The Immelmann Turn
a turnaround maneuver

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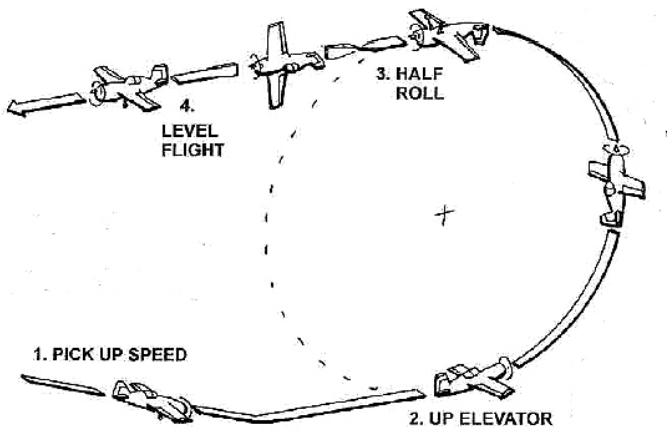
In the very early days of aviation, pilots were happy to be able to get airborne and back down on the ground in one piece alive, let alone do stunts! But little by little, as airframes were built stronger and pilots became more and more proficient, airplanes began to do much more than just fly straight and level.

First used for surveillance during the first world war, aircraft quickly evolved into lethal killing machines. The pilots, locked in life and death struggles, quickly invented new maneuvers and pushed their flying machines to the limit. It was in this atmosphere that Herr Immelmann invented the first Immelmann Turn; this maneuver has borne his name ever since.

This is how you do it: "The model starts the Immelmann flying straight and level, pulls up into a 1/2 loop immediately followed by a 1/2 roll and finishes flying straight and level exactly 180 degrees from the heading at entry", (printed by permission from the AMA Rule Book).

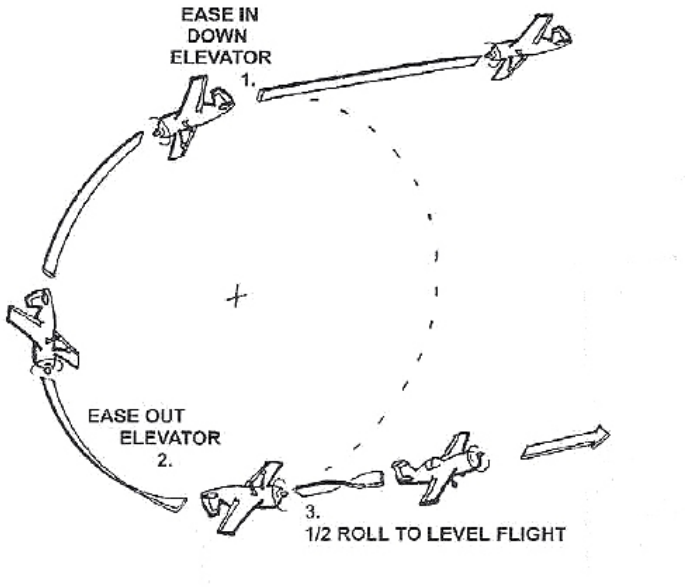
The Immelmann is an easy maneuver for a powered aircraft, but somewhat more difficult for even the most aerobatic sailplanes. The reason is inertia, or energy management. You must point the glider's nose down to got a lot of airspeed, pull up elevator into a half loop and, when you are inverted at the top of the loop, give full ailerons until vou arc straight and level. Voila! There you have it! You've done an Immelmann. The key to this maneuver is getting enough airspeed for the ailerons "to bite" at the top of the loop. You might also need a little down elevator when inverted to keep the nose up.

As you would expect, the Immelmann is a very handy turnaround maneuver. What comes next is much easier for sailplanes (again because of energy management). Let's call it the Reverse Immelmann. Because this maneuver is so much easier, you might want to tackle the Reverse Immelmann first, and then go on to the Immelmann.



The Reverse Immelmann

The Reverse Immelmann is much easier to do than the Immelmann because now you're going down instead of up. The model starts the Reverse Immelmann flying straight and level, pushes down elevator down into a 1/2 outside loop, followed by a 1/2 roll, and finishes exactly 180 degrees from the heading of entry. Obviously, if you plan to try a Reverse Immelmann, you should have enough height for ground clearance.



No problem with energy management here. This is a particularly useful turnaround, because it ends, at the bottom of a 1/2 loop, going fast. You can immediately go for something else which requires airspeed.