



THE TUNNEL BOOK

For Instructors and Flyers

Alberto Fuertes and Lou David

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Introduction

The Tunnel Instructor Organisation is a non-profit organisation whose aim is to promote safe training and best practice within the wind tunnel industry. The 3 board members Alberto Fuertes, Brendan O’Rafferty and Paul Mayer are without a doubt amongst Europe’s most renowned players in the field of wind tunnels. This initiative combines their many years of experience, not only in flying and instructing, but also in organisation & development, daily operations and safety management.

Since 2010 Alberto Fuertes, Brendan O’Rafferty and Paul Mayer have been working on the creation of the Tunnel Instructor network to share their experience and knowledge with the entire tunnel community. With the help of Boris Nebe from Indoor Skydiving Bottrop the whole concept started to take shape, and training & instructing materials were developed. The material is based on shared best practice techniques, but continuous feedback from partners and members is crucial to ensure that we keep at the leading edge of flying skills and safe operating methods.

At this point in time, the Organisation is responsible for uniting 25 tunnels across Europe and rating over 200 instructors in 18 different countries. Of these, Alberto Fuertes and Brendan O’Rafferty have over the years trained and certified the staff of Bodyflight (UK), Windoor Empuriabrava (Spain), Alcantarilla (Spain), New Hampshire (USA), Skydive Arena (Czech Republic), Tatrlandia (Slovakia), Bodyflight (France), RealFly (Switzerland) and the Polish Army tunnel.

The aim of the Organisation is not only to guarantee that tunnel staff is educated according to what is believed to be best practice in training and safety, but also to

offer flyers and instructors the option to take part in and benefit from a swiftly growing community, connecting most of the existing tunnels in Europe, striving to maintain the highest standards of quality possible.

The Organisation offers materials free of charge. It does not warrant that the practiced instructor methods will meet your needs, and they can by no means substitute a proper course under the supervision of an appropriately rated Trainer or Examiner. With the flying manuals, the Organisation hopes to inspire both coaches and flyers on all levels, recommending the methods which are believed to be the best available to help you progress into a highly skilled flyer.

On the Organisation’s website and Facebook page, you can find the instructional videos that go with The Tunnel Book, illustrating every single move described. Our Tunnel Logbook makes it easy to keep track of your progress in the sport, including “check lists” that facilitate signing off flyers and instructors as well as logging tunnel time. As far as we know, these combined materials offer the most comprehensive tutorial collection for tunnel flying available worldwide.

We hope you enjoy learning from our book and videos. Please feel free to give feedback, support and spread the word about the Organisation and its growing network.

Co-founders of the Organisation



Brendan O'Rafferty has been involved in the skydiving industry since 1991, has over 3000 jumps and is a rated tandem instructor, freefly coach and military parachute trainer.

During the last 9 years, Brendan has been working full time as a tunnel instructor & coach, and as a Chief Examiner training the staff of various wind tunnels across Europe. Brendan is an IBA pro-rated flyer, a level 4 instructor and has a T3 trainer level.

Having completed 3 Ironman competitions, Brendan is considered to be the Organisation's "Man of Steel".

Brendan's role is the oversight and quality control of our instructor and examiner network. His remit is to ensure that the training delivered is of the highest standard with benchmarking and constant assessment of the active members. Brendan is the primary liaison for the core examiner network.



Paul Mayer is the general Manager of Bodyflight Bedford (UK), one of the first of its kind in Europe.

For Paul, tunnel safety has always been critical, continuously investing time and money in all his instructors, holding weekly safety meetings and developing standards for best practice.

With his pioneering focus on safety and quality in the sport, Paul has been one of the initial inspirations to the developers of the Tunnel Instructor Organisation.

Paul's role in the organisation is co-ordination and management in guiding the organisation to its mission. With key targets of improvement in quality standards, growth of the network and effective sustainable management of the organisation, Paul is the liaison for partner operators and organisation development.



Alberto Fuertes is the general manager at Madrid Fly (ES). Being part of the skydiving industry since 1999, he has over 3000 jumps and is a certified AFF and Tandem instructor. Since 2006, Alberto has been working full time as a tunnel instructor & coach and as a Chief Examiner, training the staff of various wind tunnels across Europe.

Achievements in the sport:

- World Cup Champion (Czech Republic, 2009)
- British National Freefly and VFS Champion (UK, 2009)
- World Games Bronze Medalist (Taiwan, 2009)
- Bedford World Challenge Silver Medalist (UK, 2009/10)
- Battle of Bottrop Silver Medalist (Germany, 2012)

Alberto's role is to manage and produce the living repository that is the heart of the Tunnel Instructor Organisation. Training Materials, Quality Standards and learning tools form the basis for this repository with constant growth and input from our partners.

Authors: Alberto Fuertes and Lou David



Alberto Fuertes holds a degree in International Business Management as well as an MBA (Cardiff, UK).

Lou David holds a Master's Degree in Communication Science and a Bachelor in Business Economics from the Catholic University of Leuven (Belgium).

Later on in life, she studied at the UCSJ in Denmark to become a physiotherapist.

With 900 skydives and 700 BASE jumps, Lou has always been fascinated by human flight. She got introduced to wind tunnel flying in 2010, and has later worked as a tunnel instructor for Copenhagen Air Experience (Denmark).

Together, Lou and Alberto have tirelessly worked on the writing of The Tunnel Book.

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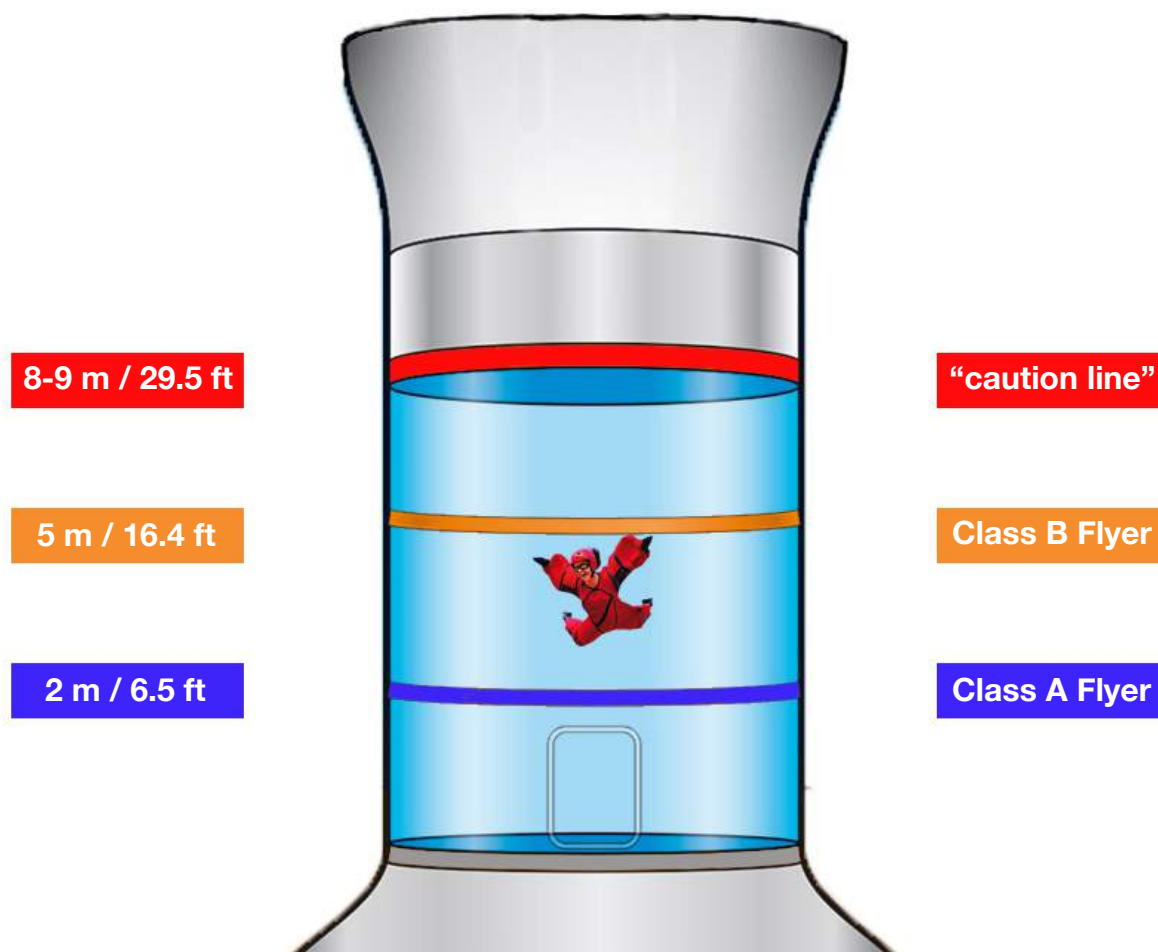
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Safety lines recommendation

We highly recommend to install safety lines in your tunnel. These lines are simply strips of adhesive tape that make a full circle around the chamber.



The general rule is that **you should not fly above the lines that you are not qualified for**. This means that first-time flyers or beginners should stay below the line that says "Class A Flyer". Once you are a Class A Flyer, you can pass the "Class A Flyer" line, but you should stay below the line that says "Class B Flyer". Once you're a Class B Flyer, you can pass the "Class B Flyer" line.

Nobody should be allowed to fly higher than 8/9 meters above the net, where the big red "Caution" line is placed.

The flyer skills are very well described in this Book and the instructional videos available online.



General Aspects

1. Tunnel Instructor

Being a tunnel instructor means being part of an exciting, fun and dynamic working environment, which is tempting for most people who engage in tunnel flying and find themselves irresistibly drawn to this fast growing sport. But the job also implies enduring hard physical work for relatively long periods of time. Working hours will often be irregular, including nights and weekends. Instructors must be willing to act as strong team players and continuously train in spite of this, while offering outstanding customer service at all times and guaranteeing safety and updated knowledge of flight instruction in general, which is constantly evolving.

The first part of this document describes the general tasks, functions and responsibilities of working as a tunnel instructor, before getting to the actual flying and spotting manuals. Becoming a tunnel instructor is much more than “having fun on the job”. It takes skill, dedication and social intelligence.

1.1 Tunnel operations and airflow dynamics

As a tunnel instructor, you will without a doubt get questions about the more technical aspects of tunnel flying and tunnel operations. Without being an expert on the matter, you have to be able to explain the basics about the tunnel’s construction and airflow dynamics, creating freefall wind speeds in a closed or open circuit.

You also have to be able to perform safety inspections, start-up procedures and basic tunnel maintenance such as exchanging worn or damaged cables as a part of your everyday routine. Any proper instructor training course will cover these basic daily wind tunnel operations, so you are

technically capable of running the tunnel and its systems.

1.2 Tunnel time management

Of great importance to tunnel time management are the time frames and cycles that flyers are moved through. This is important both from a customer service point of view, but also for peak efficiency and thereby business economics. Start gathering the flyers early enough to complete the briefing and gearing up on time. The controller should be aware of the exact rotation times of every flyer, and the instructor must assure that entering and exiting customers happens smoothly and on time, without compromising flight time of other customers, and making sure each session starts and finishes right on schedule.

A typical “customer cycle” includes

- Welcoming customers
- Orientation about the building’s facilities, a rough explanation of the experience they’re about to embark on and an explanation of the time frame
- Filling out the correct waiver forms
- Gearing up
- Briefing
- Flying
- Debriefing
- Handing out flight video and/or photos
- Saying goodbye to the customers

1.3 Gearing up customers

Before entering the classroom, all your customers should be geared up. Proper gear is essential for safety and comfort during flight. Make sure your customers remove all loose items and provide them with a jumpsuit, a helmet, goggles and ear protection and check if they are wearing

appropriate shoes. All gear must fit properly and be in good condition.

Always check for wear and tear and need for repair and take damaged or improper gear out of circulation straight away. As an instructor, you will perform a gear check when it's handed out, before proceeding to the flight chamber, and before every tunnel entry. An open suit can inflate and send the flyer upwards unexpectedly, unfastened chin straps and shoe laces can cause items to come off in flight and cause injuries or delays, just to give a few examples...!

Both your customers and yourself should never take off or untighten any of the protective gear while in the flight chamber. As an instructor, you will have to get used to wearing a helmet for longer periods at a time without removing it, even while performing a strenuous job which makes this a little uncomfortable at times.

After flight, assist your customers with de-gearing, explain them how and where to get the video and / or pictures of their flight and guide them on their way through.

1.4 Classroom procedures

Before flying any customers in the tunnel, you will give them a proper briefing about what they are about to experience, and inform them about their own responsibilities during the process. This does not only improve the safety of everyone involved, but is also key to the customer's enjoyment and the sense of being taken care of. It's a good idea to start by briefly introducing yourself to the group to make things more personal and relaxed.

Teaching a novice class usually includes watching and discussing an instructional video, briefing hand signals, and practising body positions. Allow time for questions and

answers, but learn to keep a strict time schedule as you will have to be ready on the minute with all your customers geared up when your session is supposed to start. An accumulation of small delays can cause a considerable one in the end of the day. Remember that tunnels sell valuable minutes! Instructing a class should not take more than 30 minutes.

Classroom teaching requires skills, and you will without a doubt become better at this with experience and practice. Be aware of the way you use your voice and overall body language such as posture and eye contact, the way you involve the participants and the use of teaching aids such as a white board. Displaying confidence in your own abilities by being well prepared, and always maintaining a friendly and professional attitude, even throughout a long and busy day, are probably some of the most important features to project at all times.

When working with impaired flyers, ensure the utmost of professionalism and adapt your teaching, communication and safety techniques considering the uniqueness of each situation. Always recommend ear protection for deaf people, be aware of loose items on wheelchairs in the antechamber, consider what to do with prosthetics etc.

If there is time for debriefing after flying, you should talk with your customers about their performance. Both the good and the less preferred, as well as safety aspects. To be time effective, you can give feedback to first-time flyers while retrieving and arranging the used gear. Return flyers or skydivers are preferably debriefed with the video of their flight. Use the video to evaluate your own performance as an instructor as well, and talk with your fellow instructors about how you can continuously improve. With time, you will be able to use your own experience to build up your colleagues with constructive criticism.

1.5 Hand signals

Due to the amount of noise in your working environment, hand signals will be your primary means of communication with customers, fellow instructors and the air flow controller while being inside the flight chamber. With those hand signals, you give directions, feedback and commands to prevent potentially unsafe conditions or to facilitate your teaching of flyers. Any instructor needs to have a very good understanding of the need for signals, when to use them and where to place them.

For first-time flyers, hand signals will be limited to those that help obtain and maintain a stable and relaxed, neutral belly flying position. In order to make this communication successful, briefing of hand signals prior to flight is vital to avoid confusion. However, their tunnel time is limited so there is no need for great detail, and more than often, first-time flyers perform better if they're not overwhelmed with too much information beforehand. As an instructor, you will have to find the right balance between vital and excessive information. Try to limit your hand signals for first-timers to the ones displayed on a blue back ground.

For your interaction with more experienced flyers, you can use a wider range of signals to teach more advanced flying techniques. It makes sense to brief these signals more thoroughly. Experienced flyers will be more relaxed and will have better awareness for a greater number of signals, but will also react properly to improvised communication that was not briefed beforehand.

As an instructor, you also need to be able to communicate effortlessly with the air flow controller while you are with your customers in the flight chamber. Most significantly, you have to set the desired wind speed, but you also have to communicate about recording

flight sessions, timing of customer flights, help with difficult customers, unsafe tunnel conditions and so on, all by means of non-verbal communication. Although an experienced air flow controller will be able to predict the desired wind speeds to work with, you as an instructor always have to make the final decision.

Wind speed is signalled showing a certain amount of fingers on one hand. For speeds under 50% the fingers should be pointed downwards, as well as for indicating 1 - 4%. To indicate 6 - 9% you point the fingers upwards. Wind speed of 50% is indicated with a fist. The thumb (or a thumb wiggle) is used to indicate 5%. For wind speeds above 50% the fingers can be pointed in any direction except downwards. You always signal the multiples of 10 first, followed by units.

For customers, the placement of your hand signals and the speed with which you give them is important, as it will greatly affect the flyer's understanding. Ensuring clear and visible signals will obviously encourage a better response. Make sure you brief the flyers about where they can expect you to position the signals to which they are supposed to react.

In general, be aware of your hand placement while working with customers. Make sure to avoid any inappropriate areas on the flyer's body such as the crotch, the head or a female flyer's chest.

Obviously, non-verbal communication is more than using hand signals alone. Your body language - including facial expressions and the way you move your own body - will greatly affect the customer's flight, both physically AND psychologically. Smile and stay calm and composed even in stressful situations.

Look at me / watch



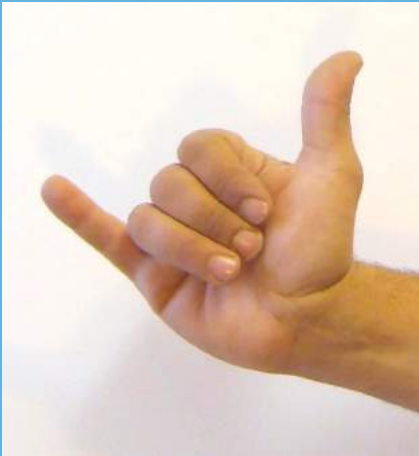
Time out



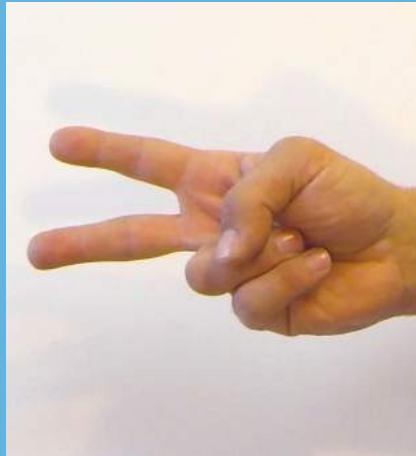
Arch



Relax



Straighten legs



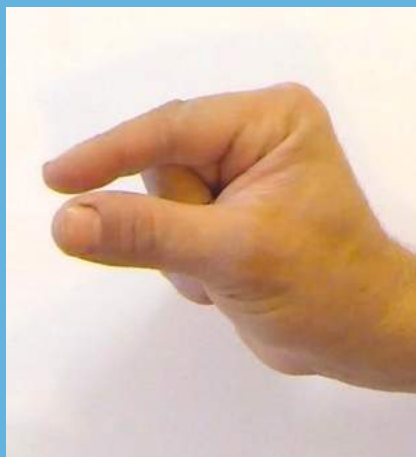
Bend legs



Good



A little (followed by adjustment)



Chin up



While briefing novice flyers, you will agree on a signal for THEM to give to the instructor in case they want to leave the wind stream before their time is used. The most common signals are “thumbs down” or “decidedly shaking the head as to say no”. The head shake is practical and safe, as it does not affect the flyer’s body position and can easily be seen by the instructor.

Opening fist: Release flyer



Take a grip



Instructor in the door



Legs wider



Legs closer



**One minute
(amount of fingers indicates)**



Ok / good



Mix-up



Stop



Stand up



To the centre



Be aggressive



How fast?



On the belly



On the back



Emergency stop



Top speed



Wind speed 10% (or 1%)



Wind speed 20% (or 2%)



Wind speed 30%



Wind speed 40% (or 4%)



Wind speed 50%



Wind speed 50%



Wind speed 55%



Wind speed 60%



Wind speed 65%



Wind speed 65%



Wind speed 70%



Wind speed 75%



Wind speed 75%



Wind speed 85%



Wind speed 95%



Put wind speed up



Put wind speed down





Sequence: **speed 62%**
Show tens then units



Sequence: **speed 67%**
Show tens then units



Sequence: **speed 12%**
Show tens then units

Obviously, there would not be many occasions on which you want to signal wind speeds of 12%. But the sequence could be used to indicate time, amount of flyers and so on.

The hand signals shown in this book are the ones that are most commonly used in tunnels across Europe. Some tunnels might use slightly different signals or even create their own. The important thing is to agree internally on how to communicate clearly as to guarantee safety and efficiency.

1.6 Spotting from the door

Spotting from the door, even more so than spotting from the net, implies swift prediction, intervention and prevention. You will only be spotting from the door when the flyers don't need close and continuous assistance, and it might be tempting to become a little too relaxed about the situation. Always use your common sense and experience to judge a flyer's skills and to know when spotting from the door can be done in a safe manner. Stay vigilant, and never let your attention weaken.

If a spot or an intervention is needed, you will have to cover a bigger distance to the flyer, and have a faster and more aggressive response. Always keep your eyes on the flyer(s) and use your experience to predict how a flyer's body position is an indicator of his movements and of what might happen. Ensure you have the necessary walking and spotting skills to spot from the door. Always stand in the centre of the door, on both feet and ready to react quickly.

When spotting from the door, you must still enter the chamber before the flyers do so, to make sure the chosen wind speed is appropriate for the flyers' experience and to be able to assist with safe entries. Also enter at the end of the rotation, to make sure the flyers leave in time or to assist with safe exits when needed.

Ideally, there should always be a spotter in the door when you're coaching flyers without having your feet on the net. In this case, a fellow instructor must be ready at the door to be able to assist at all times.

1.7 Control room duties

Tunnel instructors also take shifts as an air flow controller. This position is just as critical to safe tunnel operations as being an instructor. As an air flow controller, you have to continuously observe both the instructor and the flyer, as to intervene in an appropriate manner, while at the same time monitoring the tunnel machinery. Although all flyers are supposedly well briefed before entering the staging area, the controller can help a busy instructor to keep an eye on the people who are waiting for their turn and check if anything out of the ordinary might be going on, like e.g. a small child approaching the door, or a customer in distress.

Although the instructor always has the final decision about the desired wind speeds, you can with experience predict which wind speeds will be used for different customers in different situations. It is of vital importance to work together as a team and make sure the customers have a safe and enjoyable experience. Sometimes, a customer requires a little more attention from the instructor, often meaning the instructor needs both hands to control the flyer. In this case, hand signals are difficult and you share the responsibility to assure safety, neutralise the flyer's position and keep him on a comfortable level.

