AIRSPEED!
By Richard Carlson SSF Chairman

I tell all my students that I'm a big fan of the clipboard instruction technique. That's the method where when they do something wrong I whack them on the back of the head with a clipboard.

Now I don't really physically strike anyone, but in thinking about how I teach and the elements that are important, I probably do verbally strike them sometimes and it's most often in the pattern or when operating close to the ground. The noun that I hit them with most often is **AIRSPEED!**

We all know that an aircraft stalls when the angle of attack (AOA) exceeds the critical angle of attack. We also all realize that the AOA is defined as the angle between the cord line of the wing and the relative wind. The critical AOA is a design limit of the airfoil and is determined by the manufacture. While the pilot has direct control over the AOA with the elevator, gusts and turbulence can cause rapid and unpredictable changes in AOA. Finally, the AOA changes over the wing span, manufactures design wings to have a higher AOA at the root than at the tip to make the stall characteristics more benign.

Monitoring your gliders AOA and keeping it below critical AOA would ensure that the glider isn't stalled, but there are no AOA indicators in gliders. The instrument that we use instead is the Air Speed Indicator (ASI).

Every aircraft manufacture publishes an Aircraft Flight Manual (AFM) or Pilot Operating Handbook (POH) that describes the important design limitations. You will always find a table with various airspeeds for Stall (V_{SO}), Maneuvering (V_A), Max Aerotow (V_T), Never Exceed (V_{NE}) and if applicable Landing Gear operating (V_{LO}), and Flap operating (V_{FE}). Other speeds may also be listed and for 2-place gliders you will typically see numbers for solo and dual operations because some airpseeds vary by weight.

Knowing these speeds is a requirement for solo and should be reviewed on a regular basis for the gliders you routinely fly.

Notice that the approach to landing airspeed is not mentioned in the above list. Most modern gliders certified by the European Union (CAS-22) will have a yellow triangle showing the **minimum** recommended approach speed with no wind. Here in the US the Soaring Safety Foundation has long recommended that the pilot calculate an approach speed using the formula 1.5 x V_{SO} + ½ steady wind and all the gust. For example landing an ASK 21 with the wind reported as 10G15 kts, this would be ((1.5 x 33) + (0.5 x 10) + 5) = 60 kts. [*The original paper incorrectly said 65 kts]*

Now what does all this have to do with my verbal clipboard? Well, once we have determined this speed, it is important to **establish** at the proper time and **maintain it** throughout the rest of the landing approach.

The next question becomes, when should be establish this approach speed? Note that once established we're going to maintain it until we flare!

In a normal landing, the SSF recommends establishing the approach speed when you enter the pattern. That's the 2nd 'S' item on the USSTALL landing checklist. However, the SSF recommends that pilots

use a “Goal Orientated Approach”[1] strategy and this means you don't follow a rigid set of rules when landing. It means you should be flexible and make changes as necessary to suit the current conditions. This may mean flying downwind at a faster or lower airspeed depending on situation (e.g. , slowing down to best L/D when following another glider in the pattern). In any case, the glider should be at the predetermined approach speed no later than on Base leg and this **AIRSPEED!** should continue all the way to the flare.

My verbal **AIRSPEED!** whacking starts once the student/pilot establishes the approach speed. We determined this speed on the ground before the flight started, so unless conditions have changed substantially, we both know what that speed should be. While some variation is inevitable, I want changes kept to a minimum. How much is too much? A variation of +/- 5 Kts is specified in the Practical Test Standard (PTS), but watching the trend is easier to do and when I see a trend starting you get an **AIRSPEED!** whack from me.

If you want to avoid this verbal **AIRSPEED!** whack, then you need to watch the gliders pitch attitude and **monitor** the ASI. Staring at the ASI and trying to fly a constant speed is guaranteed to get you a whack from me. Staring at the ASI will cause numerous and continuous variations in the airspeed, as the instrument lag is too large for the pilot to manage. Instead you need to watch the pitch attitude and if the nose is moving up, the airspeed is dropping and you get an **AIRSPEED!** whack.

As an instructor sitting in the back seat I have a great view of the gliders pitch attitude and can notice changes almost immediately. I then glance at the ASI and see what the trend is. Getting the student/pilot to recognizing those pitch changes is what I'm trying to teach and I'm driving it home with the **AIRSPEED!** whack.

This same **AIRSPEED!** whack occurs during rope break practice as well. The SSF recommends that the immediate action for the pilot to make in a rope break is to pitch to a flight attitude that will drive the AIRSPEED toward the predetermined approach speed, and then turn as necessary to land where you had previously stated you would when you reviewed your launch emergency plan 30 seconds ago, just before this launch started.

Flying too slowly close to the ground has proven hazardous to numerous pilots. Remember my verbal clipboard whack **AIRSPEED!** when operating close to the ground and you can reduce the odds of you being one of those statistics.

1 See SSF 2013 Annual Report for more details http://www.soaringsafety.org/accidentprev/SSF_2013_annual_report.pdf