Homebuilt Lift Reserve Indicator

by Jim Smith

I first became interested in an Angle of Attack (AoA) or Lift Reserve Indicator (LRI) in 2009 after seeing an article in Contact Magazine about a home grown LRI. I copied the article, but didn't go any further because it required machining a mast that goes under the wing.

At AirVenture last summer my interest was renewed after seeing a nice commercial unit. The vendor produces both an LED unit and a Gage type. After some research I found several more sources, but the prices ranged from $825 to $1,600 for the LED displays and from $450 to $700 for the gage type. Too much for my budget!

A friend of mine has a n RV-6 with a Dynon display which has a AOA display but also required a under the wing mast. He saw an alternative way to accomplish this on a RV web site. When I saw his method I said "That's a great idea".

I ordered a 2inch water column gage, bought 10 ft. of poly tubing and a plastic Tee (it goes in the existing Pitot line). Total system cost $55.74. The gage requires the Red, Yellow and Green markings to be added.

The way the system works is to adjust the angle of the tube under the Pitot tube so that the needle of the gage just touches the Red range at the stall break. A wing will stall at the same AoA regardless of weight, but the airspeed will be higher as the plane is stalled at heavier weights. This is the utility of an AoA indicator since the plane can be safely flown above stall speed regardless of density altitude and aircraft loading.


N2958S
ALT.
HOLD
ON
OFF
ALT
FUEL PRESS
PSI
Lift Reserve
Indicator
ALT OUT
MASTER
ON
ALT FLD
BATTERY
OFF
AIRSPEED
TRUE SPEED
KNOTS
M.P.H.
TEMP
FEET
DIGITIZER
AMERI-
KING
CORP.
ON
RESET
LIGHTSPEED