

WING SUITS

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1 GENERAL

Jumpers using wing suits **must not** attempt to land without a fully open parachute.

NOTE: This section is not a course of instruction and should be read and understood in conjunction with thorough training on wing suits.

Wing suits are specially designed jumpsuits with fabric membranes located between the legs of the jumper, and from each arm to the torso. The membranes are typically inflatable, dual-surface designs to produce lift. Wing suits slow the jumper's descent in freefall and increase glide. By using a wing suit, jumpers can stay aloft longer, and cover greater horizontal distances in freefall relative to other jumpers.

- Wing suits must be worn correctly to ensure proper performance during the flight and that safe deployment and emergency procedures can be carried out.
- Arm-torso fabric membranes should include a quick-release system that the jumper can operate in any flight mode.
- Leg-leg fabric membranes should be releasable to allow the jumper free leg movement during landing.
- All of the straps and operation handles must be accessible when the jumper is wearing the suit.

Persons who intend to use wing suits must be experienced, current and licensed skydivers. More important than the number of skydives is whether the skydiver feels comfortable in freefall, can show ability to control himself while in a long track, has the ability to observe airspace and altitude at the same time, and feels confident about his ability to perform under pressure.

Before attempting a wing suit jump, a skydiver must:

- have a minimum of 500 freefall skydives; or
- have a minimum of 300 freefall skydives, made within the past 2 years, and receive one-on-one instruction from a wing suit instructor (an approved wing suit flyer appointed by the NSTO) who is confident in the jumper's ability and has received a waiver to the 500 freefall rule from the PANAM National Safety and Training Officer.
- have completely read and understood all documentation and training information provided with the wing suit
- have the ability to perform exits and skydive in the deployment position described in this section before making a jump with the wing suit.

2 EQUIPMENT

Because of the big burble behind the back created by the speed of the wing suit flyer and the shape of the wings, and the fact that the wings restrict arm freedom, there are some restrictions about the equipment that the wing suit flyer should use.

2.1 PARACHUTE

- Do not use any kind of parachute that you feel uncomfortable or unfamiliar with.
- The main canopy should be docile in nature with consistent opening characteristics
- Problems such as abrupt heading changes or line twists on opening can become a much larger problem due to the jumper's limited extremity movement when wearing a wing suit.
- A square parachute, not elliptical, is recommended because it will have less tendency to descend rapidly if in twists.

2.2 RIG

DO NOT use a pull-out pilot chute system

DO NOT use a collapsible pilot chute that uses a bungee type of collapsing system

DO NOT use a rig that has the pilot chute mounted in the legstrap (ROL)

DO NOT use a ripcord activated, spring loaded pilot chute system for main deployment. Ripcord activated, spring loaded pilot chute system is used for reserve activation only.

DO NOT use a pilot chute that has become worn and ineffective

Use only a BOC throw-out pilot chute, or suit mounted throw-out pilot chute, deployment method with a wing suit.

Because of the large burble, a long pilot chute bridle must be used. As a minimum the bridle should be 2.5m, but 3m is recommended.

2.3 AAD's

Because it is possible to attain very slow vertical speeds with a wing suit (32km/h or 20mph) your AAD will probably not deploy your reserve. However, your rig should still be equipped with an AAD because it will still function if you are incapacitated or flying steeply

2.4 AUDIBLE ALTIMETERS

Some audible altimeters and alarms may not function properly at slow vertical airspeeds. For these reasons, it is very important to wear a visual altimeter and to open at the proper altitude. Wear your visual altimeter as far away from your body as possible (a wrist mounted altimeter is recommended) for correct reading.

NOTE: PANAM strongly recommends the use of AAD's and audible altimeters.

2.5 OTHER EQUIPMENT

An accessible hook knife should be worn. Hook knives on many rigs are not accessible when wearing a wing suit. Therefore it is recommended that a hook knife be attached to the wing suit or to the chest strap

3 PROCEDURES AND RULES OF THE SKY

It is necessary to practice exit, flight, pull and emergency techniques on the ground as well as in the air before you can do your first flight with a wing suit. It is very important to read and understand the wing suit flight manual before the first flight. It is also vital to understand the importance of communicating with the pilot and fellow jumpers about your flight plan.

3.1 PREPARE FOR FLIGHT

• Weather conditions

Because you can fly long distances with the wing suit, make sure that the weather conditions allow you to have visual contact with the ground at all times during your flight. Remember that the same physical laws apply to you as to any non-powered flyer. Your travelling distance and ground speed could differ substantially depending on whether you fly with or against the wind.

• Before boarding

Make a complete gear check before you enter the plane:

- Wings correctly assembled and cutaway cables correctly routed.
- Emergency handles in position and not covered.
- Chest strap fastened tight enough.
- Leg straps fastened inside the suit.
- Arm zippers and swoop cords in good condition.
- Pin check on your rig.
- Throw out pilot chute in correct position.

