

# Left Seat



**Sport Aviation**

J. Mac McClellan  
LEFT SEAT

Sponsored by **FltPlan.com**

Home About Column Archive Join EAA

← When An Accident Is A Crime

Why New Airplane Prices Are So High →

## Stall Warning

Posted on [January 3, 2013](#) by [Mac](#)

FAA certification rules require that an airplane provide pilots with an unmistakable warning of an impending stall. The warning can be an airframe buffet, or buffeting of the flight controls, but the warning must be totally obvious and must occur enough in advance of the aerodynamic stall that a pilot of normal abilities can avoid the actual stall.



Safe Flight lift detector

This is an almost impossible requirement to meet even though its safety objective is so essential. But thanks to Dr. Leonard Greene every airplane can meet the rule and give pilots enough warning to avoid stalling. You see, Dr. Greene invented the stall warning system near the end of World War II and founded Safe Flight Instrument Corp. to build the equipment so every airplane can warn its pilot in time to avoid stalling.

Although there are several methods to measure angle of attack and thus warn of an impending stall, Safe Flight's most popular system uses that small vane mounted on the leading edge to detect a change in lift. Safe Flight has manufactured hundreds of thousands of the stall warning lift detector systems and they can be found on airplanes all over the world.

I believe Dr. Greene and his stall warning system did more to advance aviation safety than any other single technology. The stall induced accident has decreased in number dramatically in the decades since stall warning became common. There are still some stall related accidents but those usually occur when a pilot loses control in the clouds, or when the airplane simply can't do what the pilot needs it to do such as climb over an obstruction at the end of a short runway.

But experimental amateur-built airplanes have not seen the same decrease in stall accidents. In fact, stall-spin accidents are the single leading cause of fatalities in E-AB. And E-AB have absolutely no requirement for stall warning, either natural buffet, or an artificial warning. Pilots of standard airplanes have benefited greatly from Dr. Greene's invention, but E-AB pilots mostly have not.

While the stall warning system gets most of the credit for general aviation's overall stall accident improvement manufactures have employed other stall taming techniques, too. On many production airplanes cuffs on the leading edge, or vortex generators manage airflow so that the outer wing continues to fly after the wing root has stalled. That maintains aileron effectiveness so wing roll off at the stall is minimized.

Another method used to manage stall behavior is to limit up elevator travel. Without a lot of elevator authority a pilot cannot pull an airplane as rapidly and aggressively into a stall so the maximum angle of attack achieved will be lower and the abruptness of the stall minimized.

And airplane manufacturers make tradeoffs between the lowest drag, highest performing possible airfoil shape in favor of wing sections that behave acceptably when they stall.

The homebuilder, on the other hand, has the freedom to ignore artificial stall warning systems, and to opt for wings and control systems that could never meet certification rules. And that is as it should be. That's why we put "experimental" prominently near the entrance of any E-AB to warn anyone boarding that the behavior of the airplane is unknown, at least not known in the certification sense.

E-AB is all about innovation and the freedom to tryout your own designs, concepts and craftsmanship. But I think innovation is what Dr. Greene did almost 70 years ago. While he was in the Army during the war he witnessed airplanes stalling and crashing and vowed to do something about it. And he did and all of aviation is so much safer for it.

What we need in E-AB is someone like Dr. Greene who has seen enough stall-spin accidents and will do something the help prevent the crashes. Dr. Greene didn't ask for new regulations, and neither am I. Instead he created a technology that addressed the problem and helped prevent countless accidents in all manner of airplanes. Is there among homebuilders another Leonard Greene who can show the way to improve the disastrous stall-spin accident rate? I truly hope so.

This entry was posted in [Mac Clellan's Left Seat Blog](#). Bookmark the [permalink](#).

[← When An Accident Is A Crime](#)

[Why New Airplane Prices Are So High →](#)

 Like 11 people like this. [Sign Up](#) to see what your friends like.

#### Categories

- [Aircraft](#)
- [Airmanship](#)
- [EAA](#)
- [Flying for Fun](#)
- [Industry & Government](#)
- [Mac Clellan's Left Seat Blog](#)
- [Safety](#)
- [Technology](#)