

# Performance Flying



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## Introduction

This document has been written to assist pilots to get the most out of their existing wingsuit.

The advice on body position is applicable to all suits designed by Robert Pecnik, although many sections are relevant to all wingsuit designs.

This document gives general tips on how to improve your flight performance in terms of distance and freefall time. Time and distance will be treated as two separate flight modes, to focus on time usually sacrifices the horizontal distance achieved and vice versa, as shown in figure 1.

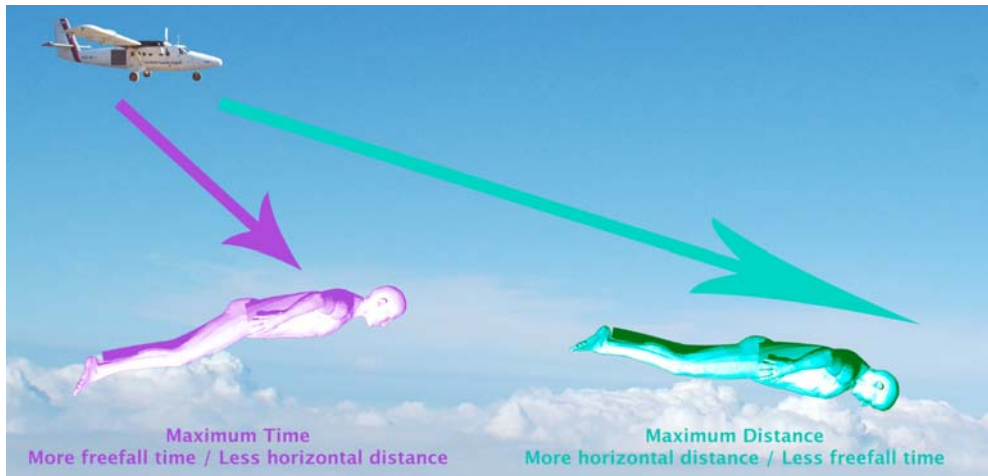


Figure 1: Maximum time VS maximum distance

To fly a wingsuit at close to maximum performance for prolonged periods over multiple skydives during the same day is physically demanding. Dedicated physical training to improve your overall body strength and fitness level will enhance your stamina and comfort.

## Flight Mode A: Maximum distance or Maximum glide ratio

The best way to measure the performance of an unpowered aircraft is the glide ratio it can achieve i.e. how efficiently it trades vertical altitude for horizontal distance (as shown in figure 2). When you maximize your glide ratio you sacrifice a little bit of freefall time but cover much more horizontal distance.

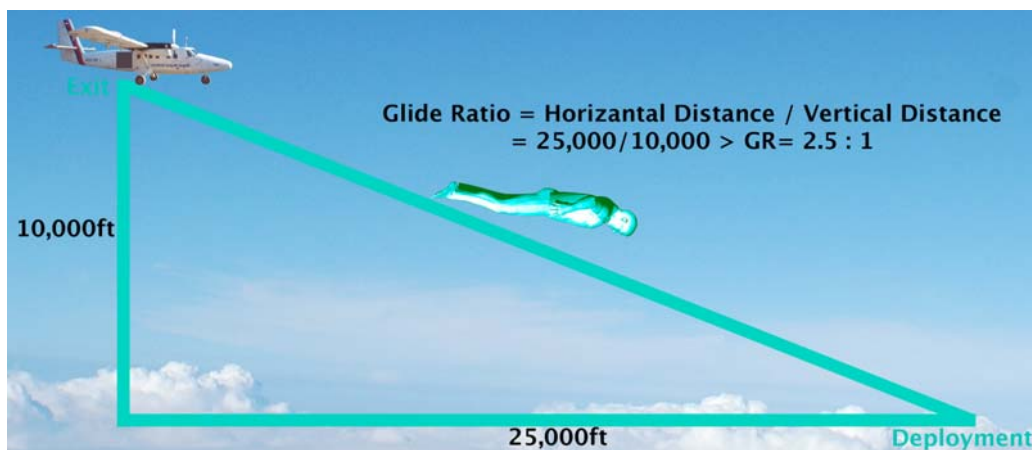


Figure 2: Calculating glide ratio

To fly for maximum distance you will need to fly the wingsuit slightly head low compared to the horizon. Keep your wings completely open but do not stretch the suit. Stretching the suit will prevent the arm and leg wings from inflating into their correct shape (like the cells of a ram air canopy).

