HOW-TO-DO-IT

THE DELTA AIRSPEED ANTICIPATOR

by STEPHEN DU PONT

One of the more exciting stories of soaring was Bob Pfeiff's about a flight to 20,000 feet in Florida with nothing but his shorts, T-shirt and tennis shoes. The author also mentioned a liquid pitch indicator as an airspeed holding aid, and of course his 1-26.

Some discussion was heard on local fronts about the use of pitch indicators in airplanes and some were reminded of a cat who was rumored to be hanging by its claws vertically upwards from Alcock & Brown's windscreen, thereby saving the Vicars from an inverted dive into the sea and ensuring the first successful transatlantic flight in 1919.

I purchased my liquid level indicator, no doubt, just like that used in a Vicars Vimy, as Pfeiff advised but couldn't find space to install it, so it resides in that cupboard of things too nice to dispose of, but for which I have no use.

But I've been thinking again, after thumbing the pages of older *Soaring* magazines and believe Pfeiff had a point some of us might heed. Consider a vertical dive in a sailplane. Gravity is trying to make you accelerate 32.4 feet per second each second, or let us say to increase the airspeed 22 miles per hour each second along the flight path, in this case straight down. Now let's level out until we are gliding at say a constant 50 mph, and suddenly drop the nose to increase our descent by a glide angle of only one in ten more than that for 50 mph. We are increasing suddenly the force to propell the sailplane by 1/10 the force due to gravity, or such as to try to make our speed increase 1/10 of 22 mph each second, or 2.2 mph per second.

If this happens by accident when you are working with the radio or the map, or glued to the variometer, you won't know it until you hear the airspeed actually increasing seconds later. A glance at the airspeed after the first wrong second only shows an imperceptible needle motion, if any at all. But if you knew the nose was down 3½° you could smack it up again and never be the worse for it. Since gyro instruments are forbidden, how you gonna know?

Pfeiff's liquid pitch level will tell you, but again it may be too insensitive if it has 5-degree graduations on it like the one I got. So, I have made one as follows:

A hardware store line level that happens to read a 1 in 16 slope at one bubble width displacement cost 50 cents. One in 16 slope can predict 22/16=1.38 mph airspeed change each second. The bubble is easily readible to ½ width or to about .7 mph per second airspeed change.

I mount the bubble tube, after extracting it from the part that costs the 50 cents, in a wire cradle by the use of epoxy glue. Then mount it so it can be tilted for adjustment in a simple metal frame so as to be viewed from behind in a small, 45° mirror, also mounted in the frame, and glue this expensive assembly to the top of the panel with contact cement. I paint appropriate parts dull black so FAA will think I bought it.

The tube appears vertical as seen in the mirror, with the bubble, properly adjusted by tilting, so as to be between the hairlines, ½ way up in the tube.

Just fly the hair lines to the bubble with the elevator to hold airspeed. In a 45° bank the device becomes more sensitive; you adjust the bubble by tilting the cradle to the midpoint when in the thermal bank and at the chosen airspeed, say 45 mph at a 45° bank. Then fly the hairlines always to the bubble. Centering in the thermal would be by rolling in or out with the ailerons, and the speed control by the bubble with elevator control. The bubble is nervous and it needs damping, but you can live with it the way it is.

I spoke of this to Dick Schreder and he advised he had no room on his panel for any more things, and that he can tell all about it by the sound.

Well, since my hearing aid fell in

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The Delta Airspeed Anticipator (Nervous Model).