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Ridge Soaring a Paraglider in Light Wind Conditions

Staying aloft in light wind conditions is commonly called scratching. It is called this because experienced pilots fly very close (almost scratching) the ridge in order to maintain altitude or stay up. One of the keys to maximizing your chances of success on such a day is proper speed control.

On light days, it takes more than flying at Minimum Sink to maximize the chances of getting up. “What?” you say, “Min sink is the speed at which you get your slowest descent rate, so how can this be true?” In a nutshell, on light days, the variance of wind speeds and lift at different sections of a cliff vary, making constant (speed to fly) adjustments the best way to stay up. This article addresses ridge soaring in dynamic lift only, not thermal flying. In thermal flights, flying too close to terrain is extremely dangerous and should be avoided. *(Disclaimer: This article is intended for pilots with experience in Ridge Flying. Whenever one is close to a ridge, having enough speed to manage direction and control are always more important than staying up!)*

Speed to Fly is the cornerstone of soaring and maximizing your glide slope and sink rate. If the wind is a perfect 90° to the hill, and the cliff or ridge is shaped without any variance and an unwavering 10 mph, then flying at Min Sink will be the best way to get up. But, in most cases, the ridge and wind are not perfectly set at 90 degrees and perfectly steady wind.

[Speed to Fly](#) is the basis for maximizing glide with respect to wind and lift. Speed to fly is a whole article in and of itself, so I will just summarize for those not familiar. There are many methods that pilots use to combine lift/sink and wind direction, but the following are the basics.

- **Fly Faster into a headwind to maximize glide.**
- **Fly Slower with a tailwind to maximize glide.**
- **Fly Slower in Lift.**
- **Fly Faster in Sink.**

These are general rules that help pilots learn how to maximize their glides. In the “real world” you have to learn how to combine conditions and use these rules to maximize your glide and speed to fly for all of the different conditions that are out there.

In Ridge Soaring, the feeling and concern about maximizing glide are not as strongly perceived and instead we tend to focus on sink rate.

The following is the first rule that applies to gaining altitude anytime on a ridge:

- **Any time that the wind and lift allows you to climb at any speed or maintain your altitude at Min. Sink, you should fly at Min. Sink.** To maintain your altitude or gain as much as you can while in lift, **your fastest climb is always Min. Sink.**

So, what remains are the times when you are not climbing.

- If you are soaring and run into a section where the lift diminishes so that **at Min. Sink you are descending**, you should fly the best “Speed to Fly” for those conditions. *For attaining best glide relative to conditions, “Speed to Fly” is never slower than Min. Sink Speed, so when you are not able to maintain or stay up, you will always fly faster than Min. Sink..*

