FOUNDATIONS OF FLIGHT
DESCENT VS. SINK

AXIS Flight School®

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The previous installment covered the differences in a canopy's horizontal speeds, specifically forward speed and ground speed, and discussed how a jumper can control these factors to navigate to a target more effectively. This installment covers the system's vertical speeds, differentiating between descent rate and sink rate, which for the purpose of this article, represents two separate concepts.

Descent Rate—*The vertical component of the velocity at which a parachute travels through the atmosphere.* A pilot controls descent rate directly with inputs and maneuvers, which alters the wing's shape, angle of attack or both. For example, when sharply applying brakes during an aggressive flare, a canopy pilot can generate enough lift to momentarily climb a few feet.

Sink Rate—*The vertical velocity a skydiver travels toward the ground.* The atmosphere a canopy flies through is not stagnant. Just as surface winds affect ground speed, air can have vertical velocity as it rises and falls due to sunlight warming the surface of the earth. If a canopy pilot is in a rising parcel of air such as a thermal, the parachute will maintain its descent rate, but the sink rate will slow. For example, if the rising air moves up at the same velocity as the canopy is descending through it, then the system will remain on a level flight path (parallel with the ground) maintaining altitude until departing that upward current of air.

Application (Sink rate = Descent rate ± vertical velocity of the atmosphere)

Visually assessing ground speed is much easier than assessing sink rate. Therefore, it is important to reference your altimeter to double check whether you are reaching your pattern checkpoint locations at the appropriate altitudes. Changes in sink rate are most common in places with thermic activity such as desert environments. When transitioning into rising air, the canopy pitches slightly nose-up as it momentarily affects the angle of attack. A jumper should keep the parachute flying fast (hands up) when entering a thermal, as the change in angle of attack puts the system closer to a stall.

When exiting a thermal or entering a falling column of air, the system's sink rate increases. To maintain control, some brake input can keep the wing overhead and prevent any unwanted surging when the nose pitches slightly downward. For safety and to remain on target, react to the changes in environmental factors that you feel in the harness accordingly.

This is important to note, especially when you are navigating your landing pattern. If you are caught in rising air, you will lose altitude at a slower rate, which can interfere with your checkpoint altitudes in the pattern. A common result is a pilot overshooting their target. The most powerful tool at your disposal is controlling your relative position to the target while on your base leg. If you have excess altitude, you can bow out the base leg to increase its length, giving you extra time to lose more altitude. This is a much better option than doing S-turns on final into a busy landing area.

We take a closer look at glide in the next installment.

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