently. Explain how this exercise develops reference skills as well as spotting the aircraft for eventual landing from both directions.
2. Have the student fly rectangles, but this time change throttle settings and altitude when turning cross wind and then final. Smoothly descend to a progressively lower altitude and then when coming down the runway throttle up and ascend to a new altitude. Repeat until competent.
3. After the student aligns the aircraft for a proper landing, the instructor should land the aircraft. Demonstrate proper and safe technique (taxi in the taxi area to and from the runway).

Taxi the aircraft to the end of the runway and position it on the centerline with the aircraft heading into the wind. Increase the throttle until flying speed is obtained, apply rudder as necessary to counter the effects of engine torque or a cross wind, then with a moderate amount of elevator, rotate, obtaining a takeoff climb angle not to exceed 25 degrees with the ground. Make obtaining the first turn away from the flight line.

Once a safe altitude is obtained, land, have the student realign the aircraft for a proper takeoff and repeat this procedure.

Encourage the student to listen to the engine as the aircraft proceeds down the runway. It is easy to abort the take off when you can hear that the engine is not running properly. Also in case of engine failure, when the aircraft is in a shallow angle of ascent, it is easy to drop the nose and land. A saved aircraft flies again another day.

Standards for Passing:

When the student can complete: Slow speed response, ground taxi techniques, fly rectangles with throttle control – with descent down the runway, and take off with confidence and without giving up control to the instructor.

See form at end of this document for instructor signoffs and comments for this module.

Module 4 – A Solo Flight

Objective:

1. Making a proper landing approach from both directions.
2. Obtaining and controlling a descent rate, keeping the wings level, flaring, and landing the aircraft.
3. Spotting the aircraft on the field.
4. Touch and go procedures.

Caution: No one should attempt this module until they can easily perform modules two and three.

Instructor Note:

1. Have student fine tune the skills to fly the traffic pattern. Reduce the throttle when the aircraft turns cross wind allowing it to start sinking, reduce the throttle more when the aircraft turns final, spot the aircraft on the centerline of the runway, adjust the sink rate with up elevator, then throttle up and go around again. Repeat over and over in both directions.
2. When the student is comfortable, and the aircraft is line up with a proper angle of descent and is centered on the runway, have the student leave the throttle at idle, flair, and land.
3. Touch and go procedures should be explained, demonstrated, and practiced, practiced, and practiced.

Standards for Passing:

When the student can complete: Landing approaches in both directions, land, touch and go procedures with confidence and without giving up control to the instructor.

See form at end of this document for instructor signoffs and comments for this module.

Module 5 – Fun & Practical Maneuvers

Objective: (Your should now be flying an aircraft capable of basic aerobatics)

1. Loop.
2. Immelmann Turn.
3. Split-S Turn.
4. Horizontal Roll

The Loop:

1. The Loop, at first glance, appears simple. Just apply up elevator, wait until the aircraft comes back level, relax the elevator and fly away. However, to get consecutive, nice large round loops, all superimposed on the same imaginary spot in the sky time after time takes for than luck.
 - a. What a loops looks like: The aircraft starts the maneuver flying straight and level into the wind. Then it pulls up into a smooth, round loop. The model stays on heading neither yawing or leaning right or left, both on the upside and downsides of the loop. The speed of the aircraft should remain constant. As the loop is finished, the aircraft should pull out in straight and level flight at the same heading and altitude as it entered the loop and fly off.
 - b. The loop control sequence:
 - i. Fly straight and level at full throttle into the wind.
 - ii. Apply up elevator maintaining a large round loop.
 - iii. As the aircraft toward the top of the loop, ease off of the up elevator some.
 - iv. As you fly over the top, apply some more elevator.
 - v. Throttle down to idle. (It is not necessary to throttle down, however to maintain a around loop, and to keep constant speed it is recommended.)
 - vi. As you approach the bottom, ease off of the up elevator and apply throttle.
2. For the first time, the student probably won't want to be concerned about the throttle changes, elevator changes, rudder corrections, speed, roundness of the loop etc. Simply fly the aircraft straight and level into the wind at full throttle, apply full or almost full up elevator, and watch the aircraft. When it completes the loop, try to fly it out straight and level. When the student is convinced the aircraft will do a loop and they will live through it, start to practice, practice, and practice.