After a serious spot, turn down the wind speed to check with the instructor that nobody is injured and all are ready to continue.

All tunnels have an emergency stop, usually shaped as a big red button, that acts as a shutdown switch. Only use this button in case of real emergencies, when injuries or structural problems occur. The effects can be hard on the equipment and dangerous to the flyers and instructor.

The emergency stop should never be initialised if a flyer is above waist height. In that case, gradually reduce the power and make the flyer descend with a controlled speed. When at waist height, you can then use the emergency stop if necessary.

1.8 Emergency procedures

Although you and the rest of the team will do everything to prevent emergencies, they do happen from time to time. Standard operation and safety procedures are individual for each tunnel, and you are required to follow these in order to react to undesired situations in an appropriate and timely matter. Emergency scenarios can for example include injured flyers, violence or other undesired flyer behaviour, instructor or controller emergencies, technical tunnel malfunctions and so on.

When accidents happen, don't crowd the scene. A wobbly net is an unstable surface which might make injuries worse. We recommend that tunnel staff attends a first aid course but as a general rule you should ask an injured flyer if he's able to move by himself, if not then call an ambulance and wait for assistance. If the flyer can move, get him off the net and assess the situation.

Every tunnel should schedule time for regular safety meetings, involving discussion of relevant topics, training all the spots and monitoring the instructors' physical condition, as well as flying time for all instructors. As a team, it's important to focus on constructive criticism and encourage each other to become better, more safe and efficient.

It goes without saying that no tunnel staff should ever be under the influence of alcohol, drugs or any medicine which could slow down their reaction, or influence their balance and/or perception while on the premisses.

2. Rating system

The Tunnel Instructor Organisation makes it possible to document the experience of flyers and instructors, as to safely monitor their abilities and responsibilities. The progress of registered flyers and instructors will be logged and can be tracked on the organisation's website. As you progress through your instructor training you will be awarded with the relevant star rating. The progression and the rating you will receive as each training section is completed is as follows:

Class A Spotter	★
Class A and Class A+ Spotter	★★
Class A and Class B Spotter	★★
All the above	★★★★
Trainer	★★★★★
Examiner	★★★★★★

Chief Examiner



Flyers are rated with the respective letters:

- A** Class A Flyer
- B** Class B Flyer

2.1 Who can do what?

All rated instructors should be able to perform the fitness test before their initial training and a follow-up of any instructor's physical condition should be done with regular intervals, preferably showing measurable improvements over time. The better shape an instructor is in, the less likely accidents will occur and instructors or flyers will get hurt. You can find the video of the fitness test on the organisation's website and Facebook page.

To pass the fitness test, one has to be able to do

- 6 pull-ups overhand
- Jogging on the spot for 45 seconds
- 25 sit-ups in 40 seconds
- 25 push-ups in 40 seconds
- Touch toes for 25 seconds
- Move 50 kg 10 meters

To be certified as a Class A Flyer, one has to be able to perform all the moves as described in the “Class A Flyer - Static” manual in a safe and controlled way, without the need for assistance. To become a Class B Flyer, one must be able to perform all the moves as described in all the flyer videos, i.e. both static *and* dynamic, in a safe and controlled way, without assistance.

A Class A Spotter has to possess basic flying skills as described in the “Class A Flyer - Static” manual, and must be able to perform all the moves and spots of the “Class A Spotter” manual. The same applies to “Class A+ Spotters” and “Class B Spotters”, but those have to additionally be able to perform all the moves described in the respective manuals. All rated instructors need to be able to answer the questionnaire at the end of this book without mistakes.

Trainers, Examiners and Chief Examiners have to possess the skills to perform all the moves and spots as described in all the flyer and spotter manuals.

2.2 Who can teach who?

Besides taking recreational first-time flyers, Spotters can only assist in the teaching of flyers on a level that is according to the spotting skills they are signed off for. This means that a Class B Spotter can spot for a Class B Flyer, most likely while assisting a coach, but doesn't necessarily need to possess the same flying skills.

Being signed off as a Trainer implies that you can teach all spotter courses and train / spot both Class A and Class B Flyers. In general, Trainers, Examiners and Chief Examiners can teach all flyer levels, and can teach instructors who are ranked below their own rating.

2.3 Who can sign off who?

Instructors get their rating from a certified Examiner. A video of the final exam (mix-up) has to be posted on publicly accessible social media such as Youtube, Vimeo, Facebook etc and the link has to be added to your profile on the tunnelinstructor.org website.

All rated instructors can sign off flyers on the same or a lower level. This means that a rated Class A or Class A+ Spotter can only sign off Class A Flyers.

To become a Trainer, you have to shadow and assist an Examiner on each of the 3 spotter courses. Only an Examiner or Chief Examiner from the organisation can then sign you off as a Trainer if you performed successfully. A Trainer is then allowed to train tunnel instructors of all levels, but is not allowed to sign them off as such. This will again be done by an Examiner or Chief Examiner when they successfully pass a final test.

To become an Examiner you have to be on an official course under the supervision of at least one of the organisation's Chief Examiners. Examiners can only be signed off as such with the approval of **two** of the organisation's board members. An Examiner can then sign off all flyer levels, and all instructor ratings below his own.

There will only be a few Chief Examiners at the same time also appointed by the board members. Only Chief Examiners have the privilege to revoke ratings below their own.

Who can do what?

		Can perform all the moves of the following manuals								
		Fitness Test	Class A Spotter - Part I	Class A Spotter - Part II	Class A+ Spotter	Class B Spotter	Class A Flyer - Static	Class A Flyer - Dynamic	Class B Flyer - Static	Class B Flyer - Dynamic
Instructors										
Class A Spotter	★	★	★				★			
Class A+ Spotter	★	★	★	★			★			
Class B Spotter	★	★	★			★	★			
Trainer	★	★	★	★	★	★	★	★	★	★
Examiner	★	★	★	★	★	★	★	★	★	★
Chief Examiner	★	★	★	★	★	★	★	★	★	★
Flyers										
Class A Flyer							★			
Class B Flyer							★	★	★	★

Who can teach who?

	Instructors	Class A Spotter	Class A+ Spotter	Class B Spotter	Trainer	Examiner	Flyers	Class A Flyer	Class B Flyer
Instructors									
Class A Spotter							★		
Class A+ Spotter							★		
Class B Spotter							★	★	
Trainer		★	★	★			★	★	
Examiner		★	★	★	★		★	★	
Chief Examiner		★	★	★	★	★	★	★	

Who can sign off who?

	Instructors	Class A Spotter	Class A+ Spotter	Class B Spotter	Trainer	Examiner	Flyers	Class A Flyer	Class B Flyer
Instructors									
Class A Spotter							★		
Class A+ Spotter							★		
Class B Spotter							★	★	
Trainer							★	★	
Examiner		★	★	★	★		★	★	
Chief Examiner		★	★	★	★	★	★	★	



Class A Flyer - Static

To watch the video visit the website at www.tunnelinstructor.org
or the Facebook page at www.facebook.com/Tunnelinstructor

3. Belly Flying

The most common position is the belly flying position. In this position there are 8 points of motion to learn; forwards and backwards, 360° turns (left and right), slow fall (up), fast fall (down), and side slides (left and right). This section starts with describing the “neutral” position, essential for stability.

3.1 Neutral

The most important position of all is being able to fly stable in one place, without any point of motion. This is called “neutral” or “box position”, and is illustrated in picture 1.



picture 1

- Look straight ahead with your chin up, keep your body straight and symmetrical
- Keep your chest slightly raised and your hips pushed down towards the net, creating an arching position
- Your knees should be slightly higher than your hips and they should be bent, with the toes pointed
- Relax your back, allowing the wind to support your body in this arching position
- Spread your arms evenly on the wind with a 90° bend in the elbows
- Your elbows should be just in front or in line with your shoulders

- Keep your hands open on the wind and in front of your head, so that they are just below eye level

3.2 Entrance

In the beginning, the neutral belly position as described in the previous section will be the flying position you revert to right after entering the tunnel. To enter the wind stream safely and easily, it is important not to fight the wind, but to “cut through” the air stream.

- Stand in the door with your legs together and bring your arms in to your chest, with your hands near your arm pits (picture 2)
- Look straight ahead, and keep your chin up
- Keep your hips forward in a slightly arched position while you let yourself “fall” into the wind stream
- Relax your body, allowing yourself to slip through the air
- Push off gently with your legs
- Open up your arms and start flying the neutral position straight away



picture 2

3.3 Forwards

Once stable in the belly flying position, you can begin practising movements. Forward movement in the belly position should begin with the legs closest to the wall from which you are moving away.

When learning to fly forwards, it is important to give small, slow input to begin with. The more deliberate your input, the faster you will move. We get most of our forward speed by straightening the legs, so to begin with, straighten your legs only a little.

- Start in the neutral belly flying position
- Position yourself feet towards the wall (picture 3)
- Straighten your legs slowly and smoothly
- Keep your chin up to help with maintaining the arching position and look straight ahead
- Bring your arms back slowly, allowing forward movement (picture 4)
- Keep your body and head straight
- Remain arched throughout the entire movement



picture 3



picture 4

3.4 Backwards

As with forward movement, the same applies for moving backwards. We move by bending the legs and straightening the arms. The more deliberate your input, the faster you will move, so use small, slow movements to begin with. This time, you will start with your head closest to the wall from which you are moving away.

- Start in the neutral belly flying position, with your hands placed towards the wall
- Keep your chin up, and look straight ahead
- Bring your legs together
- Bend your knees
- Slowly push your arms out in front of you, as though you are pushing off the wall
- You may need to cup some air with the chest, allowing for the surface area lost when bending the legs (picture 5)



picture 5

3.5 Turning 360°

This movement is spinning the body on an axis, 360° degrees from the starting position and coming back to that position. Again, the more deliberate your input, the faster you will move.

- Start in the neutral belly flying position in the centre of the tunnel
- Raise one elbow, and drop the opposite elbow - emphasise the raising of the elbow rather than the dropping
- The dropped elbow leads the turn, meaning you will turn to that side
- At the same time, drop your knee on the opposite side of the dipped elbow, and put it slightly out to the side
- These combined movements will spin the body on its axis (picture 6)
- Don't twist your spine, your body should remain straight
- Arch slightly more during the movement, to stay on level
- Keep your chin up to help maintain this arching position



picture 6

Once passing through 270° of the turn, you should change your position to neutral or to the opposing position, in order to slow down the momentum and avoid over rotating, so you end up on the correct heading.

- To stop the turn, simply go back to the neutral position

- If the turn was fast, you will have to counteract the turning movement with the opposing position, i.e. raising the opposite elbow and dipping the opposite knee
- Often a larger movement than the initial input will be needed to stop a fast turn
- Once you stopped the turn or slowed down the movement, you can go back to the neutral position

3.6 Up (slow fall)

When skydiving, this position is used to achieve a slower fall rate. In the tunnel, this position will cause you to move upwards, so start close to the bottom net. Again, the more deliberate your input, the faster you will move, so keep your movements slow and smooth to begin with.

- Start in the neutral belly flying position, close to the net
- Push your arms forwards slowly
- Simultaneously straighten your legs to balance with your arms, but keep your hips still, do not lift them
- Slightly de-arch your back by sucking in your chest (as if being punched in chest) to catch more wind
- Look down at the net to help with de-arching the chest
- Spread your arms and legs wider to create a larger surface area (picture 7)

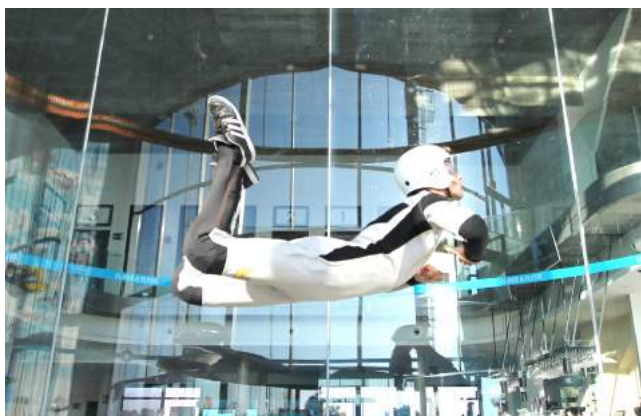


picture 7

3.7 Down (fast fall)

When skydiving, this position is used to achieve a faster fall rate. In the tunnel, this position will cause you to move downwards, so start this movement just above head height.

- Start in the neutral belly flying position in the centre of the tunnel
- Bring your legs together slightly
- Bring your arms in towards your chest, with your hands near your arm pits
- Lift your chin to encourage a bigger arch
- Relax your body and allow it to slip through the wind (picture 8)
- Remember to stop the movement with the opposing movement before hitting the bottom net



picture 8

3.8 Side slide

Side sliding will move your body across the tunnel while keeping a constant heading. Again, the more deliberate your input, the faster you will move.

- Drop the knee and elbow of the leading side slightly, to move your body in that direction
- Keep your body straight, don't twist your spine

- Your opposite arm should be raised and extended, to help keep your body straight and on heading
- Your opposite leg should be slightly extended out and up to keep the bottom half of your body on heading and inline with the top half
- Your chin should be up throughout the movement to help maintain a good arching position (picture 9)



picture 9

3.9 Exit

To exit the wind stream, make sure you are flying on an appropriate level according to the door.

- Adjust your heading towards the door and start flying forwards
- Do not reach out for the door frame too early - straightening your arms will cause opposite movement and push you away from the door, or it could cause undesired lift in combination with your straightened legs
- Once at the door frame, take a firm grip with both hands
- Keep your chin up
- Bend your hips, and step out of the wind stream (picture 10)



picture 10

OR

- Adjust your heading away from the door and start flying backwards
- Once your feet reach the frame, put your legs together and drop your knees
- Maintain a slow backwards movement and lower your feet to make contact with the floor
- Cup some air with the chest, allowing for the surface area lost when bending your knees and dropping your legs (picture 11)



picture 11

Remember there is no wind stream on the other side of the door. When exiting head first, take a firm grip on the door frame to support your body. When exiting feet first, you will have to compensate with your upper body for the loss of surface while your legs exit the tunnel.

Remember:

This section covered the neutral belly flying position, together with 8 points of motion related to this position.

When learning to move around on your belly, keep the input of your arms and legs small to begin with. The more deliberate your input, the faster the moves will be. It's better to start slowly and smoothly, and learn how to precisely control your planned moves, rather than going too fast too soon, and possibly get hurt in the process.

Once passing halfway through a move, you will need to change your body position to the opposing position, in order to slow down the momentum and either return to a neutral belly flying position, or begin positioning for the next movement. This will make your flying safer, and your transitions more fluid.

If you feel insecure, or you are about to lose control, simply relax, breathe out and return to the neutral belly flying position. Keep your chin up and arch.

As with everything else in life, all of the above will become easier with practice and experience.

4. Back Flying

Back flying is a back to earth position. In this position there are also 8 points of motion to learn; forwards and backwards, 360° turns (left and right), slow fall (up), fast fall (down) and side slides (left and right). This section also starts with the neutral position, essential for stability.

4.1 Neutral

The most important position of all is being able to fly stable in one place, without any point of motion. This is again called “neutral”, and is illustrated in picture 12.



picture 12

- Keep your chin up and hold your head back, this is most important for stability
- Push your chest out, by pressing your shoulders back on the wind
- Put your arms up, bend them slightly at the elbows
- Keep your body straight, twisting your spine will cause you to spin
- Your legs should be positioned evenly apart on the wind, with your knees vertically aligned with your hips - angling them 90°
- The outside of your thighs should be running vertically with the wind, and your calves should press down on the wind horizontally

4.2 Entrance

In the beginning, it is possible you will be told by your instructor to walk to the centre of the tunnel, get down on your back on the net, and start practising the neutral back flying position from there. As you get more comfortable in the neutral position, you can start entering the wind stream on your back directly.

To enter the wind stream back flying, it is easiest to place yourself in the door with your back towards the wind.

- Grab the door frame with both hands
- Bend your legs at the hips and knees, as if you were to sit down



picture 13

- Present your back on the wind, and feel the support of the air stream
- Keep your chin back, and arch your back slightly before letting go of the door frame, so the wind keeps your upper body from falling down on the net (picture 13)
- Lower your upper body to a horizontal position
- Push off gently with your legs and start flying the neutral back position straight away
- Keep your hips bent, don't push your hips up when trying to enter the wind stream - this will only push you back towards the door

4.3 Forwards

Once stable in a back flying position, you can begin to move around. Forward movement in the back flying position should begin with your head closest to the wall from which you are moving away. We get most of our drive by straightening the arms and bending the legs. The speed of the movement increases the more deliberate the input, or the longer the position is held. So use small, slow input to begin with, and keep the movement controlled.



picture 14

- Start in the neutral back flying position
- Position yourself with your head closest to the wall you are moving away from
- Keep your chin back, and look up
- Bring your knees in towards your chest
- Push back firmly with your arms on the wind, past your head (pictures 14 & 15)



picture 15

4.4 Backwards

Backward movement in a back flying position should begin with your legs closest to the wall from which you are moving away. As with forward movement, the same applies for flying backwards. The speed of the movement increases the more deliberate the input, or the longer the position is held, so use small, slow movements to begin. We get most of our drive by straightening the legs and pushing off with the arms.



picture 16

- Start in the neutral back flying position
- Position yourself with your feet closest to the wall you are moving away from
- Tuck your chin into your chest
- Slowly straighten your legs
- Keep your elbows bent at 90°, rotate your arms and hands towards your feet
- Slowly press down on the wind with your hands (picture 16)

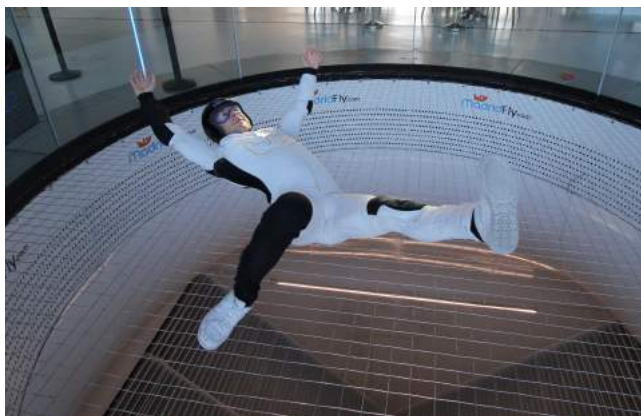
4.5 Turning 360°

This movement is spinning the body on an axis, 360° degrees from the starting position and coming back to that position. Again, the more deliberate your input, the faster you will move.

- Start in the neutral back flying position
- Keep your chin back, and look up
- Keep your hips level and with a 90° bend
- Keep your spine straight
- Bring down one elbow at a right angle to your body, this is the side you will turn to
- Push your hand down slightly to push off on the wind
- There are a few ways to use your legs to turn, but it is easiest to simply move your feet towards the direction you want them to turn
- This movement will spin the body on its axis (pictures 17 & 18)



picture 17



picture 18

Once passing through 270° of the turn, you need to return to the neutral position or change your position to the opposing position, in order to slow down the momentum and avoid over rotating, so you end up on the correct heading.

4.6 Up (slow fall)

When skydiving, this position is used to achieve a slower fall rate. In the tunnel, this position will cause you to move upwards, so start this movement close to the bottom net. The bigger and faster the input, the faster you will go up, so begin with small moves.

- Start in the neutral back flying position, in the centre of the tunnel
- Keep your chin up and your head back
- Push your arms out above your head
- Push your chest out, as if taking a deep breath
- Push your knees out to gain surface area on the side of your thighs, and straighten your arms and legs to catch more wind, creating lift (picture 19)
- Keep your hips bent, pushing them forward might cause you to become unstable



picture 19

4.7 Down (fast fall)

When skydiving, this position is used to achieve a faster fall rate. In the tunnel, this position will cause you to move downwards, so start this movement just above head height. The bigger and faster the input, the faster you will lose height, so begin with small moves.

- Start in the neutral back flying position in the centre of the tunnel
- Tuck your chin in and round your back
- Put your arms and legs up, and relax them
- The more curved your position (shuttlecock position), the faster you will fall (picture 20)
- Shift to the opposing position (slow fall rate) to stop the movement before hitting the net



picture 20

4.8 Side slide

A side slide will move your body across the tunnel while keeping a constant heading. The bigger and faster the input, the faster you will slide, so begin with small moves.

- Start in the neutral back flying position close to the wall
- You should have your leading side away from the wall
- Drop the leading elbow slightly and point your feet in the same direction
- Use your opposite arm, extended perpendicular to your body, to push off on the wind
- You can place your finger tips on the dipped elbow side against your chest to help with the correct body position
- Keep your chin back and your body straight throughout the movement (picture 21)



picture 21

4.9 Exit

To exit the wind stream on your back, make sure you are flying on an appropriate level according to the door.

- Adjust your heading towards the door and initiate forward movement
- Once at the door frame, drop your feet and make contact to the floor, keeping your hips slightly bent (picture 22)
- Keep your chin back
- Expand your chest and push your arms out above your head, this will lift your upper body
- Stand up straight and walk out



picture 22

Remember:

This section covered the neutral back flying position, together with 8 points of motion related to this position.

When learning to move around on your back, keep the input of your arms and legs small to begin with. The more deliberate your input, the faster the moves will be. It's better to start slowly and smoothly, and learn how to precisely control your planned moves, rather than going too fast too soon, and possibly get hurt in the process.

Once passing halfway through a move, you need to change your body position to the opposing position, in order to slow down the momentum and either return to a neutral back flying position, or begin positioning for the next movement. This will make your flying safer, and your transitions more fluid.

If you feel insecure, or you are about to lose control, simply relax and return to the neutral back flying position. Keep your head back for stability.

As with everything else in life, all of the above will become easier with practice and experience.

5. Transitions

Transitions are a range of movements designed to take you from one stable position to another, with control and in a safe manner.

5.1 Barrel roll - belly to back

This transition will roll you through 180° from a stable belly flying position to a stable back flying position.