Make a few practice pulls before you enter the plane to ensure that you can reach your throw out pilot chute and to ensure that it is in the correct position. Touch your throw out pilot chute with your right arm and while doing the same move with the left arm symmetrically. Return to the flight position symmetrically. Practice your opening procedure after practice pulls. Open both of your arm zippers in a fast, controlled manner all the way up and simulate reaching the risers.

Repeat until you feel comfortable.

- **Briefing fellow jumpers, pilot etc.**

Before entering the aircraft you need to brief your fellow jumpers and the pilot about your flight pattern. Student and inexperienced wing suit flyers should exit last. Experienced wing suit flyers may exit first but this must be very early on the run-in. To avoid entering the airspace of other groups of jumpers, wing suit flyers should plan to fly the wing suit off the line of flight of the jump run. Because of the slow descent and horizontal capabilities of a wing suit, the pilot and wing suit jumper should fly away from each other following exit. Your horizontal speed can exceed 120mph. Know where you are and where the others are. **Always make a flight plan before you enter the plane**

3.2 PLANE

- **Climb to altitude**

For the climb to altitude make sure you are completely dressed for your skydive. This includes tight leg straps, tight chest strap and booties on.

3.3 FLIGHT TECHNIQUES

- **Exits**

All aircraft: exit facing the relative wind. Never jump or fly upward while exiting. Practice all exits on the ground using mock-up or the actual aircraft.

Rear side door aircraft: to prevent a collision with the horizontal stabilizer of the aircraft, perform a good poised exit with your wings closed (arms tight to your body, legs together), and keep them closed for the first couple of seconds that you are exposed to the air. After you are safely clear of the aircraft, spread your wings (both arms and legs symmetrically at the same time) and start your flight.

Tailgate aircraft: if backing out, leave with all wings closed, especially the leg wing, then open your arm wings first. Leaving with the leg wing open can result in a very fast head down movement just as you leave the ramp, which can result in your head hitting the ramp. If diving out, the wings can be slightly open and then fully opened as you clear the aircraft.

Front side door aircraft with step: a poised exit is possible but it is very important that you receive proper training in this method of exit by a wing suit instructor. It is of great importance to clear the aircraft before spreading wings. If you fail to clear, you risk having an unstable exit and hitting the aircraft (body or tail) resulting in severe damage to yourself and the aircraft.

- **Flight**

For the best performance of your wings you should maintain the wing profile. You should fly your arms and legs extended and spread while still feeling relaxed. You adjust the flight angle by using your torso and hips. For turns simply use your torso. Use small movements. Large movements may result in instability.

- **Separation**

When jumping with other wing suiters it is very important to get good separation. Much more separation is needed than in normal freefall. The unpredictable canopy opening direction coupled with the fact that for some time after opening you cannot steer the canopy, means that you will not be able to immediately steer away from another canopy in your vicinity.

- **Wave-off**

Since you cannot use your arms to wave off, you use your legs to do a wing flight wave-off: click your legs together twice while watching the airspace around you so that other jumpers can see your intention to pull.

• Pull

The most crucial part of your wing suit flight is the pull. The huge burble behind you (caused by your speed and the shape of the wings) may cause a pilot chute hesitation, and an unsymmetrical body position during pull time may cause a malfunction to your canopy. For these two main reasons it is critical that during the pull your body is stable and symmetrical and that you throw your pilot chute with a symmetrical vigorous pitch.

• Deployment sequence

- Close the legs and bring both arms to the side of the body at the same time.
- Bring both hands in symmetrically while grasping the pilot chute handle with the hand on that side.
- With the wrist of the pilot-chute hand, quickly flick the pilot chute into the air stream to the side of the jumper while bringing both arms to full wing extension symmetrically.
- Quickly retract both arms to re-collapse the wings as soon as the pilot chute is thrown.
- Keep the legs together and extended during opening. Do not bend the legs as this will put them very close to the lines of the deploying parachute. Remember, the canopy deploys towards your legs when wing suiting.

It may help to imagine yourself tracking then reaching for and throwing two pilot chutes at the same time, one with the left hand and one with the right hand

Deployment procedures should be practiced on the ground until smooth and proficient.

• Recommended deployment altitude

Beginning wing suit flyers should initiate deployment no lower than 5000 feet. Once a jumper has become comfortable with the equipment and procedures, deployment is recommended by 3000 feet. Despite the lower rate of descent of a wing suit, the same PANAM MOP minimum deployment altitudes apply to wing suit skydives as to any other type of skydive.

Attempting to land using a wing suit without deploying the parachute would likely result in serious injury or death.

• After your canopy has inflated

- Release the arm wings (typically a zipper is provided for non-emergency situations) Unzip the arm zippers – all the way up – so your arms are completely free to reach the risers and toggles.
- Leave your brakes on. Control the canopy using the back risers to maintain heading and fly clear of traffic.
- Still with your brakes on, stow your slider and release your leg wing
- Once the wing suit is ready for the remainder of the descent and landing, release the **brakes for full canopy flight**.
- Regardless of chosen deployment altitude, this sequence must be completed above the reserve drill hard deck. Failure to comply with this may result in insufficient time or altitude to complete reserve drills.