The main features of the maximum distance body position:

- Spread your wings but do not stretch them
- Roll your shoulders forward slightly
- Roll your elbows forward so they are at the leading edge of the armwings
- Straighten your legs and lock your knees
- Point your toes
- Slight bend at hips
- Most importantly, head bent forward with your chin on your chest

The first few times you try this body position it may feel strange, some people feel like they are flying very steep / head down when in fact they are only slightly head low. Keep practising; this is a sign you are on the right track.

To get your suit to glide efficiently you need lots of horizontal speed. The head low body position described previously will maintain a high horizontal speed but you need to use the relative wind after exit or a steep dive to accelerate the suit and achieve an efficient glide.

Once you're gliding efficiently you must remember to keep your head down. This is the most important feature of the max glide body position. Raising your head will cause you to lose horizontal speed and ruin your glide ratio. So keep your head down and look with your eyes. Try to feel the air flying over your neck and back. As with full size aircraft, a lot of the lift from a wingsuit comes from the fuselage (i.e. the torso of the body). Raising your head disrupts the airflow over your back and torso! (raising your head for a quick glance is ok though).

A maximum distance flight is best performed flying in a single straight line as your glide performance during a turn will drop significantly. Make sure you exit the aircraft in a suitable position relative to the dropzone so that you can fly directly to your desired opening point without interfering with any other airspace users. Communicate with the pilot so that you have the latest wind information.

The secret to maximizing your distance is to perform a good exit. Let the suit dive and accelerate. Then transition into your maximum distance body position and hold it, resisting the urge to raise your head! It will take a lot of practice, patience and stamina to be able to hold the position from exit to pull time.

It is wise to pull slightly higher than usual as your arms will be tired and it could take you slightly longer to locate your pilot chute and deploy. Looking at your altimeter may also be tricky in the maximum glide position so an audible altimeter is strongly recommended.



## Flight mode B: Maximum Time

To fly for maximum time involves adopting a body position that creates a huge amount of drag, putting the suit in a stall that gives you a slow decent rate to achieve the longest delay possible from a given altitude. Flying for maximum time sacrifices your forward speed and hence the horizontal distance you will cover.

The body position to achieve maximum time involves spreading the wings of the suit and applying tension to all the surface area. At the same time you must push your wings “down” against the relative wind. The resulting body position will be slightly head high compared to the horizon and with a pronounced bend (de-arch) at the hips.

The main features of the maximum time body position:

- Spread your wings; stretch them and at the same time push them down against the relative wind
- Roll your elbows forward so they are at the leading edge of the armwings
- Straighten your legs and lock your knees
- Point your toes
- Pronounced bend at hips
- Head neutral, inline with body

When flying in this position you'll have a moderate forward speed and a slow vertical speed. You'll cover less horizontal distance but your freefall delay will be longer.

## Summary

### Maximum distance:

Head low to horizon, chin on chest, wings open but not stretched

### Maximum time:

Head high to horizon, pronounced bend at hips, wings stretched and pushing down against relative wind.

When focusing on performance do not sacrifice your personal safety flying below your normal break off altitude in order to gain a few more seconds or metres.

Improving your performance requires refining your body position. To this end reading a text document can only offer limited assistance. Practice is essential; apply the advice contained in this document during numerous skydives with other competent wingsuit pilots. Take turns acting as base to provide a reference point. External video is invaluable to review your body position after each flight.

Tools such as a GPS unit (for distance) and Alti-2 Neptune freefall computer (for freefall time) and Paralog software (glide ratio and all flight data) are very useful to help track your progression. Helmet video can also be used to obtain freefall time.

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When performance matters...