- Start in a stable belly flying position
- While keeping your chin up, stretch out your arms and drop one knee under your body (picture 23)
- The knee that is dropped is the one that starts the barrel roll, so you will roll to that side
- Both your legs should be bent in a back flying position during the roll, to counteract any forward drive
- Once on your back, keep your chin back and your legs bent at your hips and knees
- Expand your chest to prevent losing lift
- Continue in a stable back flying position (picture 24)



picture 23



picture 24

Ideally, this transition is performed without forward or backward drive, and without loss or gain of height. In the beginning, it is a good idea to keep eye contact with your instructor, stood at your head-end.

5.2 Barrel roll - back to belly

This transition will roll you through 180° from a stable back flying position to a stable belly flying position.

- Start in a stable back flying position
- Stretch out both arms and cross one bent leg under the other
- The leg that crosses under is the one that starts the barrel roll, so you will roll to that side (picture 25)
- Keep your chin up and your legs bent at the hip
- Once on your belly, straighten out and continue in a stable belly flying position (picture 26)



picture 25



picture 26

Ideally, this transition is performed without forward or backward drive, and without loss or gain of height. In the beginning, it is a good idea to keep eye contact with your instructor, stood in front of you.

5.3 Barrel roll - belly to belly

This transition is a roll from a stable belly flying position, through 360°, returning to a stable belly flying position.

- Start in a stable belly flying position
- Keep your chin up
- Hold your arms straight, pushed out in front of you
- At the same time, drop one knee and push it under your body (picture 27)
- The knee that is dropped is the one that starts the barrel roll, so you will roll to that side
- Keep your hips and knees bent during the roll while on your back, to prevent forward drive
- As you continue the roll over to a stable belly flying position again, straighten your legs back out for stability

Ideally, this transition is performed without forward or backward drive, and without loss or gain of height. In the beginning, it is a good idea to keep eye contact with your instructor, stood in front of you.



picture 27

If you straighten your legs during the barrel roll, you will create a lot of forward drive.

If you don't straighten your arms out in front of you during the barrel roll, you will create a lot of forward drive.

Either of the above can cause enough forward drive to make you hit a wall.

5.4 Barrel roll - back to back

This transition is a roll from a stable back flying position, through 360°, returning to a stable back flying position.

- Start in a stable back flying position
- Stretch out both arms and cross one bent leg under the other
- Keep your chin up and your legs bent at the hip
- Roll over and return to a stable back flying position

5.5 Belly to stand

This transition will take you from a stable belly flying position to a standing position. At this stage, it will mainly be used as a step in between changing from a belly to a back flying position, transitioning over a vertical axis in stead of a barrel roll. It is also used by belly flyers who would like to exit the tunnel by walking out.

- Start in a stable belly flying position, you should be no higher than waist height
- Keep your chin up, and look straight ahead
- Lower one leg, bending it at the hip, and place your foot on the net, keeping a slight bend in the knee (picture 28)
- Your second leg should now follow, bending at the hip and knee. As this leg comes through, your body will start to straighten up
- Place your other foot on the net and stand up straight



picture 28

Your legs should come down one at the time, but only 1 or 2 sec. apart.

You can of course bring both legs down simultaneously, but make sure you keep your chin up, your chest arched and your hips bent to prevent being thrown backwards and up.

5.6 Stand to belly

This transition will take you from a standing position to a stable belly flying position. At this stage, it will mainly be used as a step in between changing from a back flying to a belly flying position, transitioning over a vertical axis in stead of a barrel roll.

- Stand with both feet on the net
- Bend both your legs at the hips and knees
- Keep your chin up and your chest pushed out to prevent being thrown backwards and up (picture 29)
- Bring your feet up, either simultaneously or one at the time with a short interval
- Once horizontal, straighten out your body and continue in a stable belly flying position (picture 30)



picture 29



picture 30

5.7 Stand to back

This transition will take you from a standing position on the net to a stable back flying position. Again, this is a step in between changing from a belly to a back flying position, transitioning over a vertical axis in stead of a barrel roll.

- Stand with both feet on the net
- Push your arms out above your head
- Keep your chin up to avoid rounding your chest
- Bend your legs at the hips and knees, as if you were to sit down
- Expand your chest to catch the air on your back and prevent you from falling down on the net (picture 31)
- Take your legs up, either simultaneously or one at the time with a short interval (picture 32)
- Keep your hips bent to prevent being thrown forwards and up
- Continue in a stable back flying position



picture 31

5.8 Back to stand

This transition will take you from a stable back flying position to a standing position. It's a step in between changing from a back flying to a belly flying position, transitioning over a vertical axis in stead of a barrel roll. It can also be incorporated in back flying classes as an alternate means to leave the flight chamber, i.e. whilst walking.

- Start in a stable back flying position, stay low
- Keep your chin back at all times to avoid rounding your chest
- Tuck in your feet towards your bum
- Always keep your hips bent to prevent being thrown forwards and up
- Lower your feet down to make contact with the net
- Expand your chest and push your arms out above your head (not to the side), this will lift your upper body (picture 33)
- Stand up straight



picture 33



picture 32

5.9 Belly to back

This transition will take you from a stable belly flying position to a stable back flying position through the sit position. This means, over a vertical axis in stead of a barrel roll.

- Start in a stable belly flying position and initiate a little upward movement
- Create extra upper body lift by extending your arms and sucking in your chest (as though being punched in chest) to catch more wind - creating upper body lift is very important
- As your upper body starts to lift, bend at the hips and bring your knees in under your body (picture 34)
- When you go through the sit flying position, remember to open up your chest to catch the wind on your back and prevent you from falling down on the net
- Keep looking up and continue in a stable back flying position (picture 35)



picture 34

5.10 Back to belly

This transition will take you from a stable back flying position to a stable belly flying position through the sit position. This means, over a vertical axis in stead of a barrel roll.

- Start in a stable back flying position
- Create upper body lift by pushing your arms up above your head, and expand your chest to catch wind with your back
- Open your knees at the same time to catch a little lift with the lower part of your body as well
- As you start to move up, bring your knees back in a little and kick your heels down to create the momentum to help you flip onto your belly (picture 36)
- When you go through the sit flying position, remember to keep your chin back and push your hips forward to continue into a stable belly flying position (picture 37)



picture 36



picture 35



picture 37

5.11 Front layout

This transition will take you from a stable belly flying position to a stable back flying position while traveling over your head. This means, over a vertical axis in stead of a barrel roll.

- Start in a stable belly flying position and initiate lift
- Straighten your arms while bringing them back towards your feet (picture 38)
- At the same time, bend your hips a little but straighten your knees to create lower body lift
- Keep your chin up the entire time, which means you will be watching the net halfway through the transition (picture 39)
- Continue in a stable back flying position
- You will have to straighten out your body to stop the momentum and prevent you from hitting the net, before continuing in the neutral back flying position (picture 40)



picture 40



picture 38



picture 39

Remember:

This section covered different transitions between a belly flying, a back flying and a standing position.

The more deliberate your input, the faster the moves will be. It's better to start slowly and smoothly, and learn how to precisely control your planned moves, rather than going too fast too soon, and possibly get hurt in the process.

Normally, your instructor will be there to guide you through the transitions safely, and will in the beginning take a firm, controlling grip to prevent you from flying into the tunnel walls.

If you feel insecure, or you are about to lose control, simply relax and return to a neutral flying position, either on your belly or on your back.

As with everything else in life, all of the above will become easier with practice and experience.

6. Combined moves

When you can fly stable and move in all directions both on your belly and on your back, and you master the transitions to get you from one position to the other, only your imagination sets a limit for the ways you can combine these moves into fun, dynamic flying.

Try to give slow and controlled input, so your moves and transitions become as smooth and fluid as possible.

Have fun and be safe!



Class A Flyer - Dynamic

To watch the video visit the website at www.tunnelinstructor.org
or the Facebook page at www.facebook.com/Tunnelinstructor

7. Dynamic low speed flying

The step from fluently combining all your Class A Flyer moves to flying “dynamic” on low wind speed is little, and a natural progression of your flying skills.

The word dynamic means “*characterised by continuous change, activity, or progress*” and applied to tunnel flying it means you will be in constant motion, combining different techniques into various composed moves, using the available air space to its maximum capacity. Inface carving, e.g. is essentially a combination of forward movement with a turn.

The suggested moves to practice on a basic level are listed on the right and shown in detail in the online videos, but the possibilities for combining your moves are basically endless. The assistance of a skilled coach might speed up your understanding of this type of flying in the beginning.

7.1 Suggested dynamic moves

Head up

- Back to belly - long transition
- Belly to back - long transition
- Head up inface carving
- Head up inface carving changing direction
- Head up outface carving
- Head up outface carving changing direction
- Head up outface carving into head up inface carving
- Head up inface carving into head up outface carving

Head down

- Head down inface carving
- Head down inface carving changing direction
- Head down outface carving
- Head down outface carving changing direction

Head up and head down

- Head up inface carving into head down inface carving
- Head up outface carving into head down outface carving
- Back layout
- Back layout into head down outface carving
- Front layout into head down inface carving
- Head down inface carving into layout
- Stalls
- Stalls into layout
- Head down inface carving into head down outface carving
- Head down outface carving into head down inface carving

Transitions

- Belly to belly - front flip
- Belly to belly - back flip
- Back to back - front flip
- Back to back - back flip



Class A Spotter

To watch the video visit the website at www.tunnelinstructor.org
or the facebook page at www.facebook.com/Tunnelinstructor

8. Walking

As a tunnel instructor, you will spend most of your time walking on the net. It is important to master all the aspects of walking from the beginning, as all the drills and spotting techniques become much easier to deal with when you have good walking skills and you know how to work with the wind.

To remain in control while walking, it is key to use small steps and walk with flat feet. Walking with flat feet will reduce the risk of tripping or your foot slipping through the net.

8.1 Forwards

To walk forwards **slowly**

- Bring your hands in to your chest, this reduces the surface area you're presenting to the wind
- Lean back slightly with your upper body and feel the wind push against your back
- Move forwards with small steps (picture 41)
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips



picture 41

To walk forwards at a **medium** speed

- Bring your arms down to your waist to increase the surface area of your upper

body, keep them straight and a little bit out to the side

- The palms of your hands should be facing back
- Lean back slightly with your upper body and feel the wind push against your back
- At the same time, press onto the wind with your arms and hands, keeping them aligned with your upper body
- Move forwards with small steps (picture 42)
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips



picture 42

To walk forwards **fast**

- Bring your arms up above your head to maximise the surface area of your upper body, with the palms of your hands facing forwards
- Lean back with your upper body
- At the same time, press your arms back behind your head
- Move forwards with small steps (picture 43)
- Be careful not to become overpowered
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips



picture 43

- Lean forwards with your upper body and feel the wind push against your chest
- At the same time, press onto the wind with your arms and hands, keeping them aligned with your upper body
- Move backwards with small steps, making sure you always keep the bend at your hips (picture 45)
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips

8.2 Backwards

To walk backwards **slowly**

- Bring your hands in to your chest, this reduces the surface area you're presenting to the wind
- Lean forwards slightly with your upper body and feel the wind push against your chest
- Move backwards with small steps, making sure you always keep a bend at your hips (picture 44)
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips



picture 45

To walk backwards **fast**

- To Bring your arms up above your head to maximise the surface area of your upper body, with the palms of your hands facing forwards
- Lean forwards with your upper body
- At the same time, press your arms forward in front of your head
- Move backwards with small steps, making sure you always keep the bend at your hips (picture 46)
- Be careful not to become overpowered
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips



picture 44

To walk backwards at a **medium** speed

- Bring your arms down to your waist to increase the surface area of your upper body, keep them straight and a little bit out to the side
- The palms of your hands should be facing forward



picture 46



picture 47

8.3 Sideways

Although the sideways walk is not often used as an isolated move, it forms the basis for inface and outface carving, and is therefore an important skill to master.

A good understanding of foot positioning is key to reduce the risk of tripping. Always place the trailing foot behind the leading one (the leading foot being the one on the side you are moving towards).



picture 48

To walk sideways

- Twist your upper body to one side
- Lean forwards with your upper body and straighten out the arm on the side you are bending to - this will produce the drive away from that side (picture 47)
- Keep your other arm closer to your body and bent, with your elbow pointing down slightly (picture 48)
- Your arms are positioned in a way you would use them to side slide in a belly flying position
- Move sideways with small steps, placing your trailing foot **behind** your leading one
- To stop the movement, give a short but deliberate opposite input with your upper body, pivoting around your hips

Your arms are used for balance and drive. The more you push out the straight arm and the more you bend forwards, the faster the movement will become. Be careful not to become overpowered.

8.4 Inface carving

The inface carving walk is probably the one you will use most while spotting flyers. It allows you to move around the tunnel fast and remain in a side body position to the flyer. Inface carving is basically forward movement combined with sideways movement, resulting in a turn.

Again, a good understanding of foot positioning is key to reduce the risk of tripping. Always place the trailing foot **behind** the leading one (the leading foot being the one on the side you are moving towards). While inface carving, this foot positioning also helps you to keep your hips pointing towards the centre of the tunnel. Move slowly in the beginning so you can focus on the correct foot and hip positioning. Once you understand this well, you can start carving faster.

To inface carve

- Position yourself close to the wall, facing the centre of the tunnel
- Lean back with your upper body, as if you would walk forward
- Your arm placement will guide the carving movement (picture 49)
- Bend your leading arm at the elbow and place your hand close to your chest - push back slightly with your elbow in order to catch the wind and produce sideways drive (similar to the use of your leading arm while side sliding in a back flying position)
- Raise your trailing arm above your shoulder, at about a 45° angle to your head
- To stop the movement, you can twist your upper body slightly and briefly present

your back to the direction you are carving in, as if you would “over rotate” the carve.



picture 49

The more you present your upper body to the wind, the faster you will carve. Once you understand the foot placement well, a little speed will actually make the carving easier and more fluid. Remain strong with your legs to avoid losing control.

8.5 Outface carving

The outface carving walk is often overlooked, although it's just as important to learn and use as the inface carve. Outface carving is especially important to follow a flyer above head height, while remaining in a side body position.

As with the inface carving, it is important to understand correct foot placement. This time, you have to put the trailing leg **in front** of the leading leg to reduce the risk of tripping, and to help keep your hips facing towards the tunnel wall. Move slowly in the beginning so you can focus on the correct foot and hip positioning. Once you understand this well, you can start carving faster.

To outface carve

- Position yourself facing the tunnel wall
- Lean forward with your upper body, as if you would walk backwards
- Always keep a bend at the hips
- Your arm placement will guide the carving movement
- Bend your leading arm at the elbow and place your hand close to your chest - press down with your elbow in order to catch the wind and produce sideways drive (similar to the use of your leading arm while side sliding in a belly flying position)
- Raise your trailing arm above your shoulder, at about a 45° angle to your head
- To help control the movement and direction, turn your shoulders slightly and look in the direction you are moving (picture 50)
- To stop the movement, you can briefly present your chest to the direction you're moving in, as if you would "over rotate" the carve

The more you present your upper body to the wind, the faster you will carve. Once you understand the foot placement well, a little speed will actually make the carving easier and more fluid. Remain strong with your legs to avoid losing control.



picture 50

8.6 Pushing back

When you've learned all walking methods you can start blending them together and switch from one to another. There are several ways to do this, they range in difficulty but all are vital to learn and understand. Throughout all the transitions, it is important that you remain mindful of your foot placement. Positioning your feet correctly will allow for an easier transition, and prevents tripping or stumbling.

Pushing back is the first transition to learn.

- Start walking either inface or outface carving
- Push back on the wind with your upper body, generating a more powerful drive pushing you towards the centre of the tunnel
- As you are getting pushed out of the carve, use the momentum to transition into the opposite carving position, but keep traveling in the same direction
- The transition should only take a couple of steps

At first this transition will be made easier by using a lot space, almost cutting the tunnel into a square. Once you get comfortable with this transition, you should aim for it to become almost on the spot.

8.7 On the spot switch

As opposed to the above mentioned transition, an “on the spot switch” means that you will change the direction in which you are traveling, without changing the carving method.

- Start walking either inface or outface carving
- Allow the carve to slightly over rotate, to stop the movement (pictures 51 and 52)
- While doing so, switch your arm position to go the opposite way
- Use the momentum of the wind pressure building up to continue in the opposite direction, but using the same carving method



picture 51



picture 52

8.8 Pylons

Setting up human ‘pylons’ in the tunnel is a good drill to practice the previously described transitions and change of direction techniques. (picture 53)



picture 53

8.9 Rotating in place

Another way of transitioning between inface and outface carving is by rotating in place. In itself, it is a simple concept, but the correct foot placement can be tricky in the beginning, especially when performed fast.

- Start walking either inface or outface carving
- Change carving positions by doing a tight 180° turn in the same direction of the carve, as if you would over rotate the carving motion
- Keep traveling in the same direction, but now using the opposite carving method

8.10 Rotating in the direction of movement

The last switch between inface and outface carving is called rotating in the direction of movement. It uses the same technique of pushing back, as the one described under section 8.6. The idea is to do the switch much tighter, without cutting through the tunnel, but keeping the circular motion going.

8.11 Practice drills

Now that you know how to use different transitions to switch between inface and outface, and to switch directions while carving, you can practice all of those in a fluent series of movements.

It is very important for the rest of the Class A Spotter training and your job as a tunnel instructor in general, to become skillful while walking. Don't underestimate the time you should spend practising all the above before moving on.

9. Stability drills

9.1 Range of motion

Range of motion or movement is about the different ways in which we can position or move our bodies in the wind, without getting unstable. These positions or movements will become key when handling flyers.

When learning the ranges of motion it is important to remember how to split the body into an upper and lower half, and how to compensate with one for the positioning of the other, or how to counteract one movement with an opposite movement to keep balanced. While practising these drills, try to find your limits of stability, and how to move within those limits.

For example, leaning backwards creates a forward drive, for which you can compensate by reaching out with one or both arms in front of you. (picture 54)

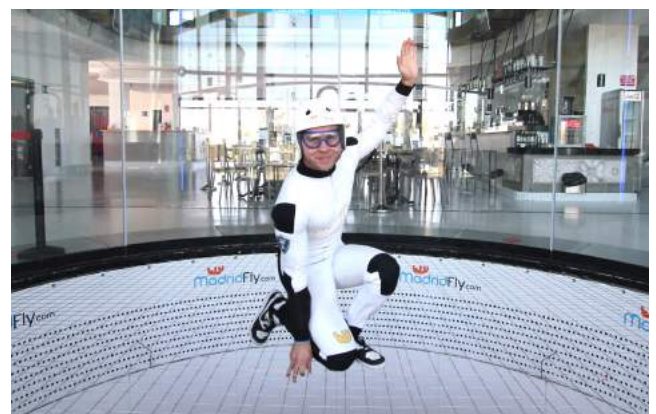


picture 54

9.2 Kneeling to fix the net

To practise ranges of motion can easily be translated into practical tasks, such as kneeling down to fix the net. Checking and preparing the bottom net is part of the daily routine of any tunnel instructor, and while it may appear to be easy, it is an important and quite technical drill you will have to be able to perform quickly and effortlessly, in varying wind speeds.

- Keep your legs together to avoid catching too much wind
- By putting your legs together, you also create a burble for your upper body, allowing it to move freely and perform tasks such as fixing the cables of the net
- Keep your upper body straight when going down to avoid any unwanted drive
- It makes sense to present yourself sideways to the problem area - then simply twist your upper body so you are able to keep it straight and stable in the wind instead of having to bend forward and create unwanted drive with your chest
- You can compensate for your upper body positioning by using only one hand to fix the net, and using your free arm for balance
- Always keep one foot in contact with the net, and place your other knee next to it with a little gap - this allows for a quick recovery into a standing position if needed (picture 55)



picture 55

9.3 Non-contact stability drill

Non-contact stability drills are practiced together with a Trainer (or fellow instructor), acting as a flyer. The idea is to learn how to present your body and compensate for the loss of air caused by the flyer's burble, and how to always provide clean air to the flyer without moving out of place or touching each other. (pictures 56 & 57)

You should be using the wind to provide support and stay in balance. The better your understanding of how to use the wind, the less you use muscle power. In fact, remaining stable should require very little effort. Remember that your pivot point for moving and compensating is around the hips.



picture 56



picture 57

9.4 Contact stability drill

Contact stability drills (as all the following drills and spots in this manual) are also practiced together with a Trainer (or fellow instructor) acting as a flyer. The idea is again to learn how to present your body and compensate for input of the flyer, but this time you will be pushed and pulled by the flyer, testing your limits of stability and clean air awareness. (picture 58)

You should be using the wind to provide support and stay in balance. Again, the better your understanding of how to use the wind, the less you use muscle power. Remaining stable should require relatively little effort.



picture 58

10. Clean air awareness

10.1 Following the flyer

Once your walking skills and stability are strong, you can start following a flyer. You should always stay at the flyer's centre point, which is at his hips. Stay aware of the burble that is created by yourself as well as the flyer while moving around close to each other. This is called 'clean air awareness'.

- Allow the flyer clean air at any time
- Try to stay out of the flyer's burble as well, or compensate for it without touching the flyer
- To keep this clean air, move with a gap of about 1/2 meter between you and the flyer
- This gap should never become more than 1 meter (picture 59)
- Stay vigilant with your foot and leg placement, making sure that you continue to walk in the correct ways



picture 59

10.2 Passing under the flyer centre point

The idea of passing under the flyer is to disrupt the flyer as little as possible and to allow him to fly freely while changing sides. Obviously, you only perform this move when the flyer is above your head height, so you need to pass underneath. During this particular drill, the flyer remains stationary. In real life situations, it is much more likely that the flyer will be moving as described in the following sections.

- Start on one side of the flyer, positioned around his hips
- Pass under the flyer, remaining straight under his centre point at the hips
- Like this, you won't change the pitch of the flyer while you briefly create a burble underneath him, avoiding to disturb his balance
- Face the flyer's knees while you switch sides (picture 60)
- Make sure you end up around the flyer's hips at the other side



picture 60

10.3 Passing under the flyer centre point with movement

This move is performed in the same way as the previous one, but this time the flyer is moving towards you in a side slide.