4 TRAINING PROGRAMME - BASIC STUDENT EXERCISES

4.1 GROUND SCHOOL

Training by an experienced wing suit flyer, or wing suit instructor for those with 300 to 500 freefalls, should cover the following topics and be in accordance with the wing suit manufacturer's recommendations:

- Gear selection, especially canopy choice and the deployment device.
- Rigging and wearing the wing suit.
- Aircraft pilot briefing and skydiver heading awareness during wing suit flights.
- Aircraft exit techniques.

- Basic flight techniques for wing suit flights.
- Deployment procedures.
- Emergency procedures.

4.2 INITIAL WING SUIT FLIGHTS

- Practice the leg click wave off and deployment position soon after exit on the first jump.
- Learn basic stable flight with the wing suit before trying radical turns or barrel rolls.
- Learn to control fall rate and heading with solo jumps before jumping with other wing suit skydivers.

4.3 SUGGESTED PROGRESSION FOR JUMPERS WITH MORE THAN 500 FREEFALLS

- 2 solo jumps performing basic drills, stable flight, heading control and fall rate control.
- 1 solo jump performing spiral turns in both directions.
- 1 solo jump performing barrel rolls in both directions.
- 1 solo jump performing back loops.
- 1 solo jump performing front loops.
- 1 solo jump performing back flight.
- 3 jumps with no more than 1 other experienced wing suiter approved by the CI based on their experience.

Be conversant with the full wing suit ground school, and specific instructions for the suit being used. It is recommended that the jumper receive the ground school instruction from a wing suit instructor.

An experienced wing suiter should supervise suiting-up and ground checks, and should be on the aircraft to supervise pre-exit checks and flight plan.

The jumper should wing suit, to the exclusion of all other forms of jumping, until the progression is complete.

If the jumper has not wing suited for more than 2 weeks, a further solo basic drills jump should be done.

After demonstrating to the satisfaction of the CI that he is competent to wing suit unsupervised, the following statement is to be written in the jumper's logbook by the CI; *'Cleared to jump wing suits under PANAM MOPs'*.

4.4 COURSE FOR JUMPERS WITH 300 TO 500 FREEFALLS

- 3 jumps with the instructor, performing basic drills and stable flight.
- 1 solo jump performing spiral turns.
- 1 solo jump performing barrel rolls.
- 7 jumps with no more than 1 other experienced wing suiter, approved by the wing suit instructor based on their experience.

The student is not to jump unless the instructor is on the drop zone, or in the aircraft with the student.

The instructor will give the full wing suit ground school, and brief and debrief each jump.

The instructor will supervise suiting-up and ground checks, pre exit checks and flight plan.

The instructor, or an experienced wing suiter nominated by the instructor, will supervise pre-exit checks and flight plan on his solo and formation jumps.

The student should wing suit, to the exclusion of all other forms of jumping, until the course is complete.

If the student has not wing suited for more than 2 weeks, a further solo basic drills jump is to be done

After completing the course to the satisfaction of the instructor, the following statement is to be written in his logbook by the instructor: *'Cleared to jump wing suits under PANAM MOPs'*. The jumper will then be allowed to continue jumping a wing suit.

4.5 FAMILIARISATION JUMPS FOR JUMPERS WITH 300 TO 500 FREEFALLS

- The full wing suit ground school is to be given by a wing suit instructor.
- The jumper is to perform basic drills and stable flight only.
- The jump is to be solo or with the instructor.
- The jump will not constitute part of a wing suit course, unless the course begins within 2 weeks of the jump and is presented by the same instructor.
- A familiarisation jump does not constitute a clearance to jump wing suits.

4.6 JUMPERS WITH 300 TO 500 FREEFALLS TRAINED OVERSEAS

- Jumpers who have successfully completed a recognised course of wing suit instruction overseas, and have that fact written in their logbook by the instructor who gave the course, are permitted to jump wing suits.
- Before jumping, their logbook is to be inspected by a CI or wing suit instructor. If satisfied that the jumper is trained and capable, the following statement is to be written in by the CI or wing suit instructor. *'Cleared to jump wing suits under PANAM MOPs'*.

5 EMERGENCY PROCEDURES

- If one wing comes loose in freefall the other should be released immediately.
- Routine parachute emergency procedures should be planned and carried out with the wings of the suit still attached. Your suit should be designed to allow you freedom to reach and pull both your emergency handles without restriction. That means simply that you don't need to cut away your wings first before using your emergency handles (wasting valuable time and altitude). However, to reach the toggles and risers of your reserve parachute you must either open the zippers in your arms or cut away your wings.
- If the main canopy malfunctions and requires a cutaway, the legs should be closed together to collapse the wing before operating any of your handles. Having your leg wing inflated may cause instability and turbulence.
- Unless it becomes necessary, do not waste time releasing the wings in the event of an equipment emergency.
- Avoid water landings at all costs. Without immediate help it is extremely dangerous to land in water with the wing suit. Should this occur, keep your hook knife ready, cut the wing away, undress from the suit and gear and be prepared to use the hook knife to get rid of the suit. All this can be very difficult and, in some cases, impossible. Again, avoid water landings at all costs.