

Safe Flight's SC-100

by Richard B. Weeghman



The simplest, cheapest angle-of-attack indicator yet manufactured: For \$300, you get a transmitter (bottom), which replaces the stall-warning vane in the leading edge of the wing, and an indicator (top) for mounting in the cockpit.

Yet another approach to the angle-of-attack measuring business comes from the Safe Flight Instrument Corporation. They make practically all the stall-warning indicators aboard light aircraft, so what could be more natural than to calibrate the stall-warning vane and convert it to measure angle of attack? That is exactly what Safe Flight has done.

The result is the SC-100 Speed Control Indicator. It is the essence of simplicity: To install one, simply remove the conventional stall warner and put the SC-100 in its place. What happens in flight is that the sensing vane of the SC-100, which looks for all the world like the stall-warning vane it replaced, transmits to a cockpit indicator an electric signal. This corresponds to the degree to which the vane is moved up and down by the airflow over the leading edge of the wing.

The indicator shows whether you are flying too slow, or too fast, or right at the correct speed (or, rather, angle of attack, which is the critical, unchanging factor in stall computations).

The only shortcoming of the present

design is that it doesn't display certain key angles corresponding to important flight situations. Therefore, the pilot must estimate or interpolate needle positions. So while he can get a "normal" approach by centering the needle on the mark provided, there's no other index to tell him how to fly a short-field approach or a best-single-engine climb with an engine out on a multi-engine aircraft, for example.

He ends up simply gauging the needle position with reference to the letters in the word "slow."

Safe Flight expects, however, to revise the gauge to correct this.

Nevertheless, this is a very small flaw in a low-cost instrument (less than \$300) that offers so much valuable information to the pilot—one that takes into account always-changing conditions like aircraft load, flap configuration, G load and air density in a way that no air-speed indicator can match. And for another \$50 or so, a heated mounting plate will be offered to eliminate the icing problem.

There's only one catch. At the moment,

the angle-of-attack indicator is certificated for only a limited number of aircraft, such as the Mooney Executive, Beechcraft King Air and 99, and the Twin Comanche. Therefore, Safe Flight is pegging its hopes on getting the manufacturers to help with certification, rather than undertaking to go through the process independently.

That's not all that's coming out of Safe Flight, though. For the ultimate in angle of attacking, the company offers SCAT (Speed Command of Attitude and Thrust). This is an altogether fancier piece of equipment than the SC-100, because it does more than just monitor angle of attack; it also keeps tab of power setting, landing-gear position and flap setting by means of vertical gyro, accelerometer, flap transmitter, throttle and gear-oleo hookups.

It provides the pilot with both a slow-fast cockpit indicator like the SC-100's and a separate flight director command that gives him all sorts of valuable information at critical times. Thus it automatically tells the pilot what his pitch attitude should be for takeoff, climbout, approach and go-around phases—no matter what the load aboard, flap setting or engine-out situation.

Furthermore, the whole system can be hooked up with an automatic throttle system. With this, the pilot changes pitch by moving the control wheel forward or back, and the SCAT figures whether he needs more power or less, and gives it to him.

We sampled SCAT Autopower on Safe Flight's Twin Bonanza and found throttle response smooth and effortless, and nicely coordinated to the pilot's change of pitch. Thus, if the aircraft is too high on approach, you need only ease forward on the control wheel, and the throttles automatically ease off. Similarly, pull up on a go-around, following the flight director's command bug, and the throttles add as much juice as you need, hands off.

What all of this means is that the pilot may react much more quickly and effortlessly to the demands of an approach or a go-around or an engine-out, by referring to instruments that give correct information without lag, and keeping both hands on the control wheel. The price of such luxury? About \$25,000 for SCAT with Autopower.

For endorsements, SCAT, with and without Autopower, is either installed on or ordered for numerous airliners, certified for Category II on many of the big jets, is helping the McDonnell Douglas Model 188 (Breguet 941) of Eastern Airlines in its STOL operations, and is being certificated on that zenith of bizjets, the Grumman Gulfstream II. □