- Start on the side of the flyer, positioned around his hips
- Follow the flyer's side slide remaining at his hips
- Before you reach the tunnel wall, you need to pass underneath the flyer as previously described



picture 61

10.4 Passing under the flyer supporting the legs

When the flyer is just a little above your head height or even around your shoulder height and you need to perform a side switch, you have to support his body when passing underneath, as the burble you create will be considerably larger.

- Start on one side of the flyer, positioned around his hips
- As the flyer approaches you, support his knee closest to you, but allowing him to continue his movement in the same direction
- Pass the flyer's knees through your hands one at the time while going underneath
- During this move, you should be looking towards the flyer's head (picture 61)
- End up around the flyer's hips at the other side

11. Primary and secondary grips

If the flyer needs “hands on” support, for example to be repositioned in the centre of the tunnel, you use the primary and secondary grips. These allow you to control the flyer’s body position, while minimising the burble you create. Using correct hand placement is very important for safety reasons, but also to avoid awkward situations involving inappropriate touching of (female) flyers. (picture 62)

- Put your arm closest to the flyer’s head underneath and across his waist - not on the chest
- Make sure the flyer’s hip bone is resting in your hand (primary grip)
- With your other hand, support the flyer’s knee closest to you (secondary grip)

When you have repositioned the flyer in the centre of the tunnel using the primary and secondary grips, and the flyer seems stable enough to be released, you can start by releasing your grip at the waist while continuing to support the knee. This allows for clean air, while still assisting the flyer minimally. When the flyer seems to be in control, release the knee grip as well and let the flyer continue unassisted, but stay close to his side.



picture 62

11.1 Moving the flyer to the centre of the tunnel

When the flyer ends up staying close to the tunnel wall and doesn’t seem able to move away without assistance, use the primary and secondary grips to reposition him in the centre of the tunnel.

11.2 Picking the flyer up from the net

When the flyer ends up on the tunnel net and doesn’t seem able to regain an appropriate flying level without assistance, use the primary and secondary grips to reposition him at your hip height, and move him to the centre of the tunnel.

11.3 Flyer moving to the wall

Combine the drill of passing under the flyer with taking the primary and secondary grips, as the flyer might come down due to the burble you create while going underneath. Remember to face the flyer’s legs when you switch sides. After “catching” the flyer, reposition him in the centre of the tunnel.

11.4 Instructor being pushed into the wall

If the flyer is side sliding at your waist level, pushing you towards the wall, you can try to stop his movement by placing your hand at his hip before you get trapped between the wall and the flyer. Use your hand closest to the flyer’s legs for this. (picture 63)



picture 63

If this does not stop the flyer's side slide, you can make a supported switch to his other side and catch him with the primary and secondary grip to reposition him in the centre of the tunnel afterwards. But this time, in stead of supporting the flyer's knees, you support him at the waist.

- While the flyer keeps pushing towards the wall, allow him to gain some height
- Keep contact with the hand you have put at his waist while passing underneath the flyer - remember to face the flyer's legs while switching sides (picture 64)
- Once on the other side, this arm is in the right position to continue with a primary grip at the waist
- With your other hand, support the flyer's knee with a secondary grip
- With the primary and secondary grips in place, you can reposition the flyer away from the wall



picture 64

11.5 Stopping the flyer from rolling over at the wall

When a flyer is moving away from you towards the wall, it is possible he gets unstable at the wall, not being strong with his arms and legs but in stead "collapsing" and threatening to roll over. To prevent this from happening

- React quickly and strongly
- Take the primary grip at the waist
- Place your hand that would normally go to the secondary grip under the knee, on top of the knee in stead
- Lift with your primary grip at the waist, and push the knee down firmly with your secondary grip (picture 65)
- When the flyer returns to a stable belly position, switch your secondary grip to a normal supporting grip under the knee
- Reposition the flyer in the centre of the tunnel



picture 65

12. Controllability

12.1 Hip to hip

Unfortunately, flyers are not always stable enough to use the primary and secondary grips. When a flyer is unstable, you will need a stronger hands-on approach. With a “hip to hip” grip, you have much more control over the flyer and his body position. It does limit the flyer’s ability to fly freely, but it greatly increases his safety.

- Position the flyer with his hip against your hip
- With your hand closest to his head, cup the flyer’s shoulder on your side
- With your other hand, take a firm grip around the flyer’s hip and keep him tightly to your body at waist height - unlike before, your arm now goes on top of the flyer across his back (picture 66)
- With these strong grips, you should be able to deal with virtually any body position while keeping the flyer safe - by pitching your grips you can counteract unwanted drive (picture 67)



picture 66



picture 67

12.2 Hip to hip using hand signals

Most of the time, when a flyer is unstable and needs to be controlled with a hip to hip grip, you will need to correct his body position with the use of hand signals.

- Always keep the firm grip at the hip
- You can increase the control of this grip by “squeezing” the flyer between your upper body and your upper leg while using the hand at the flyer’s shoulder to signal the necessary corrections (picture 68)



picture 68

12.3 Hip to hip using the wall

If the flyer's input is causing a powerful unwanted drive, hard to control while hand signalling corrections, you can carefully position yourself close to the wall with the flyer in controllability, and place one foot against the wall. This helps you counteract the drive before you release the shoulder grip. (picture 69) Always put the leg furthest away from the flyer on the wall.



picture 69

In case the flyer is producing backward drive, you can position the flyer's own feet against the glass to counteract his drive.

12.4 Peeling the flyer off the wall waist height

You will use the hip to hip controllability grips to catch an unstable flyer in certain situations.

An unassisted flyer can get stuck against the wall with a forward drive. Sliding along the wall like this, the speed will increase rapidly, so intercept the flyer as early as possible to prevent this.

- Position yourself ahead of the flyer anticipating his forward drive - like this you give yourself some time to get in the right position and use correct hand placement
- Aim to place the shoulder grip first and start changing the heading of the flyer
- Immediately after, take the hip grip
- As you take the grips, you "peel" the flyer off the wall and reposition him in the centre of the tunnel (picture 70)
- Use hand signals to correct the flyer's body position if needed



picture 70

12.5 Peeling the flyer off the wall descending flyer

This situation is similar to the previous one, but this time the flyer starts the forward drive along the wall above your head height, and comes down in a dive. The spot itself and the hand placement are the same as previously described.

- Follow the flyer along the wall as long as he is too high for you to catch - use the outface carving walk to be quick (picture 71)
- Again, position yourself anticipating the flyer's movement when he comes down in a dive
- Take the shoulder grip and start changing the flyer's heading
- Immediately after, take the hip grip
- As you take the grips, "peel" the flyer off the wall and reposition him in the centre of the tunnel
- Use hand signals to correct the flyer's body position if needed



picture 71

12.6 Peeling the flyer off the wall switch towards the head

In this situation, the flyer starts away from the wall, but suddenly goes up and straightens his legs. This drives him into the wall, where the forward drive continues and ends up in a situation similar to the previously described spot. In case you need to switch sides underneath the flyer when this happens, the switch needs to be made towards the flyer's head, and not towards his feet as you would normally do. (picture 72)

The switch towards the head makes it possible to very quickly get in front of the flyer and anticipate his further movement.

Continue the spot as previously described for a descending flyer.



picture 72

12.7 Hook and block

The “hook” and “block” are techniques used to take control of a moving flyer when taking a grip would be too difficult or too time consuming. They’re most frequently used to stop a flyer from spinning. To stop a flyer who is spinning

- Hook the flyer’s trailing leg at the knee as it passes you, and pull it in towards you
- For this hook, use your hand closest to the direction of the spin
- With your other hand, block the flyer’s upper body at the arm pit as he comes around spinning, and push back
- With this hook and block technique you drive the flyer’s lower and upper body in opposite directions, stopping the spinning motion (picture 73)



picture 73

Be precise with your hand placement! Hooking above or under the knee and blocking on the flyer’s waist or upper arm makes the spot much less powerful and takes away your control.

12.8 Working around the body

A new flyer will most likely be moving around quite a lot, even if he is reasonably stable. To handle a flyer’s small and rather slow drives you can use hooks and blocks on the flyer’s body to correct his heading and keep him on your side.

“Walk” your hands around the flyer’s body, making sure you have at least one point of contact when moving the flyer around.

12.9 Rolling the flyer around - static

When using the controllability grips, the flyer will be in your burble. It is possible that the flyer begins to lean against you and initiates a roll. Sometimes, it is easier to allow the flyer to roll onto his back and then put him into a neutral belly flying position again, instead of counteracting the roll itself.

Rolling the flyer around “static” means that you return the flyer to his original belly position, on your same side.

- Start with the flyer on your side in a hip to hip controllability grip
- As the flyer begins to roll, hook both your arms under the flyer’s shoulders - your elbow joint should be in the flyer’s armpits (picture 74)
- Let the flyer roll onto his back (picture 75)
- Stop the rolling movement, then swing the flyer back into a belly flying position on your same side - lead this swing with your hips to avoid straining your back
- Take a hip to hip grip again and correct the flyer’s position with hand signals if needed, or go to primary and secondary grips if the flyer is stable enough



picture 74

- Swing the flyer back into a belly flying position, but on your other side - lead this swing with your hips to avoid straining your back
- Take a hip to hip grip again, and correct the flyer's position with hand signals if needed, or go to primary and secondary grips if the flyer is stable enough

Remain careful with your hand placement. Keep your hands straight and away from the flyer's chest.



picture 75

12.11 Rolling the flyer around - heading change

This spot is exactly the same as the previous one, but this time you also change your position, turning and following the roll more fluently, using the momentum to bring the flyer back to a neutral belly position on your other side. This means you will not only change the flyer's position, but also his heading.

The move is more fluent than the other two roll rounds, without a deliberate pause when the flyer is on his back. You will use it when the flyer's roll is carrying a lot of momentum or requires a bit more aggression and strength to complete the move.

You will once again need to be very careful with your hand placement. Keep your hands straight as illustrated, and don't place them on the flyer's chest to avoid inappropriate touching of female flyers.

12.10 Rolling the flyer around - changing place

Rolling the flyer around "changing place" means that you continue the roll of the flyer and bring the flyer back to a neutral position, but this time on your other side. So you keep the flyer's heading, but change his place.

- Start with the flyer on your side in a hip to hip controllability grip
- As the flyer begins to roll, hook both your arms under the flyer's shoulders - your elbow joint should be in the flyer's armpits
- Let the flyer roll onto his back

12.12 Pop-up hybrid

You use the pop-up hybrid when the flyer suddenly moves up while you are standing next to him, and the lift happens too fast and powerful to simply block the flyer placing your hand or arm on his back.

- As the flyer pops up, place your hand closest to his feet on his back, around waist height
- When the flyer is about to go over your head, hook your other hand on his other side - both hands should now be hooking around his waist
- This means you have twisted underneath the flyer and are facing his legs (picture 76)
- Be strong and keep a straight body, especially when the drive of the flyer is powerful enough to lift you off the net
- Burbling the flyer at his centre point, pull him back down towards you
- The flyer can end up on either side of you
- Continue with primary and secondary grips, or with a more controlling hip to hip grip if necessary



picture 76

12.13 Descending the flyer with hand signals

If a flyer ends up above your head level and out of your “hands on” reach, you might want to get him back down to a more sensible height, depending on his flying skills. Communicate with the flyer using hand signals (chin up & arch) and allow him to return to your waist height on his own.

- Remain on the side of the flyer and keep eye contact
- Use the correct hand signals for “chin up” and “arch” to remind the flyer of how to come down (picture 77)
- You can say the actual words to go with the hand signals and make your communication more clear - as an instructor, you should be wearing an open face helmet or a helmet with a visor big enough to show your mouth
- Catch the flyer coming down with a primary and secondary grip if needed, don't let him fall on the net



picture 77

12.14 Descending the flyer with a burble

If you are unable to get the flyer down using hand signals, use a burble in stead.

- Step underneath the flyer, but keep watching him
- Push both your arms out in front of you and lean back with your upper body, creating a burble to sink down the flyer (picture 78)
- Always burble the flyer at his centre point around the hips, so you don't pitch his body and make him unstable
- Be aware that your burble will become more effective as the flyer comes down, thus increasing his descending speed
- Step back from underneath the flyer to prevent him from landing on top of you
- Catch the flyer with a primary and secondary grip if needed, don't let him fall on the net



picture 78

If the flyer ends up quite high above you, you can increase the size of your burble - and thereby its effectiveness - by turning 90° underneath the flyer, so you are facing his feet and burbling a larger area of his body. Be extra careful not to make the flyer unstable!

12.15 Cross control

Cross control refers to correcting the flyer's arm and / or leg position by physically moving his extremities in stead of using hand signals. While correcting the flyer, you control him hip to hip, but only with one grip.

To correct the flyer's arms

- Start with the flyer in a hip to hip control grip
- Release the shoulder grip and correct the position of the flyer's arms (picture 79)
- If the flyer is now stable you can continue with a primary and secondary grip, eventually releasing him if possible



picture 79

To correct the flyer's legs

- Start with the flyer in a hip to hip control grip
- To begin with, try changing the flyer's legs by showing him the correct hand signals
- If the flyer is non responsive or unable to perform the necessary corrections by himself, use cross control
- You will have to change your arm that is at the flyer's waist so you can face the flyer's legs

- While making this change, always keep at least one point of contact at the flyer's waist
- You now have your arm closest to the flyer's legs free to make the necessary corrections (picture 80)
- If the flyer becomes stable you can continue with a primary and secondary grip, eventually releasing him if possible



picture 80

If the flyer needs corrections for his legs as well as for his arms, change your hand placement as described above, but always keep at least one point of contact at the waist. This applies for changing between hip to hip and primary and secondary grips as well.

12.16 Instructor on the net

If you get thrown off balance and end up falling down on the net together with your student for whatever reason, always make sure you keep a controlling grip at the flyer's shoulder.

Get on your knees as fast as you can and roll over the flyer.

12.17 In front of the student

If the flyer is reasonably stable, you can position yourself in front of him and control him from there. Communication will be face to face and possibly easier for the flyer to understand. Your main control grips will be

on the flyer's wrist and shoulder of the same arm, with the wrist grip being the secondary one and the shoulder grip the primary one.



picture 81

The primary grip is only to be released when the flyer has settled and is in a stable position. You should always keep the secondary grip while teaching initial movements. (picture 81)

As you are now in a less controlling position, you will have to be prepared for sudden, unexpected and unwanted input from the flyer and react in a proper way to regain control and stability quickly.

If the flyer **goes up** and you can't stop the movement by showing him hand signals

- Retake the primary grip on the shoulder and push down
- As you do this, gently lift the secondary grip
- This helps the flyer to arch more and come down (picture 82)



picture 82

If the flyer suddenly straightens his legs and creates a powerful forward and upward drive, you will have to be quick and use the momentum of this input to regain control in stead of letting the flyer pass on top of you.

- While you have the secondary grip
- Place your primary grip quickly and firmly on the flyer's shoulder (picture 83)
- Pull this primary grip strongly into your chest as the flyer pitches and starts lifting above your head, and take a pivoting step
- Use the momentum of the flyer and continue his drive into a spinning motion, with the arm you have under control being the leading arm - move fast and deliberate
- Using this momentum and at the same time pushing down on the primary shoulder grip will help the flyer to arch and settle down
- Bring the flyer down to the net and decide whether you should change your position back to the side of the flyer in stead of in front to have better control



picture 83

To stop a flyer with **backward** drive, who is not responsive to hand signals

- Retake the primary (and secondary) grip on the flyer's shoulder (and wrist)
- Slowly move towards the wall so the flyer's feet or knees are placed against it
- Try hand signalling again (picture 84)
- If this fails, the switch back to a hip to hip control grip will be easier from here
- Correct the flyer's position with cross control



picture 84

If the flyer is pushing **forwards** and can't be stopped with hand signals

- Retake the primary (and secondary) grip on the flyer's shoulder (and wrist)
- Lock the arm straight as to push back (picture 85)
- Remember that as you straighten the arm of the flyer he might gain some lift - in this case you can push down on the primary grip and raise the secondary grip as described previously



picture 85

You should always use your good judgement before placing yourself in front of the flyer. Although it makes for much clearer communication which might be a big benefit for both flyer and instructor, you should only be teaching from the front if the flyer has shown a stable and predictable position. Until then, remain in the side body position using your hip to hip technique or primary and secondary grips.

13. Student entries and exits

13.1 Normal entry

You will have to assist a new flyer to enter the wind stream safely. Make sure you have checked the flyer's gear properly before doing so and position yourself in the door so there is no way the flyer can enter without you being ready.

With the flyer standing ready in the door

- If needed, remind the flyer to keep his hands to his chest and his chin up
- Take a firm grip on the back of the flyer all the way across, place your hand on his hip furthest away from you and pull him close
- With your other hand, take hold of his wrist nearest to you (picture 86)
- Guide the flyer into the wind by gently pushing him forward, pivoting him around your own hip with tight control
- As soon as the flyer is in the wind, open up his arms to put him in a neutral belly position and prevent forward drive - you can only move the arm you have a hold of but you will have instructed the flyer beforehand to copy this movement with his free arm



picture 86

If the flyer is stable, you can proceed to primary and secondary grips, eventually releasing him if possible.

13.2 In controllability

Be ready to quickly change your grips to hip to hip controllability in case the flyer produces a strong drive or is very unstable right after entering the wind stream. Strong forward drive usually happens when the flyer tightly keeps his hands at his chest after entering and starts straightening his legs.

Quickly change your hand at the flyer's wrist to a firm grip on his shoulder and pitch his chest up to counteract the drive. (picture 87) Use hand signals to correct the flyer's body position before proceeding.



picture 87

13.3 In controllability with help of the wall

In case the forward drive of the flyer after entering the tunnel is very strong, you can use the tunnel wall as previously described in section 13.2.

Place your foot firmly against the wall and use it's support to counteract the drive before releasing the shoulder grip and hand signalling corrections. (picture 88)

Remember to always keep your leg on the flyer's side down on the net, use the other one against the wall for support.



picture 88

13.4 Normal exit

To assist a new flyer exiting the tunnel

- If the flyer is above your waist height, make him come down either using hand signals or a burble
- Take a primary and secondary grip in case the flyer is stable and without any unwanted drive, but place the hand at the flyer's knee on top of the knee and not underneath
- Assist the flyer to the door but wait for him to take a firm hold of the door frame with both his hands for support (picture 89)
- Push down the flyer's knee to help him into a standing position, while supporting him around the waist



picture 89

13.5 Back sliding

It can happen that the flyer starts back sliding away from the door, usually caused by reaching out for the door frame too early. To assist the flyer in case he has an unwanted backward drive

- Take a hip to hip controllability grip with one hand at the hip and one hand on the shoulder
- In stead of using much muscle power trying to pitch the body of the flyer chest down or waste time trying to correct him with hand signals, you can use the momentum of the back slide to turn the flyer 360° while moving towards the door
- Always turn to the side you are on for good control and fluency
- Again, wait for the flyer to take a firm hold of the door frame with both his hands for support
- When the flyer has grabbed the door, you can switch to primary and secondary grips
- Push down the flyer's knee to help him into a standing position, while supporting him around the waist

14. Recovering the flyer

14.1 Recovering the flyer from his back

There are two methods to roll a flyer onto his belly should he end up on his back for some reason. You either roll the flyer away from you, or towards you. When the flyer is positioned on the net, you have to roll him towards you. If the flyer is airborne, you roll him away from you. Rolling the flyer towards you when he is on the net will be discussed in section 14.3.

When the flyer ends up on his back while airborne, you will hopefully have caught him using one of the back spots described in section 15. You will have one arm across the flyer's back at his waist, the other one at his shoulder blades. To roll the flyer away from you, back onto his belly

- Place your hand closest to the flyer's head onto his shoulder furthest away, hook around the shoulder so your hand is between the flyer's neck and upper arm
- Place your other hand on top of the flyer's knee furthest away from you, but reach from underneath the flyer's other leg, so your arm is "woven" in between his legs (picture 90)
- To initiate the roll, pull the flyer's knee in under his body
- At the same time, slightly pull in the shoulder grip to keep the flyer in place
- With the flyer now on his belly, continue with primary and secondary grips, or with hip to hip control if needed



picture 90

14.2 Recovering the flyer from a kneeling position

To help yourself while rolling the flyer away from you onto his belly, you can gently lower him onto your knee for support (use your knee closest to the flyer's legs), and then continue the roll as previously described in section 14.1. (picture 91)



picture 91

14.3 Back tracking through the centre

Sometimes a flyer will roll over on his back and then try to correct himself but will actually just end up making things worse, often in the form of tracking on his back on net. You will first have to stop the track, settle down the flyer and eventually proceed with rolling him over onto his belly.

To stop the flyer while he is tracking on his back

- Get ahead of the flyer and hook your foot on his shoulder to stop the track, be careful to aim right and not kick the flyer in the head (picture 92)
- The flyer will now rotate around your leg
- Be strong with your foot placement and stay aware of the flyer's burble
- Once you have the flyer hooked, he can arch or straighten his legs as much as he wants but will not move much
- Bend the flyer's legs as soon as you can to stop any unwanted drive, then roll him over
- This time, the roll will be towards you



picture 92

To roll the flyer towards you

- Stay on the side of the flyer
- Adjust the flyer's arms and legs so there is no drive in any direction
- If the flyer ended up on his back due to a fall, check if he is ok before proceeding
- It's a good idea to signal that you will be rolling the flyer onto his belly before doing so, that way he can be cooperative
- Place your hand that is closest to the flyer's head on the flyer's torso, on the side of his body which is furthest away from you - your grip should be as close as possible to the flyer's arm pit and you should approach from below the flyer's arm so your own arm won't get "locked" during the roll over
- With your other hand take a grip on the flyer's leg furthest away, around his knee
- Roll the flyer towards you
- Always be prepared for the flyer to lift off the net or produce unwanted drive when you roll him over, as he most likely will have given up the arching position
- Pick up the flyer from the net and continue with primary and secondary grips, or with hip to hip control if needed

14.4 Back tracking against the wall

If the flyer is back tracking while sliding against the wall, you have to stop him in a similar way as described above, by hooking your foot at his shoulder. Again, be quick and deliberate, but careful not to kick the flyer in the head. (picture 93)

Proceed as described previously and roll the flyer towards you.



picture 93

15. Back spots

Now that you know how to recover a flyer from an unwanted back position onto his belly, you can apply this after performing the actual back spots, as described in the following sections.