The Immelmann Turn:

1. The Immelmann Turn is easy. All you have to do is one half of a loop. When the aircraft is upside down at the top, apply full right or left aileron for a half roll to right side up, and fly away in the opposite direction. Add some timing to get the right things to happen at the right time and you are there.
 - a. The control sequence:
 - i. Fly straight and level at full throttle.
 - ii. Apply up elevator maintaining a large round loop.
 - iii. As the aircraft flies toward the top of the loop, ease up on the elevator some.

- iv. On top of the loop, when the aircraft is level (some down elevator may be necessary), apply full left or right aileron for a half roll.
 - v. Fly out straight and level at a heading opposite entry.
- b. Possibly the most difficult part of flying the Immelmann Turn is getting the timing right for the half roll. When you come out the half roll, you should be at the same point only higher as you were when you started to apply elevator. You should come out of the half roll in straight and level flight; not in a climb or a dive. This is an easy maneuver to change direction. Practice, practice, and practice.
2. You will find that it is hard to see what is going on up there if the aircraft is so close that it is over your head. Fly the maneuver somewhat out in front of you so that you can easily see when the wings are level.

The Split-S Turn:

1. The Split-S Turn is another maneuver to reverse direction. This is perhaps easier than the Immelmann Turn, because the timing of the ailerons for the half roll is not as critical.
- a. This maneuver looks just like the bottom half of a capital "S".
 - b. The control sequence:
 - i. Fly straight and level, with plenty of altitude.
 - ii. Apply full left or right aileron to get the aircraft to complete a one-half loop.
 - iii. Throttle down and apply elevator to get the aircraft to complete a one-half loop.
 - iv. Ease off of the up elevator as the aircraft approaches straight and level.
 - v. Throttle up for straight and level flight in the opposite direction.
2. Because this is so easy, and so much fun, try experimenting with the roundness of the loop, the speed of the half roll, and throttle control. Practice, practice, and practice.

The Horizontal Roll:

1. So far, we have worked on up-elevator control, throttle control, and perhaps some rudder to keep the tail in line on the up and down sides of the loop. Timing for the half roll with the Immelmann Turn required practice but with the Horizontal Roll, you will be working with aileron control along with a carefully timed sequence of down and up elevator inputs. The word "timed" is key along with an aircraft that is trimmed correctly with the aileron controls set for a good roll rate. The secret is to learn the roll characteristics of your aircraft and practice to develop your ability to get the timing right each and every time; well, almost every time.
- a. Done properly, this maneuver looks like a tight clothesline is drawn through the tail and nose of the aircraft with the aircraft rolling on its axis to the left or right until a complete roll is finished. It can be flown either into the wind or downwind. When flown downwind it allows somewhat more time to get the timing right.
 - b. The control sequence:
 - i. Flying full throttle, straight and level, give full left or right aileron (the aircraft should be trimmed such that the roll takes about one and one-half seconds to complete).

- ii. As the aircraft rolls to the nearly inverted position give some down elevator to keep the aircraft from diving. The down elevator is released as the aircraft rolls out of the inverted position. Remember; timing and practice.
 - iii. As the aircraft continues its roll, the ailerons are released, stopping the roll when level, allowing the aircraft to fly out straight and level at the same heading as the entry.
 - iv. It may require some up elevator as the aircraft rolls right-side up to get the nose up into the original altitude and heading.
2. On your first attempt, don't worry about down and up elevator. Simply raise the nose to about a 30-degree climb, deflect the ailerons eight left or right and watch. Once you find you will live through it, learn to recognize which side is up as it rolls. Also watch how fast it rolls and adjust aileron throws accordingly. Keep you head on and concentrate.
3. Memorize the Horizontal Roll control sequence. Fly at an altitude that allows for a good margin for error. Practice with the aircraft out in front of you. After you can complete one roll, keep the aircraft horizontal and axial and on heading, try two consecutive rolls and then three. Good luck, good timing, and practice, practice, and practice.