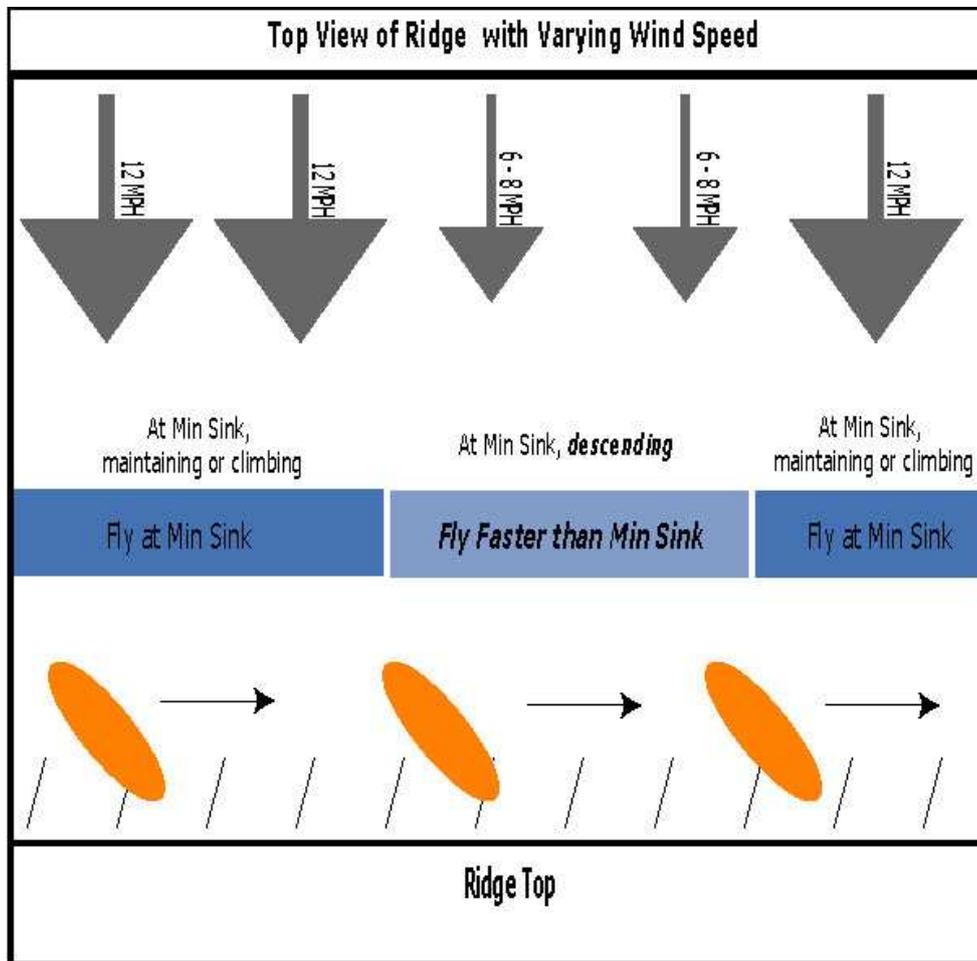
Example (Wind Variance)

The perfectly west facing ridge is about 100 ft. high and the wind is straight in. The wind is blowing between 7 and 13 mph with an average of 10 mph. 10 mph is the threshold speed for you to stay up in

your glider (If the wind drops to 8, you will descend slowly). By flying at Minimum Sink constantly, you will descend at the slowest rate, no matter what velocity the air is at. But, if you fly through a "sink" section where the cycle is at the low end (7 mph), you would descend more over the same distance at minimum sink speed than at a higher speed.

The real benefit of speeding up in lighter cycles is twofold.

- First is the speed to fly factor. If the lighter wind section was spaced over a specific distance (say 100 ft), you would arrive at the end of that section higher by flying the best "Speed to Fly" speed rather than using the constant of Min. Sink speed.
- Second is that when you get to the end of the lighter cycle and back to section where the wind picks back up to over 10 again, the extra speed that you had by flying faster will convert its energy back to extra lift when you slow back down to Min. Sink upon entering the stronger lift.