15.1 In the middle of the tunnel

If the flyer rolls over onto his back above your head height, be ready for him to come down and even pick up speed on his way.

- You should be positioned at the side of the flyer
- Aim for the flyer to land in your arms, which you put out in front of you, but with your elbows still close to your body as you catch the weight - if you reach out too far, you put a lot of strain on your back and you lose a lot of the strength of your grip
- At the same time, be careful not to get underneath the flyer, you will burble him and make him come down even faster
- As the flyer lands, you should have one arm across his back around his waist, and the other one around the shoulder blades (picture 94)
- Be careful with your hand positioning and avoid awkward situations. Make sure you don't put the arm that is supposed to be around the waist too close to the flyer's rear end
- Roll the flyer away from you onto his belly, as described in section 14.1



picture 94

15.2 Against the wall

If the flyer rolls over at the wall and comes down sliding along the wall, perform the spot as described above. (picture 95)

This time, you will have to move away from the wall before turning over the flyer.



picture 95

15.3 Backward drive

If the flyer rolls over onto his back, and comes down with a backward drive, you will have to position yourself in the tunnel anticipating the flyer's movement while coming down. Be slightly ahead of the flyer's head end, but still closely on his side. (picture 96)

Be prepared for some continued backward drive as you catch the weight. Perform the rest of the spot as described in section 15.1.



picture 96

15.4 Forward drive

If the flyer rolls over onto his back, and comes down with a forward drive, you will have to position yourself in the tunnel anticipating the flyer's movement while coming down. Be slightly ahead of the flyer's feet end, but still closely on his side. (picture 97)

Be prepared for some continued forward drive as you catch the weight. Perform the rest of the spot as described in section 15.1.



picture 97

15.5 Spinning

If the flyer comes down on his back with a spinning motion, follow his movement using an inface carving walk to stay at his side until he reaches an appropriate height for you to perform the spot. (picture 98)

Perform the rest of the spot as described in section 15.1.



picture 98

16. Stand-up spots

16.1 Flyer standing up on the net

If the flyer pulls his legs in underneath or gets unstable and tries to stand up

- Be quick to control the flyer around his waist, put both your arms around the flyer
- If the flyer is standing up close to the wall, back him up until he is with his back against the wall and use the wall for support and control - with the wall behind him and you in front, there is not many places the flyer can go (picture 99)
- In case the flyer stands up in the middle of the tunnel, don't back him up but keep firm control of the flyer at his hips and give him a little time to settle in the wind
- Bring the flyer's hands in to his chest and tell him to put his chin up
- Place your hands as if you would take in the flyer from the door and proceed exactly in the same way as described in section 13.1.



picture 99

16.2 Hips to the centre

It can happen that the flyer puts his feet on the wall and continues going up with the rest of his body, ending up in a stand-up position on the wall. This often happens when the

flyer is learning to fly up, or if he flies up unintentionally with a backward drive. Try to get the flyer to return to a belly flying position using hand signals (chin up & arch). If this fails, be ready for the flyer to come down along the wall in a stand-up position.

If the flyer comes straight down with his hips facing the centre of the tunnel

- The flyer's legs will at least be shoulder width apart
- Position yourself between the flyer's legs, with the backside of your lower arms against the wall, keep your hands flat
- You can put one hand slightly on top of the other to reinforce your grip
- As the flyer comes down, his legs will be on either side of your arms (picture 100)
- When you catch the flyer, push him against the wall and stop the downward movement
- Once settled, move the flyer down the wall and onto the net on his back.



picture 100

- Bend the flyer's legs to prevent any drive and position yourself on his side while keeping control of his body at all times
- Roll the flyer towards you back onto his belly

To perform this spot you need to be confident and strong. If you only half commit, you may not only cause injury to the flyer but also to yourself.

16.3 Hips angled

In this situation, the flyer comes down in a standing position but with his hips angled in stead of pointing to the centre of the tunnel. This means he will not come straight down, but will deviate to the side. To spot this correctly, you have to assess which angle the hips are at. The quickest way to do so is by looking at the feet. If the flyer's feet are pointing to the left, his hips are angled to the left and vice versa. The angle of the hips will predict the direction of the flyer's drive.

- As the flyer won't be coming straight down, anticipate his drive depending on the angle of his hips but stay in front of the flyer
- If the flyer's hips are pointing to your left side, "sweep" his legs from underneath him and off the wall with your left arm, making sure you sweep below the knee
- This changes his position from standing up to being on his back
- With your other arm, catch the flyer across his back around the shoulder blades - be careful not to place your arm too low on the flyer's back as you have to be able to firmly stop the rotation you caused by sweeping the legs (picture 101)
- Place your sweeping arm across the flyer's back around the waist
- Move the flyer away from the wall to the centre of the tunnel
- Roll the flyer away from you onto his belly again

You need a good, deliberate sweep to take the flyer off the wall. Be fast and strong.



picture 101

17. Head down spots

17.1 Rolling on the wall

This situation starts in a similar way as described in section 12.5, where the flyer has a forward drive along the wall. But this time, he rolls over and comes down head first.

You start the spot in a similar way as “peeling the flyer off the wall”, but the catch itself will be different.

- Follow the flyer along the wall as long as he is too high for you to catch - use the outface carving walk to be quick
- Position yourself anticipating the flyer’s movement when he comes down in a dive
- Place your arm close to the flyer against the wall, aiming for the flyer’s shoulder closest to you to land in your elbow joint (picture 102)
- It is very important to be strong with this arm and prevent the flyer from hitting the net with his head



picture 102

- As the flyer lands in your arm, move his head away from the wall and take a controlling grip with your other arm across the flyer’s waist
- You end up with a hip to hip controllability grip, but with the flyer on his back (picture 103)

- Move the flyer away from the wall to the centre of the tunnel
- Once settled, change your arm position to roll the flyer away from you onto his belly



picture 103

Again, be strong and commit to the catch to prevent injury to both the flyer and yourself.

17.2 Coming off the wall

It can happen that the flyer puts his hands on the wall and continues going up with the rest of his body, ending up in a head down position against the wall. This might happen when the flyer is going up with forward drive, and instead of pushing off on the wall, looks down (possibly to make eye contact with the instructor) which flips him onto his head.

If the momentum of this flip carries through, the flyer will end up on his back and will most likely come down with continued backwards drive towards the centre of the tunnel. (picture 104)

- To spot the flyer, position yourself anticipating his movement and catch him as described in section 15.3.
- Be prepared for some continued backward drive as you catch the weight
- Roll the flyer away from you onto his belly



picture 104

17.3 Coming down the wall inface

This situation usually starts in a similar way as described before, but this time, the flyer comes straight down along the wall. To spot this correctly

- Place the backside of your lower arms against the wall, no more than shoulder width apart
- Keep your hands flat against the wall, and place one on top of the other to reinforce your grip
- The flyer's head should go between your arms as his shoulders land in your elbow joints (picture 105)



picture 105

- As the flyer lands in your arms, push him into the wall to increase the strength of the spot
- Absorb the impact with your legs
- Once settled, back up towards the centre of the tunnel and let the flyer slide onto his back
- Change to hip to hip control with the flyer on his back
- Roll the flyer away from you onto his belly

17.4 Coming down the wall outface

Although this spot might be rather rare, it can happen when the flyer is on his back and moves towards the wall head first. Putting his hands on the wall would make the rest of his body continue upwards, flipping him onto his head. This time, the flyer also comes down head first, but facing the wall.

The actual spot is exactly the same as described above for the flyer coming down inface. But this time, as you back away from the wall after catching the flyer, the flyer will end up on his belly straight away. (pictures 106 & 107)



picture 106



picture 107

17.5 Static

Should the flyer end up in a static head down position in the centre of the tunnel after getting unstable, you will use the exact same hand placement and recovery as described above for a flyer coming down along the wall inface. (picture 108)



picture 108

17.6 Back flip in the middle of the tunnel

In this situation, the flyer transitions unintentionally from a back flying position onto his belly, traveling over his head. This move is a dynamic one and requires you to have a good understanding of the flyer's positions. The sooner you recognise the situation and its outcome, the easier the spot becomes.

- Catch the flyer's chest by putting your arm across the middle of it (picture 109)
- When the flyer is vertical, place your other arm across his back, hooking the flyer's armpit from behind and letting your hands meet on the flyer's chest
- Allow the flyer's move to continue, but keep your arms strong and controlling to handle the forward drive
- Squeeze your arms together in a vice-like grip (picture 110)
- Once the flyer is settled on his belly, change your grips to primary and secondary or hip to hip if needed



picture 109



picture 110

17.7 Front flip in the middle of the tunnel

In this situation, the flyer transitions unintentionally from his belly to his back, traveling over his head. The spot is performed in the same way as described above, but with an opposite order of hand placement.

- Catch the flyer's back by putting your arm across the middle of it (picture 111)
- When the flyer is vertical, place your other arm across his chest, again hooking over the flyer's armpit and joining your hands on the flyer's back
- Allow the flyer's move to continue, but keep your arms strong and controlling to handle the backward drive
- Squeeze your arms together in a vice-like grip (picture 112)
- Once the flyer is settled, change your grips to hip to hip with the flyer on his back
- Roll the flyer away from you onto his belly
- Continue with primary and secondary grips or with a controlling hip to hip grip if needed



picture 111

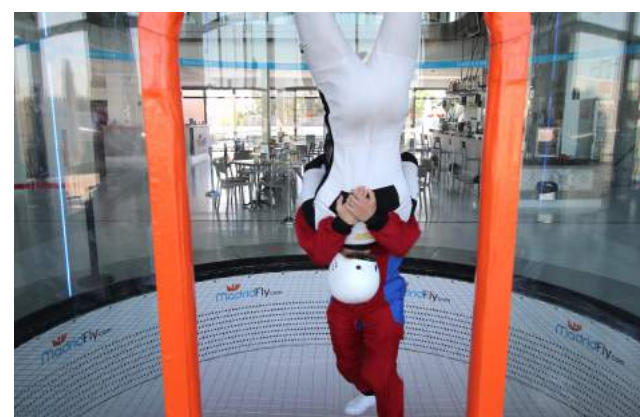
With the flyer now on his belly, assist him to exit the tunnel as described in section 13.4.



picture 113



picture 112



picture 114

17.8 Head down exit

A flyer going head down in the door most likely happens when the flyer wants to exit the wind stream, but has approached the door too high. It is a scary situation, as there is little to no wind to support the flyer, meaning he will fall much quicker compared with coming down the wall.

- The actual spot is exactly the same as described in section 17.3 for a flyer coming straight down the wall inface (picture 113)
- Reposition the flyer away from the door as soon as possible - you can use the static head down position as described in 17.5 to quickly turn the flyer away from the door and back up a couple of steps (picture 114)
- Once settled, let the flyer transition onto his back, firmly keeping your grips
- Change to hip to hip control with the flyer on his back
- Roll the flyer away from you onto his belly

18. Mix-up

So far, this manual has covered all the common situations you might find yourself in while handling first-time flyers. Obviously, you will spend time practising every move by itself, perfecting your spotting technique and getting used to be fast and deliberate in your moves.

But spots rarely happen in the isolated situations as described so far.

To work as a tunnel instructor requires stamina and you will have to be able to deal with multiple situations occurring in one session. When you are teaching a whole class of first-time flyers, there might be more than one giving you a hard time too. If you spend all your energy on one flyer who is hard to handle, you will be in trouble for the rest of the time you have to spend in the wind, compromising the safety of your customers as well as your own. And that - of course - is unacceptable.

The “Mix-up” exercise is a good tool to measure if you are ready to do the job. Your Trainer or Examiner will be throwing spots at you between 5 and 10 minutes straight. If you get through this time period without getting slow and sloppy, you are fit for future fight!

19. Skydivers

As a tunnel instructor, you will not only be working with first-time flyers. A big part of the tunnel's regular customers are skydivers (or return flyers). You have to be prepared to spot them as well, even if you expect them to be able to fly in all the basic positions. The tunnel presents skydivers with quite a different environment compared to the sky. Always talk with visiting skydivers about their experience both in the sky and in the tunnel, so you have a rough idea about what to expect. Treat AFF students and skydivers without tunnel experience as first-time flyers until you have properly assessed their skills.

Often, you will have to divide your attention towards multiple flyers at the same time. Never allow yourself to be caught off guard!

19.1 Normal entry

Entering a wind tunnel is very different from exiting an airplane. If a skydiver is not used to tunnel flying

- Position yourself at the door in a way that makes it impossible for the skydiver to enter without you being ready
- If you think it's needed, remind the skydiver of keeping his chin up and arching while entering
- Assist new tunnel flyers like first-time flyers, optionally going straight to primary and secondary grips (picture 115)
- If the flyer is stable, release your grips



picture 115

19.2 Assisted entry

If an unassisted flyer forgets to arch or is looking down while entering the tunnel, he might be pushed back or struggle to get inside the wind stream.

- Assist the flyer with a primary grip around his waist
- Take a secondary grip on his back and push him forwards into the wind (picture 116)
- Change your secondary grip to its normal position underneath the knee to help with the pitch if needed
- Once the flyer is settled and stable, you can release your grips



picture 116

19.3 Forward drive entry

If the flyer enters the tunnel with a lot of forward drive, be ready to catch his leg at the knee to control his movement and prevent him from flying into the tunnel wall on the other side. (picture 117)



picture 117

19.4 Flyer jumping up

If the flyer is jumping up in the door and gets pushed back by the wind

- Take a grip with both your hands around the flyer's waist
- Pull the flyer down again (picture 118)
- Assist the flyer while entering the tunnel



picture 118

19.5 Popping up in the door frame

If the flyer is jumping up in the door and continues the upward drive

- Position yourself in front of the flyer and take firm grips on both his legs, as close to his waist as possible (picture 119)
- Your burble will bring the flyer down
- As the flyer comes down, support him with a primary grip around his waist and either push him out of the wind to start over again, or continue assisting the flyer into the tunnel with a primary and secondary grip



picture 119

19.6 Flyer not prepared

Always check if the flyer is geared up properly before entering the tunnel. Helmet, zippers, goggles... should all be in place and firmly attached. The flyer should not be wearing any loose items either.

19.7 Instructor between flyers

If skydivers want to fly together in the tunnel, you have to first of all assess if their skill level is high enough to do so safely. Only allow one flyer at a time to enter the tunnel.

- As the first flyer enters, block the door for the following flyer to make sure the first entry is uneventful
- Allow the first flyer time to settle - well away from the door to give the next flyer enough space to enter
- Assist the following flyer(s) if needed
- Stay in between the flyers in the beginning so you can quickly assist either one of them if needed
- If the flyers seem reasonably stable you can pull out and spot from the door

19.8 Recovering unstable flyer

If one of the flyers gets unstable and ends up on his back on the net while flying together with others

- Make sure you control the unstable flyer straight away, adjust his arms and legs to stop any unwanted drive
- Signal to the other flyer(s) to take a distance and stay close to the net
- Roll over the unstable flyer and pick him up from the net

In case two flyers get unstable at the same time, you will have to decide which spot is potentially most dangerous for the flyer and focus on that one. Then recover the other flyer if still needed. This means that, if one flyer is about to go head down in the door while the other goes on his back, you spot the head down first. If this situation occurs, the flyers should probably not be sharing time.

19.9 Recovering flyer whilst obstructed

If one of the flyers gets unstable while another flyer blocks your path, be quick to move the flyer out of your way to get to the unstable one. Use a primary and secondary grip to do so. (picture 120)



picture 120

19.10 Protecting unstable flyer

To protect a flyer who got unstable and ended on his back from another flyer who is having difficulties to control his movements, shelter the one on the net with your body while at the same time controlling his position and prevent unwanted drive.

- If the other flyer gets above you both and catches your burble, he might come down on top of you both
- Place your arm furthest away from the wall above your head and against the wall
- Like this, you make a sliding ramp with your body for the other flyer, protecting the unstable one (picture 121)



picture 121

19.14 Head down exit

If the flyer approaches the door too high, he might end up in a head down position above the door. Proceed exactly as described in section 17.8.

Again, if this situation occurs, the flyers should probably not be sharing time.

19.11 Controlling flyers

You are responsible for the flyers' safety at all times. This includes reminding them to stay on the same level, or asking them to come down if they continuously find themselves in the upper half of the tunnel.

If there is any dispute between the flyers, step up and take control of inappropriate behaviour.

19.12 Normal exit

When a skydiver has to exit the tunnel, be ready at the door to assist if needed. If multiple flyers have to exit, allow only one at a time to do so.

19.13 Assisted exit

If the flyer needs assistance exiting the tunnel, use a primary and secondary grip and proceed as described in section 13.4.



Class A+ Spotter

To watch the video visit the website at <http://www.tunnelinstructor.org>
or the Facebook page at www.facebook.com/Tunnelinstructor

20. Introduction

Flying with flyers or “taxi flying” is an advanced teaching and student handling technique. Before even considering to fly with a flyer, you have to understand your own abilities and be aware of your own limitations.

On top of that, you need to assess the flyer’s abilities. It is important that he has a stable and controlled body position, reducing the risk of incidents while flying together. Also, if the flyer needs wind speeds that are too high for you to fly comfortably in a belly position while controlling the other person, you should not attempt taxi flying.

Basically, there are 3 main rules for flying with flyers:

NEVER release the upper shoulder grip

NEVER get above the flyer

NEVER attempt taxi flying if you don’t feel it can be performed in a safe way

This manual starts by describing the solo drills you have to train and be able to perform without any problems before attempting to become a Class A+ Spotter.

All the following drills that include another flyer will have to be practiced with a Trainer before you perform any of them with a real customer.

Only when you are signed off as a competent Class A+ Spotter by a qualified person to do so, you can include taxi flying in your job description, depending on the tunnel’s individual policy about such. Taxi flying is not a prerequisite for satisfying

customer service, and the offering of it is optional.

21. Solo drills

Before you start training to become a “taxi flyer” you must display a good level of belly flying skills. The list below shows the solo drills you should practice and be able to perform without effort, before considering further training.

- Belly to stand, and stand to belly
- Knee to net drills, alternating legs
- Descending knee drills, alternating legs
- Descending knee drills, both knees together
- Knee turns and side slides
- Wall kick drills
- Stand-ups on the wall, either side
- Walking on the wall
- Forwards and backwards, alternative methods

Each of the above mentioned moves is illustrated with pictures on the following pages. To get a better idea of what is meant exactly please view the instructional video for becoming a Class A+ Spotter, available on the Organisation’s website or Facebook page.

Belly to stand



picture 122

Knee to net



picture 123

Descending, alternate knees



picture 124

Descending, knees together



picture 125

Side slide



picture 126

Wall kick



picture 127

Stand up on wall



picture 128

Walking on wall



picture 129

Backwards, alternative



picture 130

All the solo drills as shown above will be used while taxi flying. You should be confident and strong in all your moves and capable of performing the alternative ways of creating forward and backward drive as well, as these methods create a stronger input than the classic way.

22. Flying with flyers

Once you can perform all the above without any problems, you can start working towards flying with a flyer. All the following should be practiced and sufficiently mastered with a Trainer before attempting any of the moves with a real customer.



picture 131

22.1 Upper and lower grips

Remember to NEVER get above the flyer while taxi flying. This could potentially be very dangerous for both parties.

Also, NEVER release the upper shoulder grip.

Ideally, the student suit that the flyer will be wearing has grips on both shoulders. Grab a firm hold of the shoulder grip closest to you, preferably even twisting it before grabbing it, as to tighten the suit around the flyer, and improve the control you can exert with it.

If the flyer's suit does not have grips, or if there is not enough fabric to twist into a grip-like hold, it is better not to attempt the taxi flying.

With your other hand, take a grip on the flyer's knee. Make sure you take hold of the fabric on the inside of the knee so you can control the flyer's leg. Don't just grab hold of the suit on the outside of the leg. If the suit is baggy, it will move around when you handle the grip, reducing the amount of actual control you have over the flyer's body position. (picture 131)

22.2 Stand to belly drills while controlling the flyer

The first thing to practise is going from a standing position to a belly flying position and back, while controlling the flyer with the before mentioned upper and lower grips. You should focus on maintaining level and heading throughout the exercise. (picture 132)



picture 132

22.3 Controlling the flyer up and down

During these movements, the input for going up and down with the flyer will come from you, while the flyer's body position remains unchanged.

Use the known techniques of expanding or reducing your body surface in order to create lift or go down. (pictures 133 & 134) Practice the different knee drills for going down.

It's important to keep the flyer close to you while going down, as you want him to stay on your level, and not end up above you. So pull in a little on your grips.

Flying up



picture 133

Flying down



picture 134

22.4 Controlling the flyer's side slide

In case the flyer is not in a perfect box position but is causing a side sliding movement, you have to counteract his drive by adapting your own body position.

If the flyer is sliding towards you

- Keep your upper and lower grips firm
- Extend your legs to produce forward drive, compensating for the flyer's side slide
- Make sure your input is just enough to counteract the side slide and thus stay in place (picture 135)



picture 135

If the flyer is sliding away from you

- Keep your upper and lower grips firm
- Bend your legs to produce backward drive, compensating for the flyer's side slide
- Make sure your input is just enough to counteract the side slide and thus stay in place
- Pull in a little on your grips to keep the flyer close to you as you will be producing drive away from the flyer
- Practice the alternate leg position for flying backwards as well, it is more powerful than the classic leg position (picture 136)



picture 136



picture 137

22.5 Controlling the flyer forwards and backwards

The flyer's forward and backward movement is perpendicular to your own forward and backward movement. To counteract his drive, you would have to side slide. In general, the classic way of performing a side slide is not strong enough to counteract the flyer's possibly powerful drive. Therefore, adjust your body position as explained below to make your control adequate.

