

Invest in the Pilot, Not the Panel

Why the aerobatic community should put Upset Prevention and Recovery Training ahead of panel-mounted AOA indicators in the fight against Loss of Control—Inflight

Those of us who fly aerobatics carry an intimate, working knowledge of angle of attack. We feel where the wing is in the envelope, and we manage it instinctively through elevator input and load factor. That fluency is hard-won, and it is exactly the kind of understanding the broader pilot population is missing. Aerobatic-rated CFIs are, in all likelihood, teaching AOA in ways that are meaningfully more effective than the methods common in primary flight training—and we are doing it without a single dollar spent on hardware.

That gives us both an opportunity and a responsibility. Loss of Control—Inflight (LOC-I) is the leading killer in general aviation, responsible for more fatal accidents than the next several causes combined and accounting for nearly half of all GA fatalities. The single most direct intervention against it is not an instrument. It is training—and our community is uniquely positioned to deliver it. This article is meant to be passed along. Hand it to your hangar neighbors. Pass aerobatics forward.

THE AOA INDICATORS YOU ALREADY OWN

Try this with a pilot who has never flown aerobatics. Ask: Did you know your stall warning horn or light is an angle of attack indicator? Did you know the pre-stall buffet is another one? Are you aware that the position of your stick or yoke is itself an AOA reference? And the question that matters most—have you ever been thoroughly trained on how to respond to a stall warning in a steep banked turn, or in an unusual attitude?

For the overwhelming majority of GA pilots, the honest answer is no. A stall is the result of exceeding the critical angle of attack—not of insufficient airspeed. The critical AOA is an aerodynamic constant for a given airfoil in a given configuration: the wing will stall when that angle is reached, regardless of airspeed, attitude, or power setting. Yet most pilots are trained almost entirely in terms of airspeed and pitch relative to the horizon, neither of which reliably signals proximity to the critical AOA across the full envelope.

Consider a coordinated, level, 60-degree banked turn at maintained airspeed. The load factor is 2G, and the airplane will stall roughly 40 percent above its straight-and-level stall speed. The wing is operating far closer to the critical AOA than the airspeed indicator suggests. A pilot trained to rely on airspeed and pitch alone is poorly equipped to recognize that—let alone recover from it.

So here is the follow-up question our community should make a habit of asking: “Did you know that proper AOA awareness training is available through Upset Prevention and Recovery Training Network providers?” And then the invitation that should follow it: join the network, and provide that training yourself.

THE INVESTMENT IS IN YOU, NOT THE AIRFRAME

UPRT and AOA awareness training are typically available for well below the cost of a panel-mounted AOA indicator (AOAI) installation. More importantly, the money goes into the pilot. That knowledge is transferable—it follows you into every aircraft you ever fly. A hardware AOAI benefits exactly one airplane: the one it is bolted into.

The GAJSC's loss of control working group has stated plainly that a lack of awareness regarding angle of attack has contributed to loss of control and fatal accidents, and that raising pilot awareness of the aerodynamic effects of AOA will help reduce inadvertent loss of control. Read that again: it is a statement about *awareness*. Awareness is built through training, not through hardware.

THE MARKETING PROBLEM

The general aviation industry has been aggressively marketing installed AOA indicators across the entire spectrum. Flip through any general aviation magazine from the past twelve months and count the full-page advertisements for these devices. The FAA's 2014 policy simplified design approval for AOAI installations, and a 2016 expansion under the Non-Required Safety Enhancing Equipment (NORSEE) policy further reduced cost and streamlined installation. Those changes opened the floodgates for a hardware-driven push.

Installed AOAI systems currently run roughly \$3,000 to \$4,500, plus installation and training. That is a substantial capital investment—in your airplane.

The genesis of the push traces back to the General Aviation Joint Steering Committee (GAJSC), a public-private partnership working to improve GA safety through data-driven risk reduction. Its loss of control working group recommended that manufacturers develop cost-effective AOA installations and that owners be encouraged to have them fitted. The recommendation drew broad institutional support, and the publications that followed have reflected—and reinforced—a hardware-first narrative.

To be clear: installed AOA indicators are not a bad thing. They add a layer of awareness on top of the indicators already present in every certificated GA aircraft, and they can alert a pilot to a low-airspeed condition before the stall—genuinely valuable in the takeoff and landing environment. But they are additive, not foundational. The physics of angle of attack have not changed since the Wright brothers first flew in 1903. What changes outcomes is the pilot's understanding of those physics—and no instrument delivers that understanding without training. Tellingly, the training requirement is almost always missing from the marketing. The manufacturers are selling the equipment, not the knowledge of how to use it.

WHERE UPRT SITS ON THE PRIORITY LIST

The GAJSC safety enhancement framework places AOA indicator installation near the very top, as Safety Enhancement items SE-01 and SE-02. The first on-aircraft training enhancement, SE-5 (Transition Training), appears further down, and pilot response to unexpected events sits further still. The ordering reveals a systematic preference for

technological fixes over training—a substitution that rarely produces better outcomes and is seldom more cost-effective.

WHAT YOUR EXISTING INDICATORS ALREADY TELL YOU

Every certificated GA aircraft already carries three functional AOA references: the stall warning system (horn, light, or both); the aerodynamic buffet that precedes the stall; and elevator control position. Airspeed and pitch attitude relative to the horizon are deliberately absent from that list. The wing can be stalled at any airspeed, any attitude, and any power setting—which is precisely why airspeed and pitch make insufficient primary cues for stall avoidance.

A solid working understanding of those three onboard references—developed with a qualified CFI—removes the need for a costly aftermarket installation. Foundational instruction on these cues belongs in every primary curriculum. Advanced work belongs with CFIs who hold demonstrated all-attitude experience in aerobatic aircraft. Budget roughly \$300 to \$500 per hour for in-aircraft instruction. Focused AOA awareness work can usually be covered in about an hour of ground and an hour of flight—call it \$400 to \$600 total. Set that against the price of a panel install, and the case makes itself.

A CALL TO ACTION

Aerobatic-rated CFIs are uniquely positioned to close this gap. Consider building AOA awareness into your existing offerings, right alongside spin training, UPRT, and aerobatic instruction. And to the owners reading this: before you write a check for a panel-mounted indicator, spend a fraction of it on the training that makes *every* airplane you fly safer. The instrument stays with the airframe. The skill stays with you.

If this resonates, join the UPRT Network. [UPRTN.org](https://uprtn.org) exists to promote and positively communicate the benefits of on-aircraft UPRT, to connect pilots with qualified providers, and to advocate for a training-first answer to the LOC-I problem. The aerobatic community has the knowledge, the skill, and the platform to change this conversation. Let's use all three.

SOURCES & FURTHER READING

General Aviation Joint Steering Committee (GAJSC) Safety Enhancements framework (gajsc.org) · FAA Fly Safe LOC-I initiative · FAA Safety Briefing on AOA Awareness · AOPA Air Safety Institute Richard G. McSpadden Report on GA accidents. Full references available upon request.