As you can see, learning to fly requires knowledge, practice, concentration, and dedication. Have fun and enjoy learning.

Don't Stop Learning Yet

At this point, most pilots stop their learning process. Many don't stay with it this far. Buy some books on flying R/C. Read the magazines. Ask questions for the better flyers. Go to fun-flys and other contests and/or meets. Observe, learn, improve, and have fun.

Some things that are important to practice are:

1. Making right-hand turns and right-hand landing approaches.
 - a. Most right-handed people learn to make left hand turns easier than right-hand turns. Then they quit learning. How can you stay in front of the flight line if you only make left-hand turns? Do you ground yourself when the wind requires a right-hand landing approach, or do you made a 270-degree turn behind the flight line and violate proven safety practices? What will you do if you engine quits in a location requiring a right-hand landing approach? Do you abstain from attending fun-flys because you can't get your aircraft down in a more restricted landing area?
 - b. Performing horizontal figure eights and figure-eight landing approaches will quickly fix your problem. Practice several each time you fly. Practice some touch and goes each time you fly. Can you land on the end of the runway and on the centerline?

2. Flying in winds above 15 mph.

Flying in wind will sharpen you skills and help you become more relaxed. Become accustomed to the wind buffeting your aircraft. It will teach you to put your aircraft where you want it and not where the wind blows it. Don't ground yourself because of a little wind. Go back to basics, practice figure eights, cross-wind landings with the windward wing down and steering down the centerline of the runway with the rudder.

3. Simulate emergency landings.

Have you co-pilot shut your throttle down to an idle at an unexpected time. Develop the judgment and skill to get your aircraft back on the runway safely. Think of the money you will save and the fun you can have doing it. Practice spot landings. Touch down within a 20-foot diameter circle.

4. Learn to fly a tail-dragger.

Real aircraft have round engines and drag their tails. Have you ever heard that comment? Tail draggers are popular and have a special charm all of their own. If this is true, they also seem to have a mind of their own. Instead of tracking straight down the runway, they veer off in one direction or the other. The ground loop easily, are difficult it not impossible to take off in a crosswind, and scare the tar out of many flyers. Why learn to fly these beasts? It's simple. They are fun (isn't that the reason you in this hobby), and if you want to fly scale consider most

pre-1960 aircraft are tail draggers. Talk and learn from your instructor. If you can't find help there, here are some things to think about.

- a. Design characteristics.
 - i. Landing gear too far in front of the CG.
 - ii. Vertical stab too small.
 - iii. Too short coupled.
 - iv. Improper engine thrust.

- b. If you insist on building and flying one of those G Bee type aircraft, here are some hints.
 - i. Reduce elevator travel to an absolute minimum, then do like the real pilots do; hold up elevator during your takeoff run until the last moment. Practice this at slower than takeoff speeds until you get the hang of it. If your aircraft is heavily wing loaded and becomes airborne before you release backpressure, you will need luck to recover.
 - ii. When a tail dragger is properly set up with proper engine thrust, main-gear location, CG, etc., all you have to do is remember to apply right rudder as power is applied. Practice to determine the appropriate amount of power and how fast to apply it as you coordinate rudder.
 - iii. A tail dragger is steered on the ground with the tail wheel because gravity holds the wheel on the ground. On the takeoff roll, the empennage becomes light and begins to lift. Until the speed of the aircraft and its attitude are such that there is enough prop wash and wind force to make the rudder effective, the direction of the aircraft is left to the influence of the engine/propeller effect.
 - iv. The idea is to pass through this engine/propeller effect as quickly as possible. Practice in coordinating engine, rudder, and elevator control is the secret to successful take offs with a tail dragger.

Instructors Notes – Module 3:

| | | |
|-----------------------------------|------------------------|----------------|
| Module 3 Successfully Completed | | |
| Instructor's Name (print legibly) | Instructor's Signature | Date Completed |
| | | |
| Student's Name (print legibly) | Student's Signature | |
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Comments:

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