If the flyer is moving forwards

- Keep your upper and lower grips firm and pull them in a little to keep the flyer close to you
- Be strong with the shoulder grip especially
- Put your leg that is closest to the flyer's head out to the side, parallel to the flyer's body, and push firmly with it as to create a drive opposite to the flyer's forward drive
- Your other leg is used for balance and level control (picture 137)
- With your grips, you can also pitch the flyer's body position to create opposite drive

If the flyer is moving backwards

- Keep your upper and lower grips firm and pull them in a little to keep the flyer close to you
- Be strong with the shoulder grip especially
- Put your leg that is closest to the flyer's legs out to the side, parallel to the flyer's body, and push firmly with it as to create a drive opposite to the flyer's backward drive
- Your other leg is used for balance and level control (picture 138)
- With your grips, you can also pitch the flyer's body position to create opposite drive



picture 138

22.6 Going up and down with the flyer by changing his body position as well as your own

On top of adjusting your own body position to gain or lose lift, you can adjust the flyer's body position as well. Obviously, the same principles of increasing and decreasing surface area apply.

To fly up

- Keep your upper and lower grips firm
- Move your grips further away from each other, so you extend the flyer's body and create a larger surface
- You can use the lower part of your arms to push the flyer's arm and leg out (picture 139)
- The change of the flyer's position together with your own input will make the movement more deliberate



picture 139

To fly down

- Keep your upper and lower grips firm
- Bring your grips closer together, so you make the flyer arch and reduce his surface (picture 140)
- The change of the flyer's position together with your own input will make the movement more deliberate



picture 140

22.7 Use flyer's momentum to avoid strike

In case the flyer suddenly changes his body position in a way that creates a powerful input, you have to learn how to control the drive that is hereby created, in order to avoid potentially harming wall strikes.

For example

- If the flyer goes into a steep track, continue his momentum into a turning motion to avoid hitting the wall (picture 141)
- Keep your upper and lower grips firm, be especially strong with the shoulder grip to induce the turning motion
- Bring your grips closer together to make the flyer arch and return to a neutral position



picture 141

If you feel that you can not control the flyer's body position and movement, you should return to the net as soon and safe as possible and take a controlling hip to hip grip.

22.8 Stand-ups on the wall with a rolling flyer

If the flyer drives you towards the wall with a side sliding movement and threatens to roll further onto his back

- Stop the flyer's drive by putting both your feet on the wall behind you
- Keep your upper and lower grips firm
- Push down with your upper body to prevent the flyer from rolling over
- By placing your shoulder on his hip, you can force him into arching and returning to a stable belly flying position (picture 142)
- Fly the flyer away from the wall or return to the net to take a controlling hip to hip grip



picture 142

22.9 Wall kick drills with a flyer

You can place your feet on the walls to stop the flyer's forward or backward movement, and counteract his input by pushing off in the opposite direction. (pictures 143 and 144)

With your grips, you can pitch the flyer's body position to help avoid a wall strike.



picture 143



picture 144

23. Spots

Unfortunately, there is always the possibility that the flyer can not be recovered in the ways described above. A flyer who suddenly buckles or twists and threatens to get out of your control while taxi flying might have to be recovered by performing one of the following spots, so you can safely get him down to the net and continue with a controlling hip to hip grip to correct his body position. If spots like these happen, you should probably refrain from further taxi flying with this person.



picture 145

23.1 Pushing the flyer to his back through the legs

If the flyer suddenly and strongly bends at the hips and knees, or goes into a powerful backward movement that puts you in a situation which is hard to control while taxi flying

- Throw the flyer's legs down so they pass underneath his body, putting the flyer on his back (picture 145)
- As you do this, release the leg grip, but keep firm control with the shoulder grip
- With your free hand, hook under the flyer's free shoulder, so you now have two points of contact
- Carefully fly the flyer down to the net
- Fly a wide knee or sit flying position so you end up standing on the net, preventing the flyer from touching the net as you come down rather fast
- Roll the flyer onto his belly and take a controlling hip to hip grip
- Correct the flyer's body position from here if needed

23.2 Pushing the flyer to his back over the head

If the flyer suddenly and strongly bends at the hips with his head pointing down, threatening to go into a steep track which is hard to control while taxi flying

- Throw the flyer's legs over his head, in a front flip motion, putting the flyer on his back (picture 146)
- As you do this, release the leg grip but keep firm control with the shoulder grip
- With your free hand, hook under the flyer's free shoulder, so you now have two points of contact
- Carefully fly the flyer down to the net
- Fly a wide knee or sit flying position so you end up standing on the net, preventing the flyer from touching the net as you come down rather fast
- Roll the flyer onto his belly and take a controlling hip to hip grip
- Correct the flyer's body position from here if needed



picture 146

23.3 Saving an out of control spin by rolling the flyer onto his back

If the flyer ends up spinning out of control

- Push the flyer's legs out and away from you, so they continue in a spinning motion
- At the same time, pull the shoulder grip tight
- As the flyer's legs continue around while his shoulder is kept in place, the flyer will end up on his back (picture 147)
- With your free hand, hook under the flyer's free shoulder, so you now have two points of contact
- Carefully fly the flyer down to the net
- Fly a wide knee or sit flying position so you end up standing on the net, preventing the flyer from touching the net as you come down rather fast
- Roll the flyer onto his belly and take a controlling hip to hip grip
- Correct the flyer's body position from here if needed



picture 147

24. Mix-up

Train all possible scenarios in mix-up sessions, to make sure your skills are solid and you are well prepared to handle taxi flying with real costumers. You will have to be tested and certified as a “Class A+ Spotter” by a qualified Examiner before you can add taxi flying to your job description.

It should go without saying that taxi flying imposes a considerable risk on both flyer and instructor should things go wrong. Take your time and assess the skills needed when you start taxi flying with real customers. It’s a good idea to begin with reasonably stable flyers, preferably close to your own weight and height, before you move on to more “challenging” ones.

It is recommend to start taxi flying together with an experienced Class A+ Spotter on the other side of the flyer for about 300-400 taxi flights. Keep your flying slow and careful and stay under 5 meters for your first solo taxi flights.

When you’ve flown with about 200 customers by yourself, you can probably start to increase your altitude and speed of movement, but always remember that not everybody likes it fast and furious. Check how your customers feel about fast spinning roller coaster rides.

Being a rated Class A+ Spotter does NOT mean you now HAVE to fly with all your customers. Use your common sense and stay safe at all times.



Class B Flyer - Static

To watch the video visit the website at www.tunnelinstructor.org
or the facebook page at www.facebook.com/Tunnelinstructor

25. Sit Flying

Head up flying or sit flying is one of the key positions in freefly. This section will cover the basic mechanics of the head up orientation. As you will be flying on higher wind speeds, remember to ALWAYS recover on your back and not on your belly when you become unstable.

25.1 Neutral

The principle of sit flying is quite similar to that of back flying. The neutral position is much the same, apart from your actual orientation and arm positioning. In back flying, our arms are above our head, whereas with sit flying, the arms are in a box position at shoulder height.

- Keep your hips bent 90° - as with back flying, this helps to prevent any unwanted movement or lift
- Push out your chest
- Keep your chin back, but try to avoid looking up or tucking your chin to your chest, your head should be on level
- Your knees should be bent, but your feet should be out from under your legs to avoid burbling
- For stability, you should have your knees slightly closer together than your feet, this also helps with gaining lift
- Your feet should not be pointed, in fact, your toes should be brought up towards your knees, this will help prevent any unwanted drive (picture 148)



picture 148

25.2 Entrance

Once you know how to remain stable in a neutral sit flying position, you can start entering the wind stream in this orientation.

- Stand in the door with your hands on your chest
- Begin to lean forward and push your head, chest and arms into the wind (picture 149)
- As your upper body enters the wind stream, open your arms to the neutral flying position and gently push off with both feet
- Make sure that your hips and knees are brought up to the neutral position straight away
- Once settled in the neutral position, move away from the door and to the centre of the tunnel



picture 149

25.3 Forwards

The best way to learn movement while sit flying is to start with small drives and work on reliably countering them before you work up to big and fast movement. To understand fully how inputs work and to feel their effects completely, keep your movements slow and deliberate to begin with. Being able to stop the momentum smoothly demonstrates true control.

Moving forwards in sit fly can be related to the basics of belly flight. This applies for most positions. Your legs make up about half of your body's surface area and therefore contain a lot of power that you can tap into to create movement. To move forwards while sit flying

- Keep your thighs parallel to the bottom net, and straighten your legs from the knee down (i.e. drive your heels forward), this will be enough to produce the drive needed
- To increase the effectiveness of the forward drive, lean your upper body back onto the wind (picture 150)
- Your legs need to be strong, along with your core and hips - the increased strength in these areas will prevent you from becoming unstable



picture 150

25.4 Backwards

Moving backwards, much like moving forwards, can be related to belly flying. Again, working with your legs will produce the drive needed, and effectiveness can be increased by using your upper body as well. To move backwards in sit fly

- Widen your knees a little, and bend your legs at the knees slightly
- Working with your legs will produce enough drive to cause backward movement, but it becomes more effective when you lean forward and present your chest to the wind
- Working with your chest will not only aid in producing a more stable and controlled drive backwards, it will also help you maintain the height throughout the move
- Keep your knees wide to allow the air to flow unobstructed to your chest.(picture 151)
- You can press your arms forward slightly to aid with the drive
- Again, some extra strength in the hips and core is important to prevent you from becoming unstable



picture 151

25.5 Forwards & backwards

Moving forwards and backwards without stopping uses the same methods as described above. However, as the two movements are to be linked fluently, the idea is to pivot around the hip allowing first the upper body to lean back onto the wind and then forwards. There should be a point of transition between the two movements. This point should be in the centre of the tunnel to prevent you from flying into the wall.

25.6 Turning 360°

There are two major ways of turning - using your arms and using your legs. Although your arms can be effective, your goal should eventually be to let your legs do most of the work. Turning with your legs will take very little effort since they have a lot of surface area, but this technique is a little harder to learn. In the beginning, changing the position of your legs might cause instability.

To turn using your arms

- Maintain a neutral upper body position
- Move your forearms like teeter-totters, meaning you should pitch them in opposite directions: as one hand goes up the other goes down, at opposing 45° angles
- Turn right by pressing down the left arm
- Turn left by pressing down the right arm
- Don't twist your spine, but allow the flight surfaces to do all the work

To turn using your legs

- Tilt one leg in the direction of the turn, the tilt should come from the knee down (picture 152)
- It is normal to feel an increase in lift on the inside of the tilting leg's shinbone, so be strong with your hips and core to avoid getting unstable

A more dynamic turn can be achieved by using both methods at the same time, this will create a much faster turn, but harder to control.



picture 152

25.7 Up (slow fall)

When skydiving, this position is used to achieve a slower fall rate. In the tunnel, this position will cause you to move upwards, so start this movement close to the bottom net. To go up while sit flying, simply increase the surface area by opening up your body position, but mainly work with your legs.

- Widen and straighten your legs
- Move your feet out and present the inside surface of your shins to the relative wind - be careful though, remember to keep the bend at the hips to prevent any unwanted forward drive
- Your upper body can also aid with lift by leaning back a little and pushing your chest out
- You can push down onto the wind with your arms slightly, however, be careful when doing this, as they can be pushed too far down, causing you to become unstable or actually lose lift (picture 153)



picture 153

25.8 Down (fast fall)

When skydiving, this position is used to achieve a faster fall rate. In the tunnel, this position will cause you to move downwards, so start a little above head height. To come down while sit flying, simply decrease the surface area you present to the relative wind.

- Bring your legs together
- Relax your arms, bringing them in slightly or lifting them overhead
- To further decrease surface area, you can stand up, which effectively removes the area of your thighs
- Standing up is an advanced form of sit flying, and can cause a loss of control and stability - the key is to keep your feet directly below your hips
- An easier method is to straighten one leg and bring the arms in, leaving the elbows up and out to keep stability
- Bring in the leg that has not been straightened slightly and keep it strong (picture 154)
- Don't forget to stop before reaching the bottom net



picture 154

25.9 Up and down

Going up and down with smooth movement will use the same methods as described above, simply counteracting each movement with the opposite one. You will need to perform the moves with purpose and strength, especially with the legs. Allow extra room between you and the net, to accommodate the stopping distance when going down. Remember, the faster you move, the more distance it will take to stop or the more deliberate your counter-movement will have to be.

25.10 Side slide

Just like performing a side slide in any other orientation, your body will need to remain straight while side sliding in a sit flying position.

- Begin by slowly extending the leg on the side you wish to travel to, driving your heel down
- Straighten out this leading leg at roughly a 45° angle to the body
- Slightly drop the elbow on the same side
- Use your arms for balance
- Keep your chest out to keep level during the movement (picture 155)



picture 155

25.11 Exit

Exiting the tunnel in a sit flying position is relatively easy. Fly towards the door at a nicely controlled speed.

- As you reach the door, make sure that you're flying at waist height
- Aim to exit with your feet first, as to simply finish in a standing position
- As your feet touch down, your arms will need to be folded in to fit through the door
- Be careful not to produce too much forward drive when exiting, this often happens when reaching for the door with your legs (picture 156)

You can of course choose to exit while flying backwards. Remember to always check your level and heading according to the door.



picture 156

Remember:

This section covered the basics of flying in a sit position. As you will be flying on much higher wind speeds than those suitable for belly flying, remember to **ALWAYS** recover on your back and not on your belly when you become unstable.

At first, keep your moves slow and deliberate to feel the effects of your input. Being able to stop momentum in a controlled manner demonstrates true mastering of the techniques, and will prevent you from getting hurt.

Once passing halfway through a move, you will need to change your body position to the opposing position, in order to slow down the momentum and either return to a neutral sit flying position, or begin positioning for the next movement. This will make your flying safer, and your transitions more fluid.

26. Head Down

Flying safely and comfortably in the head down orientation might take some time to master. This section will cover the basic mechanics of head down flying. Again, as you will be flying on high wind speeds, remember to ALWAYS recover on your back or in a sit position and not on your belly when you become unstable.

26.1 Neutral

In the neutral head down position, there are a few different ways to place the legs, usually referred to as flying “daffy”, “straddle” or “shelf”. This manual will only cover the “daffy” position, where you have one leg in front of you, and the other leg behind.

Regardless of your leg position, you should position your upper body so that you

- Maintain a straight spine, neither arch nor round your chest
- Keep your head aligned with your spine, push it back a little and tilt it down towards the net slightly
- Still, fly on the crown of your head, not on your forehead
- Relax your shoulders, do not shrug them towards your ears
- Engage your hips and slightly squeeze your rear
- Keep your elbows slightly away from your torso, and always keep your hands in front of your body
- Your arm position should leave smooth, “clean” air to your legs, not burbling them

Flying the daffy position means that you

- Position one leg in front of you, with a 90° bend at the hip, and a slightly wider angle at the knee
- Keep this leg straight in front of you, to avoid being burbled by your arm
- Position the other leg behind you, with roughly a 90° bend at the knee, so you hook your foot into the wind
- Make sure to keep your hips square with your shoulders (picture 157)
- When you practice, alternate which leg is in front - you will want to become proficient with both



picture 157

26.2 Entrance

When you start practising head down, you will need to walk into the tunnel and go down onto the net. Your instructor will brief you beforehand on the procedure for this. Remember that the wind speeds used for head down are considerably higher than those needed for sit flying. Take your time and allow the spotter to guide you through onto your head.



picture 158

Entering into a head down position as shown in the instructional video requires that you can already fly in a stable head down position and have a good understanding of transitioning from a sit flying position to head down, both over your head and over your back.

To transition over your head

- Stand with your toes slightly over the edge of the door
- Lean forward into the wind a little so as to feel the support from the wind
- Place your head between your legs and allow your feet to rotate over you to the head down position
- Be sure to travel a little forward, to take you away from the door (picture 158)



picture 159

To transition over your back

- Stand with your toes slightly over the edge of the door
- Allow your legs to rotate from under you to the head down position (picture 159)
- This transition through the back is a little easier to master

Realistically, you won't be entering the tunnel like this for a while. Continue practising head down flying and all related transitions before attempting this kind of entries.

26.3 Forwards

To move forwards in the head down position, you need to move out of the neutral position and become slightly “off balance” to create drive. You will need to be strong with your legs and torso to prevent you from bailing.

- Slightly bend the front leg to lose some pressure from the shin
- Slightly straighten the back leg to push against the wind and create drive
- Adjust the position of your chest to keep everything in line (picture 160)
- The easiest way to use your chest is to bring your arms back slightly
- The simple act of moving your arms back a little is enough to allow your chest to open up and produce a small, controlled amount of forward drive



picture 160

26.4 Backwards

Just like moving forwards, you need to move out of the neutral position to move backwards in head down. Again, be strong with your legs and torso.

- Straighten the front leg to gain more pressure on the shin (picture 161)
- Keep your back leg passive
- Adjust the position of your chest to keep everything in line
- The easiest way to use your chest is to push your arms forwards a little so that they appear almost straight out in front of you
- This will allow the chest to produce a controlled amount of backward drive
- Should you become unstable moving backwards, it is tempting to bail onto your belly, but remember that the wind speed is much too high for a belly flight position - if this happens, quickly barrel roll onto your back for a more controlled recovery



picture 161

26.5 Turning 360°

Turning on your head can take some time to master. The best thing to do is to start with small, slow turns and gradually build your way up to larger ones from there. When learning to turn, it is easy to forget about your legs and keeping your body straight, so it is common to lose balance and bail onto your back. In the beginning, it will be easier not to engage your legs too much, and only create drive by changing your arm and head position. Although turning with your legs is much more effective, it might take some practice before you can keep your balance while using this technique.

To turn with your arms and head, it is easiest to move in the direction your front leg is placed, in other words, your front leg leads the turn

- Turn the back of your leading hand to the direction you wish to travel, so you are now able to see the palm of your hand
- Now turn your head so you are looking straight at your palm rather than from the corner of your eye (picture 162)
- This should be enough input to produce a turn
- Stay on the crown of your head throughout the turn

To turn using your legs

- Angle your front foot so that your knee points in the direction you wish to travel, this will expose the inside of your calf to the wind and will help to drive the turn (picture 163)
- You should keep your back leg passive
- Stay on the crown of your head throughout the turn
- Stop the turn with your front leg using the outside of your calf



picture 162



picture 163

26.6 Up (slow fall)

When skydiving, this position is used to achieve a slower fall rate. In the tunnel, this position will cause you to move upwards, so start this movement close to the bottom net. To go up while flying head down, simply increase the surface area by opening up your body position.

- Push your legs wider
- Put your arms straighter and out to the side a little more (picture 164)
- Try to resist the temptation to look at your feet as this will round your shoulders and can cause you to get unstable



picture 164

26.7 Down (fast fall)

When skydiving, this position is used to achieve a faster fall rate. In the tunnel, this position will cause you to move downwards, so start this movement above head height. To come down, simply decrease the surface area you present to the relative wind.

- Keeping your legs in the neutral position will help you to stay balanced and prevents you from descending too quickly
- Relax your arms down to your waist
- The more relaxed your arms are and the closer to your waist, the faster you will go down
- You can increase the speed of your movement further by straightening out

your legs and putting them closer together - be aware that this also reduces your balance (picture 165)

- Remember to stop before hitting the bottom net



picture 165

26.8 Up and down

Going up and down with smooth movement will use the same methods as described above, simply counteracting each move with the opposite one. You will need to perform the moves with purpose and strength. Allow extra room between you and the net, to accommodate the stopping distance when going down. Remember, the faster you move, the more distance it will take to stop.

26.9 Side slide

To be able to side slide on your head is a valuable tool to move around with, and one that many forget. In order to perform a side slide you will need to be quite advanced and strong in your head down position.

- Twist your body 45° to one side
- Lean onto the wind slightly, creating a wing with your body (picture 166)
- This will push you across the tunnel in a sideways motion, with a constant heading
- Remember, to stop you will need to firmly give the opposite input



picture 166

26.10 Exit

To exit in a head down position is obviously not a good idea. You will need to transition into a sit flying position and land on your feet. To begin with, practice this in the middle of the tunnel. As you become a stronger flyer on your head and become more confident in the transitions, you will be able to start flying towards the door in a forward motion and transition into a sit just as you reach the door, either over your belly in a stalling motion, or over your back (picture 167). If you go over your belly, make sure that you leave a sufficient gap to allow your feet to rotate completely underneath you.



picture 167

Remember:

This section covered the basics of flying in a head down position. Again, remember to **ALWAYS** recover from instability on your back or in a sit flying position, and not on your belly.

At first, keep your moves slow and deliberate to feel the effects of your input.

Once passing halfway through a move, you will need to change your body position in order to slow down the momentum and either return to a neutral head down position, or begin positioning for the next movement. This will make your flying safer, and your movements more fluid.

27. Transitions

27.1 Back to sit

To be able to transition from a back flying position to a sit flying position is essential when practising on high wind speeds. Whenever you get unstable, you will be bailing on your back. To get from your back into a sit position again

- Start in a stable back flying position
- Keep your chin back
- Push back your shoulders and stretch out both your arms to present more surface area to the relative wind, this will create lift with your upper body
- At the same time, reduce the surface area of your lower body by dropping your feet down
- Keep your legs strong, and your knees wide for stability
- Keep your hips bent at 90° to avoid forward drive (picture 168)

By flying your upper and lower body in opposite directions - straight up and straight down - the transition will take place automatically. Try not to force it with too much muscle, you will lose control over the transition.



picture 168

27.2 Sit to back

To keep good control while going from a sit flying position to a stable back flying position will help you greatly whenever you get unstable and need to bail on high wind speeds.

- Start in a stable sit flying position
- Slightly round your chest and shoulders to decrease the surface area of your upper body
- Straighten out your knees a little, to create more surface area with your calves
- To control the “fall” onto your back, extend your arms out above your head when in a horizontal position and keep your chin back
- Keep your legs strong and your hips bent at roughly 90° (picture 169)
- Continue in a neutral back flying position

By flying your upper and lower body in opposite directions - straight down and straight up - the transition will take place automatically. Control your “fall” to avoid bouncing on the net.



picture 169

27.3 Back to belly

This transition takes you from a stable back flying position to a stable belly flying position while traveling through the sit flying position. Obviously, the wind speed needs to be lower than for sit flying or head down.

