



Highlights and Margin Notes in
Wolfgang Langewieshe's

Stick and Rudder: An Explanation of the Art of Flying
Chapter 11 Notes

Perhaps my notes and observations will inspire you to buy your own copy and learn from this classic...or to take the copy you already own off the shelf and revisit its great lessons, just as I am doing again now.

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Continuing my notes on Wolfgang Langewieshe's essential classic, ***Stick and Rudder***.

Part III: The Controls

Chapter 11: "The Rudder"

Page No.	Highlighted Text (Langewiesche's words)	My margin notes
176	Rudder pedals are unnecessary...they serve no very good purpose but can cause much trouble. The airplane...should have no rudder pedals. In all probability it will have no rudder pedals 10 years hence.	Or, perhaps not.
	As long as our airplanes have this control [the rudder], it is most important to the pilot. Fully a third of an elementary course in flying is devoted...to teaching the use of the rudder.	Well, it should be anyway.
	The uses of the rudder...to steer the airplane while taxiing...	
177	The rudder is vital during the takeoff run....	
	In flight, most airplanes need rudder against the "torque"...	Turning tendencies
	...to produce sideslip. Sideslip is useful in maneuvering an airplane to a landing on a predetermined spot.... It permits the pilot to get rid of altitude without picking up speed. But the maneuver is unnecessary in an airplane equipped with a flap, a spoiler, or some other device by which the descent can be steepened without building up excess speed.	Except even with flaps you often need sideslip in a crosswind. L. apparently thought all airplanes will have automatic rudder and landing in a crab, Ercoupe-like.
178	...in crosswind landings...an airplane equipped with tricycle landing gear...can afford to touch with some sideways drift. Hence, this use of the rudder could be dispensed with, too.	Except: side load limitations
	The rudder is very important in a stall.... As long as [the airplane] is stalled it is true that only the rudder will keep its wings level or keep it from turning. Once the airplane is in a spin, it is true that the rudder is an important help in getting it out.	Seems to be refuting his earlier argument that rudder can be eliminated.
	Airplanes can be made unSTALLABLE, and they can very successfully be made unspinnable by restricting the elevator travel and suitably designing the ailerons. And once the stall and spin danger is gone, this use of rudder is no longer essential.	OK, that's it. So, why did this never happen?
182	When you use rudder in the beginning of a turn, you use it not to turn the airplane, not to "help get the turn started"; you use it only to keep the airplane from turning—the wrong way! You use rudder <i>because you are using the ailerons</i> .	Rudder = adverse yaw control
183	The moment [the pilot] has established the bank, he no longer needs any aileron, and thus he lets the stick	Rudder while rolling into and out of the turn, but not during the turn once established.

	come back to neutral. And the moment he does that he rids the airplane of all adverse yaw effects.... Freed of the adverse yaw effect, it suddenly starts to turn willingly.... Now that no adverse yaw effect acts on the airplane, the rudder is no longer needed. Thus, when he neutralizes his ailerons, the pilot must also neutralize his rudder.	
184-185	Every time a gust drops one wing or the other, we level the airplane again by aileron. And, whenever ailerons are used, however slightly, they cause an adverse yaw effect.... Even the slightest hand pressure on the ailerons must be accompanied by foot pressure on the pedals.	Constant coordination
185	The Wrights...hitched their rudder up mechanically with their aileron control. Aileron...would automatically always be accompanied by rudder....	Like a Beech Bonanza's partial interconnect. However, the Wrights only truly solved flight control by uncoupling the automatic rudder and making independent yaw control possible as well.
186	The only real purpose of the rudder is to counteract the adverse yaw effect of the ailerons. Ailerons <i>can</i> be designed that cause practically no adverse yawing effect; hence we ought to be able to do not only without the rudder <i>pedals</i> but actually without the rudder itself.	Yet, we still have rudders
187	Prof. Koppen of MIT has built rudderless safety airplanes which "coordinate" extremely well; and he goes so far as to say this about the rudder: "The only purpose of the rudder is to cover up the mistakes of the designer."	So why do we still have independent rudder control almost 80 years later?

I'll add chapter highlights and notes until we reach the end of the book. If you're impatient—and I hope you are—you won't wait for my musings, but instead will secure your own copy of *Stick and Rudder* now. Beyond simply reading its words, you'll truly analyze, criticize, mark up and understand Langewiesche's teachings to, as Adler suggests, **make this book your own**.

I look forward to your comments on these notes and the larger work. Please send your thoughts to me at mastery.flight.training@cox.net. Thank you.



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