



Training: Bob Juncosa

“The Immelmann Turn”

The year is 1914 and air combat is still in its infancy. Max Immelmann, the man that would become Germany’s first “Ace” performs a turning maneuver in a Fokker Eindekker that will eventually bear his name, the Immelmann Turn. In the modern era, the maneuver is a basic one but back then it was revolutionary and considered the best way to reverse one’s flight path quickly so that you could obtain a position on your adversary’s “six”.

As old as this maneuver is, there is still considerable debate on exactly what it is and how it is done. I’ll try to clear up some of the confusion.

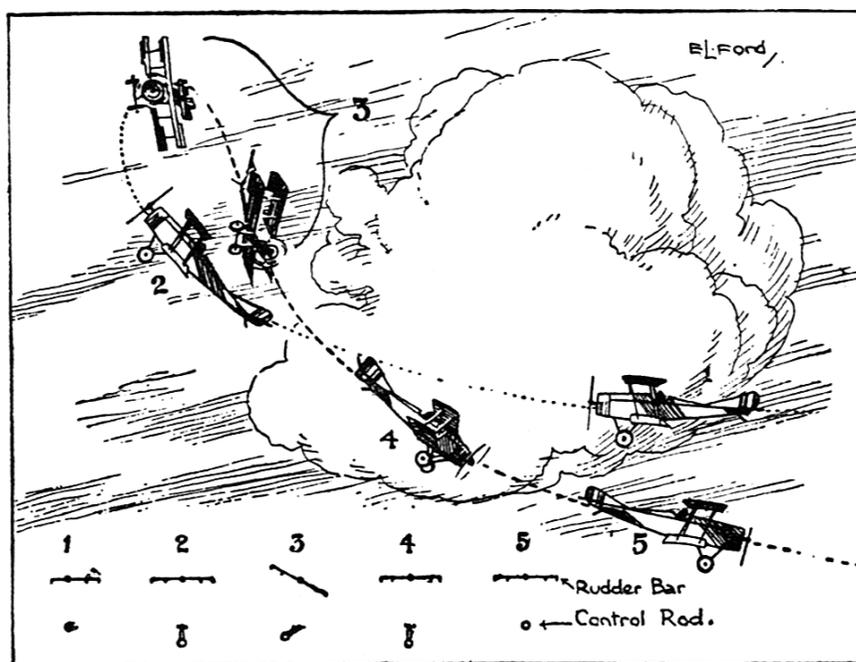
Consider the combat situation where 1) you have just completed strafing a ground target, 2) you have just finished a head on pass with an opponent, or 3) you have just shot past an opponent headed in the opposite heading after attacking his plane from above. In all three cases, you want to reverse your direction as quickly as possible to hopefully regain your advantage and re-engage your enemy. An Immelmann is a way to do just that.

The Classic/Historical Immelmann

As we will see later, there are all sorts of descriptions and opinions as to what an Immelmann is but let’s start with the historic version.

An Immelmann starts with a moderate dive to gain speed. That stored energy is used to put the plane into a steep climb sufficient to reach an altitude either the same as when the engagement was broken off or higher than that of your opponent, now headed in the opposite direction.

Before reaching the stall point, hard rudder is kicked over to quickly reverse your direction. (Left rudder was typically used in order to take advantage of the forces of a rotary engine and spinning propeller.) As your plane reverses its flight path, elevator is used to put your plane in the best position for re-engagement. Check out the figure to the right. It is from 1918 training material.



So, as you can see in the diagram, an Immelmann turn is a *yaw* maneuver.

The Immelmann Debate

Fast forward to present day. Even among the full scale flying community there are all sorts of definitions of what constitutes an Immelmann. My issue with some of these is that they are inconsistent with the intent of the maneuver in the first place. It was conceived as a combat maneuver, not a demonstration maneuver.

These days, an Immelmann is sometime referred to as a “stall turn”. Intentionally stalling a WWI plane is/was never a good idea. Some had very poor or nonexistent stall recovery capabilities. Also, taking the plane to the stall point in a combat situation would waste valuable time and dissipate more energy from the plane than necessary. Remember, the point is to reach the best altitude to re-engage the enemy in the shortest amount of time. Climbing to the stall point just for the sake of the stall does not do that.

Just for the record, if you entered into an Immelmann-like maneuver but took it straight into the vertical, stalled at the top and kicked over hard rudder, that would be a Hammerhead Stall.

Then there is what some call the “Modern Immelmann”. This is where the plane is taken all the way to the top of a half loop and then rolled over from the inverted. In my opinion, rubbish! That is really half of a Cuban 8 where the roll is done at the top of the loop instead of at the 45° portion of down side of the loop. An Immelmann is a yaw maneuver, not a roll maneuver.

I hope you have enjoyed this mix of training and history. Give the Immelmann a try.

Happy Landings

Bob Juncosa

bob.juncosa@gmail.com