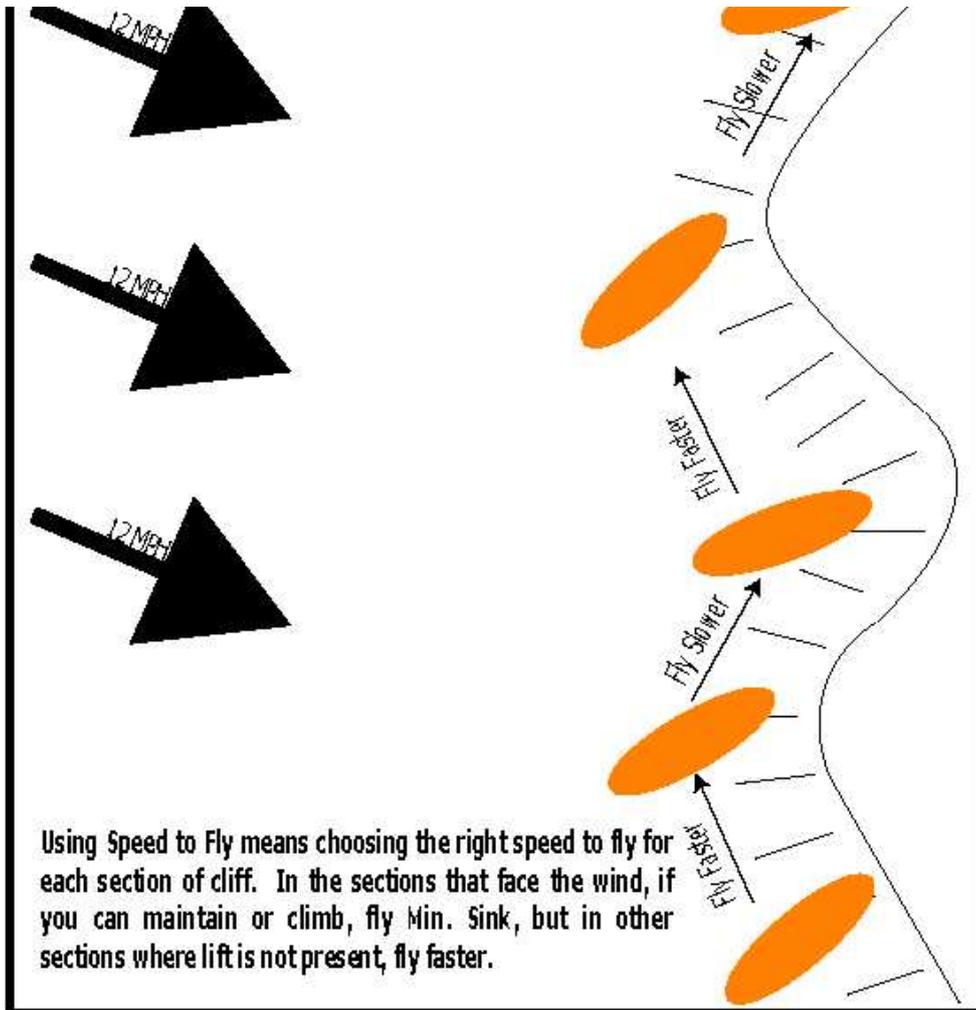
If you fully understand the concepts of "Speed to Fly", then each time the wind drops below the minimum soaring threshold, you will be able to adjust correctly. You can simplify this to the following to better learn this concept.

The larger the drop in wind speed, the faster you should fly. If in the above example it drops to 7 mph, you would likely be flying just slower than trim. If in the above example the wind drops to 9, flying just a hair faster than Min. Sink would be best.

Example (Ridge with Variable Face)

The imperfect ridge faces generally west, but has some ZigZag / Saw tooth sections. The wind is blowing a stead 12 mph. The wind is from the West/Northwest on this day, so that some of the sections of cliff face the wind, while others do not.





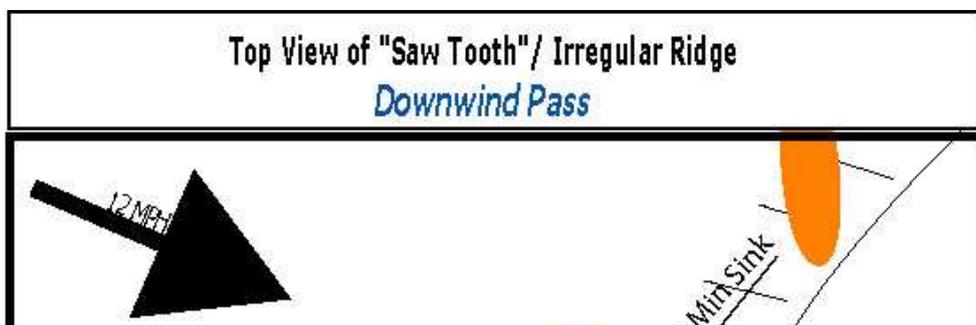
I believe that with this example it is even easier to see how this works. The faces of cliff which face the wind at closest to 90 degrees will produce the best lift. Experimentally, you will sense any time you are sustaining altitude or climbing. In any situation where you can maintain your altitude or climb, flying Min. Sink will keep you up. So as stated earlier, the first rule is it...