- Start in a stable back flying position
- Create upper body lift by pushing your arms up above your head, and expand your chest to catch wind with your back
- Keep your chin back
- Open your knees at the same time to catch a little lift with the lower part of your body as well
- As you start to move up, bring your knees back in a little and kick your heels down to create the momentum to help you flip onto your belly (picture 170)



picture 170

27.4 Sit to belly

This transition takes you from a low speed sit position to a stable belly flying position.

- Start in a stable sit flying position on low speed, by flying the neutral position a little “bigger” than described before in this manual, increasing the surface area for both upper and lower body.
- Keep your chin up while leaning forward so your chest moves closer to your knees

- At this point, stretch out your arms a little and bring your knees back to create the momentum to flip you on your belly (picture 171)
- Straighten out your legs and continue in a stable belly flying position



picture 171

27.5 Belly to sit

This transition takes you from a stable belly flying position to a low speed sit flying position.

- Start in a stable belly flying position
- Create upper body lift by extending your arms and sucking in your chest (as though being punched in chest) to catch more wind
- As your upper body starts to lift, bend at the hips and bring your knees in under your body (picture 172)
- Continue in a stable, low speed sit flying position



picture 172

27.6 Sit to sit - front flip

This transition is good for practising your stability in the sit flying position.

- Start in a neutral sit flying position in the centre of the tunnel about 1,5 m off the net
- Allow your upper body to rock forwards by tucking your chin into your chest
- Simply bring your head down between your legs and rotate around back into a sit flying position
- Keep your knees about shoulder width apart and refrain from tucking into a ball - ultimately, you want to be able to fly your body through the entire transition, rather than “hucking” it over
- Make sure you are not reaching behind yourself and pressing down with your arms for lift, this will make it hard to perform the transition - keep your arms relaxed and out to the side, and use them as stabilisers (picture 173)

Some people have a tendency to back slide a little during their first attempts. This can happen when you're performing the transition slowly, meaning that you're leaning forward and exposing the front of your torso to the relative wind for enough time that it causes drive. You can counter this by adding a bit more power at the beginning of the move and focusing on a strong finish position. Once you've developed this, you can then work on slowing things down.

It's a good idea to pick a point in your surroundings that will confirm your heading during this transition. After each attempt, check your heading and altitude, and centre yourself to make sure you have enough space between yourself and the walls / net.

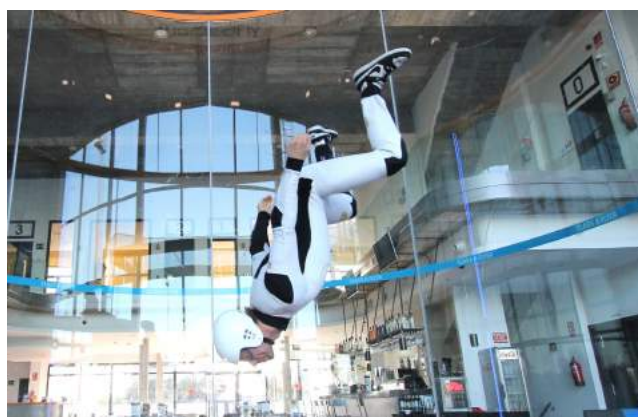


picture 173

27.7 Sit to sit - back flip

Just like the previous transition, this one is good practice to gain stability in the sit flying position.

- Start in a stable sit flying position in the centre of the tunnel about 1,5 m off the net
- Tuck your legs up to your chest
- Round off your chest a little, to initiate the backward rotation
- Allow the momentum of the fall onto your back to carry you over all the way
- Relax your arms, use them as stabilisers during the transition and don't push on the wind
- Halfway through, it's important to keep your legs tightly together and tucked in, otherwise they will probably prevent you from rotating all the way
- While traveling over your head, keep your chin up and look down at the net to continue the rotation back into a stable sit flying position (picture 174)



picture 174

If you're performing the transition slowly and you forget to keep your knees tucked in and close together, it is possible that you get pushed up and backwards halfway through. This means that you're exposing the front of your torso to the relative wind for enough time that it causes drive. Keeping your chin up at this stage will also help you to prevent this. To start with, you can add a bit more power at the beginning of the move and focus on a strong finish position. Once you've developed this, you can then work on slowing things down.



picture 175

It's a good idea to pick a point in your surroundings that will confirm your heading during this transition. After each attempt, check your heading and altitude, and centre yourself to make sure you have enough space between yourself and the walls / net.



picture 176

27.8 Sit to sit - cartwheel

Just like the previous transitions, this one is good practice to gain stability in the sit flying position.

- Start in a stable sit flying position in the centre of the tunnel about 1,5m off the net
- Angle both your legs in the same direction under you, away from your leading side
- Relax your arms to allow the rotation, keep the torso straight and try to keep from leaning either forwards or backwards onto the wind (picture 175)
- Tilt your head in the direction you are rotating, this will help you to keep a reference while rotating all the way through (picture 176)

27.9 Back to head down

This transition is a short and sharp movement, and might take some time to master. In the beginning, it will be easier to transition from a sit flying position onto your head, using the momentum of the rotation over your back, as described in one of the following sections.

- Start on your back in the centre of the tunnel on a head down wind speed - you will have to fly the neutral back flying position “smaller” to stay on an appropriate level
- Keep your arms relaxed but together, to create the pivot point of the transition at your shoulders
- Push your legs a little straighter and pop your hips up, this should rotate you quickly into a head down position, pivoting around your shoulders (picture 177)
- Once in head down, keep your arms out in front of you strongly to stop the rotation, and bring your hips back to neutral to prevent forward drive
- Continue in a neutral head down position



picture 177

27.10 Head down to back

Transitioning from a head down position onto your back is quite easy, but it's a good move to practice regardless, as you will be recovering onto your back whenever you get unstable learning head down. You could say that this transition is practice to “bail in a controlled manner”, learning to adjust your back flying position to higher wind speeds.

- Start in a stable head down position in the centre of the tunnel
- Simply relax your arms, tuck in your chin and round your shoulders to allow the rotation onto your back (picture 178)
- Continue in a back flying position, but fly it smaller than neutral to adjust to the high wind speed



picture 178

27.11 Sit to head - back flip

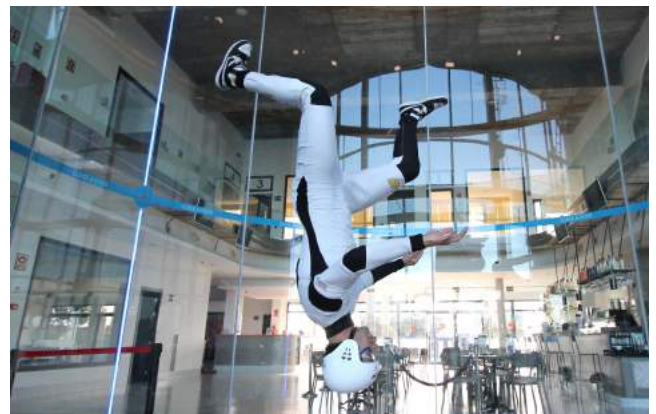
When performing this transition, you'll end up facing 180° away from your original heading. Once you are comfortable with this move, you can change this by turning 90° from your target, performing the transition and then turning back 90° to your target. This may seem like a lengthy process, however, with practice this method will prove to be very fast and effective, and easier to perform than a cartwheel.

- Start in a stable sit flying position in the centre of the tunnel
- Relax your arms and raise them until you feel the airflow on the back of your arms
- Make your chest smaller, cave it in by exhaling - this will make you rotate onto your back as your upper body will no longer produce any lift (picture 179)
- Keep looking through your legs as you fall onto your back - keep your chin tucked in, and allow the airflow to roll over the back of your head
- Avoid throwing your head back to see where you are going - if you anticipate your new heading and try to look behind you, you will arch and counteract the rotation by creating lift with your upper body
- As your upper body continues to sink, make sure your shoulders stay away from your ears, don't shrug
- Allow your legs to fly upwards by slightly straightening your knees - you'll feel the lift on the back of your calves
- As your legs gain lift and your upper body loses lift, you can rotate through into a head down position (picture 180)
- Make sure to keep your legs symmetrical and your knees about shoulder width apart
- The leg that is to become your forward one in the daffy should continue to stay bent 90° at the hip
- As you end the move, uncurl your head from the tucked position, and begin to focus on flying on the crown of your head

- It is important to rotate all the way to vertical before opening up into the neutral head down position - if you open up too early, it will stop the rotation and push you onto your back
- Think about having a little pause between reaching vertical and then opening out to the head down position, adjust your legs first then the arms



picture 179



picture 180

27.12 Head to sit through the back

Transitioning from a head down position into a sit flying position is quite easy, but it's a good move to practice, as it is a safe way to recover whenever you get unstable learning head down. Just like the "head down to back flying" transition, you could say that this is practice to bail in a controlled manner. But instead of staying on your back, you will now transition further into a sit flying position, which is more comfortable than the back flying position on high wind speeds.

- Start in a stable head down position in the centre of the tunnel
- Relax your arms and legs and slightly collapse at the hips
- Bring your chin to your chest to round off your shoulders - this will make you rotate onto your back as your upper body will no longer produce any lift (picture 181)
- Once on your back, continue the move into a sit flying position by expanding your chest and dropping your heels - normally, this last part will be effortless, as you can simply let the momentum of the rotation carry through



picture 181

27.13 Sit to head - front flip

This transition from a sit flying position into a head down position is a little harder to master than when performing a back flip. When going over the belly halfway through, it is key to adjust your body position to the high wind speed, to prevent you from being thrown off balance and up.

- Start in a stable sit flying position in the centre of the tunnel
- Relax your arms, this might cause you to drift downwards a little
- Move your head down between your legs but keep your chin back and up initially
- Your arms should now be straight and behind your shoulders (picture 182)
- Allow your legs and body to rotate over your shoulders
- Once vertical, open out into a head down position
- You will need to stop the movement with your arms firmly out in front of you, to prevent forward drive and over rotation



picture 182

27.14 Head to sit through the belly

This transition from a head down position into a sit flying position is a little harder to master than when going through the back. When going over the belly halfway through, it is key to adjust your body position to the high wind speed, to prevent you from being thrown off balance and up.

- Start in a stable head down position in the centre of the tunnel
- Tilt your head up, so that you are now looking directly below you
- Relax your arms, and relax your legs
- Descend and rotate through onto your belly, while you keep looking up (picture 183)
- As you go onto your belly bring your legs closer to your chest and keep your arms slightly behind your shoulders
- Rotate through to a sit fly position quickly, to avoid gaining too much upward drive going over your belly



picture 183

27.15 Head to sit - cartwheel

This transition takes you from a head down position into a sit flying position through a sideways motion.

- Start in a stable head down position in the centre of the tunnel
- Bring your legs more in line with each other, giving up the “daffy” position
- At the same time, bring your leading arm in to your body, this is the arm on the side to which you chose to perform the transition - this will start sideways rotation
- Angle both your legs slightly to your leading side
- It helps to tilt your head in the direction you want to move
- Keep your torso straight and try to keep from leaning either forwards or backwards onto the wind (picture 184)



picture 184

27.16 Sit to head - cartwheel

This transition takes you from a sit flying position into a head down position through a sideways motion. You start this move in the same way as a sit to sit cartwheel, however, as you reach the vertical point, you need to stop and open up into the head down position.

- Start in a stable sit flying position in the centre of the tunnel about 1,5m off the net
- Angle both your legs in the same direction under you, away from your leading side
- Relax your arms to allow the rotation, bring your leading arm closer to your body
- Keep your torso straight and try to keep from leaning either forwards or backwards onto the wind (picture 185)
- Tilt your head in the direction you are rotating, this will help you to keep a reference
- Once vertical, open up into a stable head down position



picture 185

27.17 Head to head through the back

This transition takes you from a head down position back into a head down position, traveling over your back. It is a combination of previous transitions, i.e. from head down to sit over your back, and from there back to head down over your belly.

- Start in a stable head down position in the centre of the tunnel
- Rotate onto your back and through into a sit flying position (for a more detailed description read section 27.12)
- Keep rotating forward, over your belly, into a head down position (for a more detailed description read section 27.13)

Remember, to stop the rotation when you're back on your head, be strong with your legs and arms.

27.18 Head to head through the belly

This transition takes you from a head down position back into a head down position, traveling over your belly. It is a combination of previous transitions, i.e. from head down to sit over your belly, and from there back to head down over your back.

- Start in a stable head down position in the centre of the tunnel
- Rotate over your belly into a sit flying position (for a more detailed description read section 27.14)
- Keep rotating, over your back, into a head down position again (for a more detailed description read section 27.11)

Remember, to stop the rotation when you're back on your head, be strong with your legs and arms.

27.19 Head to head - cartwheel

This transition takes you from a head down position back into a head down position, in a sideways motion with a constant heading. It is a combination of previous transitions, i.e. from head down to sit through a cartwheel, and from there back to head down continuing the cartwheel in the same direction.

- Start in a stable head down position in the centre of the tunnel
- Start a cartwheel by bringing in your leading arm and tilting your head to the same side (for a more detailed description read section 27.15)
- Halfway through, you will find yourself in a sit flying position
- From there, continue the cartwheel rotation back into a head down position (for a more detailed description read section 27.16)

The smaller you make your legs during the rotation, the easier it will be to perform the transition on the spot. Again, remember to keep your torso straight and try to keep from leaning either forwards or backwards onto the wind.

Remember:

This section covered different transitions between the sit flying and the head down position. Again, remember to ALWAYS recover on your back or in a sit flying position and not on your belly when you become unstable.

Normally, your instructor will be there to guide you through the transitions safely, and will in the beginning take a firm, controlling grip to prevent you from flying into the tunnel walls.

The more deliberate your input, the faster the moves will be. Learn how to precisely control your planned moves, rather than going too fast too soon, and possibly get hurt in the process.

If you feel insecure, or you are about to lose control, simply relax and return to a neutral flying position, either on your back or sit flying.



Class B Flyer - Dynamic

To watch the video visit the website at www.tunnelinstructor.org
or the facebook page at www.facebook.com/Tunnelinstructor

28. Dynamic high speed flying

Just as with Class A dynamic flying, you can fluently combine all your Class B Flyer moves, but this time on higher wind speed.

The suggested moves to practice are listed on the right and shown in detail in the online videos. They are exactly the same as the ones suggested for the Class A dynamic flying. Again, the possibilities for combining your moves are basically endless.

28.1 Suggested dynamic moves

Head up

- Back to belly - long transition
- Belly to back - long transition
- Head up inface carving
- Head up inface carving changing direction
- Head up outface carving
- Head up outface carving changing direction
- Head up inface carving into head up outface carving
- Head up outface carving into head up inface carving

Head down

- Head down inface carving
- Head down inface carving changing direction
- Head down outface carving
- Head down outface carving changing direction

Head up and head down

- Head up inface carving into head down inface carving
- Head up outface carving into head down outface carving
- Back layout
- Back layout into head down outface carving
- Front layout into head down inface carving
- Head down inface carving into layout
- Stalls
- Stalls into layout
- Head down inface carving into head down outface carving
- Head down outface carving into head down inface carving

Transitions

- Belly to belly - front flip
- Belly to belly - back flip
- Back to back - front flip
- Back to back - back flip



Class B Spotter

To watch the video visit the website at www.tunnelinstructor.org
or the facebook page at www.facebook.com/Tunnelinstructor

29. Introduction

This manual covers all the freefly spots you have to be able to perform to become a Class B Instructor. In order to progress to this level of spotting, you must have shown a good level of spotting according to the Class A standard over a consolidation period. As a freefly spotter, you will be expected to work in high wind speeds on a regular basis. As this increases the risk of becoming off balance or even lifted off the net when spotting, you need to show that you can at least fly solidly on your back on high wind speeds, transition into a sit flying position and return to the net without any problems. In freefly spotting, there is a break down of the disciplines and the respective difficulty level of the moves being attempted. The break down is shown below.

Discipline: belly, back, sit, head down
 Difficulty: basic, intermediate, advanced, expert

The first part of the manual covers the skills needed for spotting a Class A Flyer, i.e. spotting belly flying and back flying positions on low wind speed. The second part covers the skills needed for spotting a Class B Flyer, i.e. spotting sit flying and head down positions on high wind speed.

As a general rule when spotting for freefly, you always need to be aware of which direction the flyer could get unwanted drive, and position yourself accordingly.

30. Spotting a Class A Flyer

30.1 Barrel roll - belly to back

When spotting barrel rolls, you can use the same hand placements regardless of the starting position of the flyer. Position yourself in front of the flyer, and encourage him to keep eye contact while transitioning. This will help the flyer to maintain level and heading throughout the move.

- Stand on the net directly in front of the flyer
- Cross your arms and with one hand, take hold of the flyer's hand right opposite
- With your other hand, take a firm grip on the flyer's opposite shoulder (picture 186)
- The flyer's arms should remain straight and uncrossed
- The way you cross your arms will dictate the direction of the flyer's rotation, as the barrel roll should uncross your arms



picture 186

As the flyer becomes more competent in the execution of the barrel roll, you can begin to lessen the amount of control you have during the transition. In stead of taking a grip on the flyer's shoulder, you can choose to hold both hands, again starting with your own arms crossed. This progresses into holding only one hand, and eventually into merely shadowing the move.

You will need to remain in front of the flyer to prevent him from getting hurt in case he produces forward drive and / or lift during the transition. Only when the flyer has shown complete control, you can move away.

30.2 Barrel roll - back to belly

The hand placement for spotting this transition is basically the same as for the previous one, the only difference being the starting position of the flyer. Again, stand directly in front of the flyer and encourage him to keep eye contact throughout the barrel roll.

- Stand on the net directly in front of the flyer
- Cross your arms and with one hand, take hold of the flyer's hand right opposite
- With your other hand, take a firm grip on the flyer's opposite shoulder (picture 187)
- The flyer's arms should remain straight and uncrossed
- The way you cross your arms will dictate the direction of the flyer's rotation, as the barrel roll should uncross your arms

Again, as the flyer becomes more competent in the execution of the barrel roll, you can begin to lessen the amount of control you have during the transition. In stead of taking a grip on the flyer's shoulder, you can choose to hold both hands, starting with your own arms crossed. This progresses into

holding only one hand, and eventually into merely shadowing the move.



picture 187

Remember to stay in front of the flyer until he has proved full control over the transition.

30.3 Barrel roll - belly to belly

Again, use the same hand placement as previously described, starting with your own arms crossed, and stood directly in front of the flyer.

The only difference to spotting the previous transitions is that after the barrel roll, your arms will end up crossed again, as the flyer makes a full 360° rotation over the horizontal axis.

You can again gradually lessen the amount of control you have during the transition, but always stay in front of the flyer until he has proven to be confident.

All the above also applies for spotting a back to back barrel roll.

30.4 Belly to stand

The flyer is most likely to gain unwanted backward and upward drive in the beginning. To spot this transition from belly to stand safely, it is best to position yourself next to the flyer.

- Stand closely next to the flyer
- Take a grip on the flyer's shoulder closest to you with your hand that is at the flyer's foot end
- Take a grip on the flyer's waist with the other hand (picture 188)
- It might feel awkward to start the transition with your arms being crossed, however, as the flyer transitions your arms will uncross (picture 189)



picture 188

You can again lessen the control you have over the transition as the flyer progresses. The first grip to drop would be the one at the waist. Don't move away from the flyer until he has shown full control.

30.5 Stand to belly

This spot is a reverse of the previous one. Again, be prepared for possible unwanted drive backwards and up in the beginning.

- Stand closely next to the flyer
- Grip the flyer's shoulder with your hand closest to him - closest as if you would be facing the same direction as the flyer
- Take a grip on the flyer's waist with your other hand (picture 189)
- As the flyer transitions, you will end up in the starting position for the belly to stand transition (picture 188)



picture 189

You can again lessen the control you have over the transition as the flyer progresses. The first grip to drop would be the one at the waist. Don't move away from the flyer until he has shown full control.

30.6 Stand to back

The flyer is most likely to gain unwanted forward and upward drive in the beginning. Also be prepared for the flyer rounding off his body position too much, causing him to fall on the net. To spot this transition safely, it is best to position yourself next to the flyer.

- Stand closely next to the flyer
- Grip the flyer's shoulder with your hand closest to him - closest as if you would be facing the same direction as the flyer
- With your other hand, take a grip at his waist (picture 190)
- You will use the waist grip to push back firmly in case the flyer extends too much at the hips, creating forward and/or upward drive



picture 190

As the flyer progresses, you can start releasing the waist grip, then later on the shoulder grip. Don't move away from the flyer until he has proven full control of the transition.

30.7 Back to stand

This spot is a reverse of the previous one. Again, be prepared for possible unwanted drive forwards and up in the beginning.

- Stand closely next to the flyer
- Grip the flyer's shoulder with your hand that is closest to his head
- With your other hand, take a grip at his waist (picture 191)
- You will use the waist grip to push back firmly, forcing the flyer to return to the back flying position in case he extends too much at the hips creating forward and/or upward drive



picture 191

As the flyer progresses, you can start releasing the waist grip, then later on the shoulder grip. Don't move away from the flyer until he has proven full control of the transition.

30.8 Walking

The grips you use when teaching a flyer to walk should allow you to physically control his position in the wind, and move his body into the correct position with relative ease.

- Take a grip on the waist and shoulder of the flyer, whilst standing next to him facing the same way
- You can choose to change your hand placement and make it opposite for walking backwards and forwards, so that your arms will not end up being crossed should the flyer bail

When walking forwards, it is more likely for the flyer to bail onto his back when getting unstable, so

- With your hand closest to the flyer, take hold of the shoulder
- With the hand that is furthest away, take a grip at his waist (picture 192)



picture 192

When walking backwards, it is more likely for the flyer to bail onto his belly when getting unstable, so

- With your hand closest to the flyer, take a grip at the waist
- With the hand that is furthest away, take a grip at his shoulder



picture 193

- You can easily keep the same hand placement as shown for walking forwards and link the movements more fluently. Simply drop the grip at the waist and firmly control the shoulder grip should the flyer bail on his belly (picture 193)

As the flyer progresses, you can start releasing the shoulder grip, then later the waist grip. Don't move away from the flyer until he has proven full control.

30.9 Belly to back

You will set up in the same way as for spotting the flyer going from his belly to a standing position. Remember that as the flyer transitions your arms will uncross.

