On 15 Sep 2015, at 19:10, William Trubridge <will@verticalblue.net> wrote:

The topic overlaps a little with hydrodynamics, which is already covered in AIDA material – I will only talk about how to trajectory corrections

Johnny actually pointed out to me how we correct sagittal deviations, so he might have something to add on the explanation.

There was more to explain than I expected, but feel free to edit of course.

Cheers, William.

**FREEFALL STEERING**

*There are two planes in which the body can deviate from a perfect vertical freefall in the descent: the sagittal plane and the frontal or 'coronal' plane.*

**1. Sagittal Deviations**

The sagittal plane separates the left and right sides of your body.  So a deviation on this plane means you are either 'tipping forwards,' into the line or 'leaning back' away from the line. Sagittal deviations can be caused by having too much weight on the front or back of the body, or by not keeping the legs straight and relaxed.  Remember that the top half of the body is generally more buoyant than the bottom, so when we are upside down this presents problems in the freefall.  It would be like having an arrow with weighted feathers.  This is why if we are using weight it will benefit the freefall to have that weight positioned as close to the head as possible, e.g. around the neck.

Since the head leads the freefall, tipping forwards will mean you will eventually start to brush against the descent line itself, while leaning back will mean you will become distanced from it, and your lanyard will become taut and exert drag on the line.

In both cases a correction can be made by moving the head and neck forwards or backwards.  Since it is the leading edge, it determines flow over the rest of the body, and thus steers movement forwards or backwards. Note that the head should not be hyperextended in these corrections - the gaze stays on the rope in front of you while the whole head and neck move dorsally or ventrally.

**2. Frontal Deviations**

The frontal/coronal plane separates the front and back of your body.  So a deviation on this plane will mean that you are falling a little more to one side or the other.  These are most commonly caused by an imbalance of weighting, for example if there is a heavier weight on one side of your weightbelt, or if one side of the body is in greater tension, for example if you are letting the rope pass through the fingers of one hand in the freefall. If you notice that you are routinely falling more to one side then try and isolate the cause of this and correct that imbalance rather than accommodate it with corrections to trajectory.

It is easy to notice when you are falling more to the left or right side, as the rope will start to move into the left or right field of vision.  It is important to correct these deviations before they become significant - otherwise you will have to break streamline in order to correct the freefall or try and find the rope again.

When freefalling in CNF and FIM the feet can be used to correct frontal deviations, in a similar way to the tail rudder of an airplane.  Externally rotating one foot slightly will create a little more drag on that side which will mean that side of the body will travel more slowly and the body will turn in that direction.  So to move towards your right you would externally rotate the right foot just a little bit.

When freefalling in CWT, frontal deviations are more uncommon, as the bi-fins or monofin act the same way that feathers work on an arrow, keeping the body in line.  With bi-fins corrections can be made in a similar way to FIM and CNF, by creating a small amount of drag on one side of the body. When diving with the monofin, increasing the length of one leg (straightening it out a little bit more) will cause a movement towards the opposite side.

**3. Corkscrew effect...**

Should we mention this?  It is pretty rare, and difficult to explain..