

2019 Basic Known IMAC Maneuver Instructions

Sequence 1 - 360 Degree Aerobatic turn. This maneuver will look better when flown centered. Right in front of you roll to somewhere between 60 to 90 degrees and start a 360 degree turn, during the turn, add rudder as needed to maintain altitude and it's also important to not increase or decrease the bank angle all the way through the maneuver. As the plane is coming around to the end of 360 degrees, start to roll level. The speed of the roll should be the same as when you first rolled to start the maneuver.

Sequence 2 - Humpty Bump. As you get to the end of the field, pull a gentle radius to a vertical upline. As you establish this line, use your rudder to keep the plane tracking straight up. Remember that you are judged on the TRACK of the airplane and not its ATTITUDE. So you may have to crab into the wind (with rudder) to maintain a nice vertical line. Once you have gained sufficient altitude, pull a nice gentle radius over the top to a vertical downline and reduce your throttle to idle as you come over the top of the half loop. You should now be looking at the bottom of the airplane as it flies straight down. Be careful as you pull across the top of the half loop to keep the wings level as this will make the downline straighter. Once the airplane has flown down a short ways, complete a half roll. Draw another short line, and then execute a gentle pull back to horizontal flight and bring the throttle back up. For best appearance, the lengths of the two lines before and after the half roll should be equal. The airplane should now be headed back towards the center of the field parallel to the runway. As you approach the center of the box, you may notice that the plane has drifted in or out compared to where you started the sequence. You should practice holding the appropriate crab angle through these figures if there is a cross-wind.

Sequence 3- Reverse Half Cuban 8. Begin by increasing the throttle to full power and execute a pull to a 45° up-line. Centered on this line is a half roll from upright to inverted, now flying the same distance before you executed the half roll pull a 5/8 loop to horizontal flight. This again is one of the maneuvers that have been used to reverse direction while preserving altitude and airspeed.

Sequence 4 – Loop. This figure looks easy and is probably the first aerobatic maneuver you flew when learning to fly. It is, however, extremely difficult to fly well. Just before center, begin by increasing the throttle to full power, and start a gentle pull. The size of the loop is not important, but the bigger the loop, the harder it is to make perfect. You need to keep the radius consistent using the elevator and wind correct with rudder if necessary as you execute the first half of the loop. As you come over the top, you may need to keep a fair amount of power as this portion will be flown into the wind. You may even need to apply some down elevator across the top of the loop to keep it round. As the plane starts down the backside of the loop, start to decrease power smoothly to idle and use the elevator to keep the radius consistent. Finally, increase the power as you come back to horizontal flight. The loop should start and stop in the exact same place at the same altitude for the best possible appearance. Ensure that it was round and not some other shape.

Sequence 5 - Sharks Tooth. Fly towards the end of the field, and increase power to full throttle. Execute a gentle pull to a vertical up-line. As before, use the rudder to maintain a nice vertical track. Execute a gentle pull across the top of the figure to an inverted 45-degree down-line coming back towards yourself and decrease the power to idle or close to idle. Hold down elevator to maintain a nice line (not too shallow!) and then complete a half roll to upright. Hold this line and then execute a gentle pull back to horizontal flight and increase the throttle. You will now be flying to the other end before starting the next maneuver so be sure to keep this line level in all respects as it can be quite long.

Sequence 6 - Hammerhead. Begin this figure by applying full throttle and executing a gentle pull to a vertical up-line. Use the rudder to keep the plane tracking straight up. Once you have reached sufficient altitude, begin to decrease the power. Leave 3 or 4 clicks of power on, and just before the plane stops moving, apply full rudder and come back to idle. It is almost always easiest to hammer INTO the wind if there is a crosswind. If the wind is down the runway, hammering either left or right is OK. Once the plane starts to pivot, the throttle can be reduced to idle. One method of preventing the plane from wagging its tail after the pivot is to keep some rudder input after the pivot and slowly take it out as the plane goes down. Though a bit harder to do, another method is to come out of the rudder just as the nose starts to pivot downwards. Also do not let the wings come off level. If your plane is trimmed well and the radio mixes are proper, this is not likely to happen as your mixes will take care of it but at the same time certain mixes can create this problem, it all depends on what aileron you had to mix in with the rudder. Almost all planes need some kind of rudder/ aileron mix. At the bottom of the line, execute a gentle pull to a horizontal exit and increase the throttle. Try to make the entry radius and exit radius equal don't execute a sharp pull at the bottom. You should now be flying back to the center.

Sequence 7 – One Full Roll. Just before you get to center, start an aileron roll. You will not be judged on the rate of the roll – it can be as fast or as slow as you like. Typically, the faster you roll, the harder it is to stop it with the wings level. Give a little down elevator while you are inverted so that you don't lose altitude, and stop the roll with your wings level. For the best appearance do not let the nose come off the line at any time during the roll (pitch or yaw), keep the roll rate exactly the same all the way through the maneuver and stop with the wings level.

Sequence 8 – Half Cuban. Fly straight and level into wind and at point apply full power and up elevator to initiate a climb, as if starting an inside loop. Begin by increasing the throttle to full power and execute a smooth 5/8 inside loop. Again, as you come over the top of this figure, you may need to keep a lot of power as you will be flying into the wind. As you approach the inverted 45 degree line back towards yourself, decrease the power to idle and hold some down elevator to maintain a nice line. Most newcomers make this line too shallow, so concentrate on getting the line correct. After holding the 45 degree line for a bit, execute a half roll to upright and maintain the 45 degree line. Finally, execute a gentle pull to horizontal flight and increase the throttle. You should now be flying back towards the center of the field from left to right parallel to the runway.

Figure 9. Half inside loop Immelman. Starting from straight and level flight at approximately $\frac{3}{4}$ throttle. As the plane passes directly in front of you pull back and hold the elevator as you would to do a loop. When the plane reaches about 4 o'clock put in full throttle. As the plane reaches

the top adjust the elevator to make a nice half loop. When the plane has reached the top of the half loop (the plane should be inverted and going exactly in the opposite direction from which the loop was started) release the elevator to neutral and immediately roll the plane left or right with the proper aileron input. When the plane rolls to the upright position (180 degrees) release the aileron to the neutral position and fly back straight and level.

Figure 10. One and a half turn positive spin. As you approach the center of the field at a high altitude, begin to reduce the throttle smoothly. As the plane slows, you will have to feed in up elevator to keep it from descending. This will gradually bring the nose up. Once the throttle has reached idle, keep feeding in up elevator until the nose drops in a stall. You will also have to be keeping the line straight with rudder – particularly if there is any crosswind and your airspeed decreases. Don't worry if the nose of the plane is cocked 45 degrees before the stall – it is most important to keep the line straight! As the nose drops, feed in rudder in the same direction as the wing that is falling – right rudder if the right wing is falling and left rudder if the left wing is falling. Once the spin begins, go to full rudder and full aileron in the same direction (you should already be at full up elevator). After 1.5 turns, neutralize all controls to stop the spin. If the nose is high, give down elevator to establish a vertical downline. After the downline has been established, execute a gentle pull to horizontal flight and increase the throttle. You should now be flying from right to left parallel to the runway.