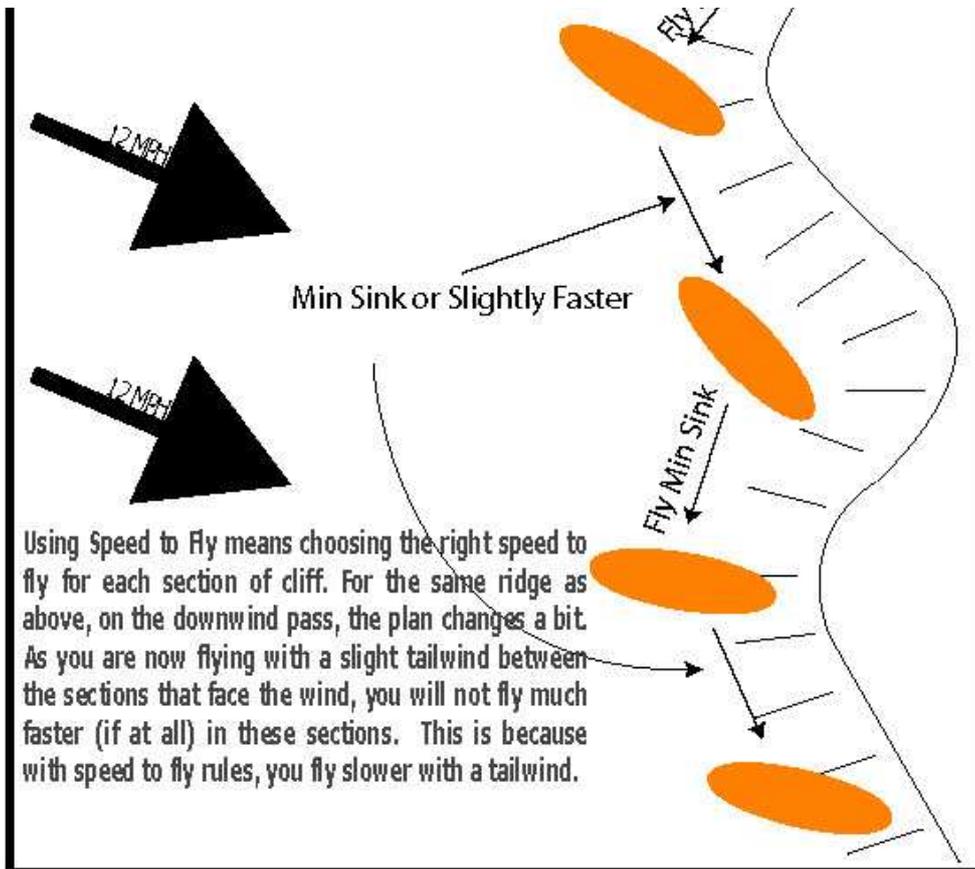
- **Any time that the wind and lift allows you to climb at any speed or maintain your altitude at Min. Sink, you should fly at Min. Sink.** To maintain your altitude or gain as much as you can while in lift, **your fastest climb is always Min. Sink.**

If there is a section where the cliff juts out into the wind and is perhaps at a 60 degree angle to the wind, you will not see lift at this section. Instead, you will be flying more into a headwind as you fly out from the ridge and more in a tailwind as you fly back to the ridge from the upwind end of this section.

If you are flying upwind on such a section, your "Speed to Fly" will be faster than Min. Sink. Continuing to fly Min. Sink in such a section would eat up your altitude. Consequently, if you are flying back downwind from such a protruding section, you will have a relative tailwind, so flying generally slower will work. Again, the same second rule applies to any situation where you cannot maintain altitude by flying Min. Sink.

Things Change a bit when you are on the downwind pass on the same ridge.





Speed to Fly is much more apparent while flying at Thermal Sites. The reason I wrote this article is that the nature of Ridge Soaring tends to remove the connection to ‘Speed to Fly’ and some pilots miss the fact that ‘Speed to Fly’ is also very useful for use in Ridge Soaring on light days.

Up is Good,

Jeff Greenbaum 10-20-04