- Stand closely next to the flyer
- Be aware that the flyer should be gaining a little height at the beginning of the transition, so set up with the flyer a little lower than your waist level to allow for this
- Take a grip on the flyer's shoulder closest to you with your hand that is at the flyer's foot end
- Take a grip on the flyer's waist with the other hand (picture 194)
- Be aware that the flyer might round off his upper body position too much when transitioning to his back - if so, be strong with the shoulder grip to prevent him from falling on the net

As the flyer progresses, you can perform the spot without the grip on his waist, instead you can help the legs through if needed. Don't move away from the flyer until he has proven full control.



picture 194

30.10 Back to belly

You will set up in the same way as for spotting the flyer going from his back to a standing position. But after the transition, your arms end up crossed.

- Stand closely next to the flyer
- Again, be aware that the flyer should be gaining a little height at the beginning of the transition, so set up with the flyer a little lower than your waist level to allow for this
- Grip the flyer's shoulder with your hand that is closest to his head
- With your other hand, take a grip at his waist
- Be aware that the flyer might lose lift and over rotate - if so, be strong with the shoulder grip to prevent him from falling on the net

As the flyer progresses, you can release the waist grip and help the legs through the transition if needed.

(picture 195)

Don't move away from the flyer until he has proven full control.



picture 195

30.11 Front layout

To spot a flyer through a front layout, meaning a transition from his belly onto his back rotating over his head, you will again set up closely next to the flyer.

- Stand closely next to the flyer
- Grip the flyer's shoulder with your hand that is closest to his head
- With your other hand, take a grip at his waist (picture 196)
- The flyer should be gaining a little height at the beginning of the transition, so set up with the flyer a little lower than your waist level to allow for this
- Be aware that it is possible that the flyer creates unwanted forward drive in the beginning sending him into a track, so be strong with both grips
- With the grip on the flyer's waist you will aim to help guide his hips over his head and make him transition onto his back
- You end up with crossed grips (picture 197)



picture 197



picture 196

As the flyer progresses, you can perform the spot without the grip on the flyer's waist. Shadow his hips with the free hand and hook them over his head should it be needed. Be ready with the shoulder grip for a continuing forward movement as the flyer lands on his back. Keep strong with this grip and think about pulling it into you.

30.12 Back layout

To spot a flyer through a back layout, meaning a transition from his back onto his belly rotating over his head, you will again set up closely next to the flyer.

- Stand closely next to the flyer
- Grip the flyer's shoulder with your hand closest to his head
- With your other hand, take a grip at his waist (picture 198)
- The flyer should be gaining a little height at the beginning of the transition, so set up with the flyer a little lower than your waist level to allow for this
- Be aware that it is possible that the flyer creates a lot of unwanted backward drive in the beginning sending him into a track, so be strong with both grips
- As with the front layout, your aim is help guide the flyer's hips over his head
- You end up with your arms crossed (picture 199)



picture 199



picture 198

As the flyer progresses, you can perform the spot without the grip on the flyer's waist. Shadow his hips with the free hand and hook them over his head should it be needed. As the flyer lands on his belly, you should be prepared for a little back slide, so be strong with the shoulder grip.

30.13 Inface carving

The inface carving movement is basically a forward movement on the back combined with a turn. To spot a flyer while inface carving, you will stand in the middle of the tunnel with the flyer's head towards you. The flyer should be at your waist height.

- Take a hand grip on the flyer's trailing arm
- Your arms should not be crossed
- While the flyer is carving you will have to turn with him (picture 200)
- To stop the flyer, place your free hand on the back of the flyer's head and gently roll his head up, i.e. move his chin towards his chest - this will collapse the flyer into a back flying position
- Let the flyer's movement continue until you can block his path and take a controlling grip over his waist
- When you have the control grip over the waist and the flyer is next to you, you can release the hand grip



picture 200

30.14 Outface carving

The outface carving movement is basically a backslide on the belly, combined with a turn. To spot a flyer while outface carving, you will stand in the middle of the tunnel with the flyer's back towards you. The flyer should be at your waist height, with his head towards the middle of the tunnel.

- Take a grip on both of the flyer's shoulders
- Your arms should not be crossed
- While the flyer is carving, you will have to turn with him (picture 201)
- To stop the flyer, release the leading shoulder grip and present your side so that the flyer now rotates into you
- As the flyer rotates into you, take a controlling hip to hip grip on the flyers waist
- When you have the control grip, you can release the other shoulder grip



picture 201

31. Spotting a Class B Flyer

All flyers wishing to become a Class B Flyer need to have shown a competent level of back flying, as this is the recovery position on high wind speeds. As a spotter, you can ask to see the flyer perform some basic tasks on his back to allow you to assess his skills. Always better to be safe than sorry.

31.1 Back to sit

To perform this spot you will set up in the same way as a back to stand transition.

- Stand closely next to the flyer
- Make sure the flyer is around your waist height
- Grip the flyer's shoulder with your hand that is closest to his head
- With your other hand, take a grip at his waist (picture 202)



picture 202

- You will use the waist grip to push back firmly, forcing the flyer to return to the back flying position in case he extends too much at the hips creating forward and/or upward drive

As the flyer progresses, you can release the grip at the waist, but still remain vigilant for the possible forward drive caused by his

hips, stay ready to take a controlling grip. (picture 203)

31.2 Sit to back

This spot is a reverse of the back to sit transition, using the same grips.

Be aware of the potential continued drive towards his feet as the flyer goes onto his back. Also, due to the higher wind speed, it's possible that the flyer gains some height as he gets onto his back - be strong and pull in on the grips if needed.

As the flyer progresses, you can release the grip at the waist, but still remain vigilant for the possible forward drive caused by his hips, stay ready to take a controlling grip. (picture 203)



picture 203

31.3 Controlling sit flyer

To control a sit flyer, use a combination of hooks and blocks.

- Place yourself in front of the flyer
- To stop the flyer from turning unwantedly, use hooks and blocks on the flyer's knees to keep him facing towards you as much as possible (picture 204)
- If the flyer gains unwanted forward drive, take a grip on the outside of both his knees and bring his legs together, this will make him descend onto the net, stopping the forward drive
- If the flyer gains forward drive fast, step aside and take a controlling grip across his waist, like this you can collapse the flyer onto his back and stop the forward movement (picture 203)
- If the flyer goes too high, use the same technique of taking controlling grips on the outside of his knees, bringing his legs together but this time actively pulling down also



picture 204

31.4 Sit to sit - front flip

To spot a sit to sit front flip, position yourself closely next to the flyer, facing the same way.

- For the first attempts, let the flyer start on the net in the sit position
- With the hand furthest away from the flyer, take a grip on his shoulder - you will need to place your hand over the shoulder to take this grip, allowing for the rotation
- With your other hand, take a grip at the flyer's waist
- When ready, you can shake the grips to let the flyer know you're good to go
- As the flyer begins to rotate, you can help guide his hips over his head, back into the sit flying position
- Hold the waist grip for as long as possible as this increases your control - however there is of course a point where you'll have to let go

As the flyer progresses, remain on the shoulder grip but release the waist grip. You can help the flyer's legs over his head if needed. (picture 205)



picture 205

31.5 Sit to sit - back flip

To spot a sit to sit back flip, position yourself closely next to the flyer, facing the same way.

- With the hand furthest away from the flyer, take a grip on his waist
- With your other hand, take a shoulder grip
- When ready, you can shake the grips to let the flyer know you're good to go
- As the flyer begins to rotate, you can help guide his hips over his head, back into the sit flying position
- Again, hold the waist grip for as long as possible to keep control

As the flyer progresses, remain on the shoulder grip but release the waist grip. You can help the flyer's legs over his head if needed. (picture 206)



picture 206

31.6 Sit to sit - cartwheel

To set up correctly for spotting the sit to sit cartwheel, you have to first decide in which direction the flyer will rotate.

- Place yourself directly behind the flyer, who is on the net in a sit position
- Put your left hand on the flyer's right shoulder and your right hand on the flyer's left shoulder
- If the flyer will rotate to the right, your right arm should be above your left arm, to allow for the rotation of the cartwheel (picture 207)
- Your arms will uncross at the middle stage of the transition, when the flyer is in a head down position
- Your arms will then cross again as the flyer continues to rotate back into the sit position

If the flyer will rotate to the left, change your hand placement to the opposite as described above.



picture 207

31.7 Head down on the net with grips

There are two methods for spotting a flyer who is learning head down starting from the net. Your positioning should always be such that you are not burbling the flyer's back leg. The way you choose to set up for the spotting will depend on whether you know beforehand which leg will be the back leg.

If you know which leg the flyer will put back

- Stand face to face in front of the flyer
- Knowing which leg will be going back, you know which side you need to be in - place yourself on the opposite side of that leg
- With your hand now closest to the flyer, take a firm grip on that side's shoulder e.g. if the flyer's left leg will go back, stand towards his right side and put your right hand on his right shoulder
- When you have taken this shoulder grip, place your left hand firmly on his back to help control the rotation (picture 208)
- Signal that you are ready for the flyer to proceed e.g. by shaking the grips
- Let the flyer go down to the kneeling position, continued by placing his head on the net
- Once the flyer is head down on the net, change your left hand's position and take a firm grip at the flyer's waist on the side



picture 208

- Stay to the flyer's right side to avoid burbling the back leg
- If the flyer is able to lift from the net and maintain a stable flying position, you can carefully release the shoulder grip to allow for "cleaner air" around the flyer's upper body

If you don't know which leg will be the flyer's back leg

- Stand face to face in front of the flyer
- Take a firm grip with each hand on the flyer's shoulder directly opposite
- Signal that you are ready for the flyer to proceed e.g. by shaking the grips
- Let the flyer place his head on the net, guide his movement closely with firm grips
- As the flyer continues to a head down position on the net, leave your elbow above your hand on one side, so as to create a barrier and avoid over rotation of the flyer (picture 209)
- Once the flyer is in a head down position and has put one leg back, you can see which side you need to position yourself on
- Keep both hands on the shoulder grips while you move away from the back leg, but then change the one shoulder grip furthest away from you, and in stead grip at the waist on the side you have moved to
- Again, if the flyer is able to lift from the net and maintain a stable flying position, you can carefully release the shoulder grip to allow for "cleaner air" around the flyer's upper body



picture 209

31.8 Head down on the net stabilising the flyer

If the flyer starts to get unstable and causes unwanted movement while on the net in a head down position, you can control this by pulling your grips or using blocks on the flyer's waist or shoulder.

31.9 Changing place to avoid burbling the leg

Should the flyer decide to change the leg he has at the back, you have to change your position as well, to avoid burbling the back leg.

In case you are spotting by using the two shoulder grips, quickly move around the back from one side to the other, while keeping firm control of both grips.

In case you are spotting by using one shoulder grip and one waist grip, the safest way to deal with a back leg switch is to bail the flyer and start over, now positioning yourself on the other side.

31.10 Head down on the net bailing the flyer

The way in which you bail a flyer depends on which method you are using to spot.

In case you are spotting by using the two shoulder grips

- Release the shoulder grip that is furthest away from you and move that hand to take a grip or hook on the flyer's waist

- Press down on the hip, and with the other hand, push the shoulder out from under the flyer (picture 210)
- This will rotate him onto his back

In case you are spotting by using one shoulder grip and one waist grip

- Release the waist grip and place that arm all the way across the flyer's hips
- Push down on the hips to collapse them and bail the flyer on his back
- With your other hand, you will need to slightly push the shoulder from underneath the flyer to facilitate the move (picture 211)



picture 210



picture 211

31.11 Head down on the net assisting the flyer

If the flyer needs small adjustments of his body position while in head down on the net, you can either release the shoulder grip furthest away from you when spotting with 2 shoulder grips (picture 212) or release the grip at the waist when spotting with a shoulder grip and a waist grip. Use your free hand to correct the flyer's position e.g. adjusting the position of his legs.

Use your clean air awareness to avoid burbling the flyer.



picture 212

31.12 Recovering unassisted flyer

As the flyer becomes better at controlling the head down position, you can carefully release your grips, starting with the shoulder grip. Should you get to the stage where you no longer have any grips on the flyer, you should remain closely next to him, ready to catch him in case he becomes unstable. You should aim to retake your controlling grips before the flyer bails.

In case the flyer bails before you have the chance to reposition your grips, be strong and fast to catch him, preventing any unfortunate incidents. Although the flyer should know not to bail on his belly in head

down wind speeds, getting off balance in the early learning stages doesn't always happen in a textbook way. Therefore, if the flyer bails onto his belly

- Place your arm furthest away from the flyer across his back (picture 213)
- As the flyer will be overpowered by the wind speed, you have to roll him over onto his back as soon as possible (picture 214)
- Do this by using the "static roll around" method (as described in detail in the Class A Spotter Manual).



picture 213



picture 214

If the flyer is creating unwanted drive on the net, threatening to go into a tracking position

- Be quick to place your arm closest to the flyer across his back (picture 215)
- Place your other arm across his waist
- Now effectively "sandwiching" him between your 2 arms, rotate the flyer onto his back (picture 216)



picture 215



picture 217



picture 216



picture 218

If the flyer is able to fly off the net unassisted and you need to bail him for any reason

- Place yourself behind the flyer
- With your left arm, hook under the flyer's right shoulder - his shoulder should be in your elbow joint
- With your right arm, hook over the flyer's right armpit (picture 217)
- Doing this, you are burbling the flyer, making him sink out of the head down position
- While sinking the flyer, pull in with your left arm and push out with your right arm - this will rotate the flyer onto his back (picture 218)
- You will have to twist slightly as you do this, to assist the movement

31.13 Head through net recovery

One of the most serious risks when teaching head down on the net, is the flyer's head going through the net. As a spotter, you must ensure that the net is prepared correctly before the flyer places his head onto it.

Should the situation of the net parting arise regardless, and the flyer's head goes through it, remain calm and perform the following sequence.

- Take a grip across the flyer's waist and hold him tight
- Stay strong with the remaining grip on the shoulder as well (picture 219)
- Signal to the driver that the wind speed needs to come down to idle
- As the wind speed is dropped, slowly and carefully lower the flyer to a kneeling position
- Once the flyer is kneeling down and the wind speed is reduced to idle, you can let go of the flyer and focus on parting the net and extracting the flyer's head



picture 219

During this situation the flyer might be stressed, and might try to lift his head out before the wind speed is lowered sufficiently to do so. It is your job to remain in control of

the situation and to try prevent any injuries from happening to the flyer.

If the flyer is wearing an open face helmet, it is very likely that his goggles have moved or even came off, and the wires of the net can cause cuts and scrapes in the face. Consider this risk while gearing up the flyer.

Always make sure to report any incidents correctly, according to the tunnel's risk management policy.

31.14 Sit to head down - back flip

To spot head down transitions correctly, you need to know which leg will be the flyer's back leg. For spotting a sit to head down transition over the back

- Stand closely next to the flyer on the side of the leg that will be in front in the head down position
- The flyer is in a sit fly position, on or close to the net
- With your hand closest to the flyer, take a grip on his shoulder
- With the other hand, take a waist grip
- For example, if you are standing on the right side of the flyer, your left hand takes the shoulder grip and your right hand takes the waist grip (picture 220)
- As the flyer rotates onto his head, he will probably gain a little height, allow for this as it facilitates the rotation
- To aid the flyer, you can gently push on both grips in opposite directions, as to help align the flyer's hips and shoulders
- Once the flyer is in the head down position, allow him to stabilise before releasing any grips



picture 220

As the flyer progresses, you can spot this transition releasing the waist grip, and simply shadowing with this hand in stead. If

needed, gently push on the back of the flyer to assist the rotation.

31.15 Head down to sit through the back

This transition is a reverse of the previous one, and the grips for spotting are exactly the same.

- Take the grips while the flyer is in a stable head down position - or keep them in place should this transition simply be the continuation of the previous one (picture 221)
- Taking grips might cause the flyer to sink a little - if the flyer drops too low, force the transition yourself

As the flyer progresses, you can release the waist grip. But this time, shadow the hips from the front rather than from the back, so you can stop unwanted forward drive while the flyer rotates to the sit flying position.



picture 221

31.16 Sit to head down - front flip

To set up for this transition, position the flyer face to face in front of you in a sit fly position on the net.

- Take a grip on the flyer's shoulder as if he was going to do head down on the net
- As the flyer begins to rotate towards you, put your hand on the flyer's back around waist height (picture 222)
- The flyer will possibly gain a lot of lift or power through the rotation stage of the transition, so you need to be strong with the waist grip especially
- Once the flyer is on his head, allow him to settle before releasing any grips
- Keep in mind you will be releasing the hand on the flyer's back and only keep the shoulder grip to begin with - make sure you have this grip on the side of the flyer's front leg, to avoid burbling the back leg

As the flyer progresses, you can release the waist grip during the transition and shadow in stead. Be ready to push back to prevent over rotation.



picture 222

31.17 Head down to sit through the belly

This transition is a reverse of the previous one, and the grips for spotting are exactly the same.

- Take the grips while the flyer is in a stable head down position - or keep them in place should this transition simply be the continuation of the previous one
- Again, be aware that this might cause the flyer to sink a little - if the flyer drops too low, bail the flyer onto his back
- If transitioning too slow, the flyer might catch air on his belly halfway through and gain a lot of lift - make sure the continuation into a sit flying position is without hesitation (picture 223)

As the flyer progresses, you can release the waist grip during the transition and shadow in stead. Be ready to hook the flyer's legs through the transition if needed. Don't push them too hard, as this might cause over rotation, making the flyer finish on his back in stead.



picture 223

31.18 Sit to head down - cartwheel

The set up for this spot is the same as for the “sit to sit - cartwheel” transition. For correct hand placement, you have to know in advance in which direction the flyer will rotate.

- Place yourself directly behind the flyer, who is close to the net in a sit position
- Put your left hand on the flyer’s right shoulder and your right hand on his left shoulder
- If the flyer will rotate to the right, your right arm should be above your left arm, to allow for the rotation of the cartwheel (picture 224)
- Your arms will uncross when the flyer is in a head down position
- If the flyer will rotate to the right, change your hand placement to the opposite as described above
- Once the flyer has rotated into the head down position, assess which leg is the back leg and step away to the correct side
- When at the side, you can release the shoulder grip furthest away from you to give the flyer “clean air” and become stable



picture 224



Questionnaire

32. Questionnaire

This questionnaire is meant as a quick test of your understanding of the manuals and the Tunnel Instructor Organisation. To get your instructor rating, you should be able to answer the following questions correctly. Enjoy!

1. **A first-time flyer is flying unpredictable, got above your head height and won't react to your hand signals to make him come down.**
 - A. You follow the flyer on the net, waiting for him to come down by getting unstable and then make your spot.
 - B. You communicate with the controller to put the speed down and you burble the flyer to get him down to a comfortable level.
 - C. You fly up to his level to communicate face to face.

2. **A Flyer in your class loses his helmet while flying. As the instructor, you will**
 - A. Signal the emergency stop to the controller.
 - B. Continue the flight and recover the helmet in the end of the session.
 - C. Get the customer out as soon as possible and retrieve the helmet before continuing with other customers.

3. **A Flyer is attempting head down on the net without a coach on your session. You are a Class B Spotter.**
 - A. You spot the flyer, as you know how to do this.
 - B. You tell the flyer to practise something else, as this is not safe without a coach.
 - C. You let the flyer attempt head down and spot from the door, it's the flyer's own responsibility.

4. **While entering a first-time customer, you see the customer is still wearing a necklace.**
 - A. You proceed and hope the necklace won't come off. It's only a 1 minute rotation.
 - B. You tell the customer to take it off and leave it outside of the flight chamber (as it might both be painful for the customer during flight, and dangerous should it come off). You proceed with the next flyer for now and take this customer when (s)he is ready.
 - C. You tell the customer (s)he loses the flight, as (s)he should have listened better during gearing up and briefing.

5. **A Flyer is attempting head down on the net without a coach on your session. You are a Class A Spotter.**
 - A. You let the flyer attempt head down and spot from the door, it's the flyer's own responsibility.
 - B. You tell everybody to wait a moment while you quickly leave the tunnel to find a Class B Spotter.
 - C. You communicate with the driver who can call for a Class B Spotter on the job. You make sure the flyer practises something else until a properly rated fellow instructor can take your place.

6. You are a Class A Spotter on a session with multiple skydivers. The 2 skydivers are belly flyers and are both to become unstable at the same time. One is about to go head down above the door, the other one is about to turn on his back around waist height. What do you do?
- A. There is nothing you can do in this situation.
 - B. You go for the back spot because it's closer to you.
 - C. You go for the head down spot.
7. As a rated Class B Flyer
- A. You can sign off Class A Flyers and new Class B Flyers.
 - B. You can sign off Class A Flyers only.
 - C. You can not sign off other flyers.
8. You are on duty as a controller for a freefly session. The coach is a world champion skydiver and has a lot of experience with students in the tunnel. The coach asks you to put the wind speed up, but the instructor asks you to put it down. What do you do?
- A. You listen to the very experienced coach.
 - B. You listen to the instructor, who always makes the final decision in situations like these.
 - C. You do nothing and leave the wind speed unchanged.
9. You are spotting for a session with skydivers, and the coach is about to take in a student who has never tried the tunnel before. The coach is not a rated instructor.
- A. You let the coach take the student, it's his responsibility.
 - B. You take the student during the whole session because you believe you can do a better job than the coach.
 - C. You take the student yourself, but leave him to the coach as soon as he's reasonably stable.
10. You are on duty as a controller. You get a phone call and you can see it's the General Manager. At this point, the instructor is signalling you to adjust the wind speed.
- A. You ignore the phone call.
 - B. You ignore the instructor and take the call.
 - C. You take the call, but explain the situation and ask to hang on while you adjust the speed.

Thank you!

The Tunnel Instructor Organisation wants to thank you for your interest. We hope you enjoyed reading our manuals as much as we enjoyed making them.

Please don't hesitate to contact us through our website or Facebook page for any questions, remarks or other feedback you might have and want to share with us.

Have fun in the tunnel and stay safe!

With best regards,
The Tunnel Instructor Organisation



Tunnels trained by our program

