CANOPY TRAINING MANUAL

CT 3 & 4

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STAY SAFE

BRITISH SKYDIVING

CANOPY TRAINING MANUAL

(CT3 & CT4)

British Skydiving Manual Update Policy

The British Skydiving Canopy Training Manual is updated periodically. As British Skydiving rules are continually evolving, the primary operational document, the British Skydiving Operations Manual, is regularly updated at meetings of British Skydiving Safety & Training Committee which are held every two months.

Therefore, in the case of any conflict between rules or requirements set out in the British Skydiving Operations Manual and any other British Skydiving manual, the provisions in the British Skydiving Operations Manual shall always have primacy as the definitive statement of the current position.

The acronym TAP (Traffic, Altitude, Position) was first devised by Brian Vacher's Safe Flight School in 2003. The copyright is now used by Flight-1 LLC and is used by other canopy training organisations and National Governing Bodies worldwide, as it is widely accepted as best practice when teaching awareness under canopy.

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BRITISH SKYDIVING

CANOPY TRAINING MANUAL CT3 / CT4

TABLE OF CONTENTS

SECTION 1: INTRODUCTION

WARNING

Errors made flying a canopy can be disastrous to you and others, and can result in serious bodily injury or death.

Please heed this warning! Canopy flying is extremely good fun and can be very addictive!
It is easy to become fixated or unaware of others around us.

The facts are:
1. The vast majority of injuries to skydivers are caused on landing.

2. Most could have been avoided.

3. No jumper ever sets out to hurt themselves on a jump, but lots do.

4. We all have a duty of care to those flying their canopies around us.

The intention of the Canopy Training system is to help you learn correct skills and build experience, and learn life-saving discipline in a controlled environment, so that you can continue to safely develop your skills as you change canopies, and learn new inputs.

Please do not see the CT3 and CT4 exercises as a box to be checked, these are the building blocks of precise skills that need to be honed, over time, to avoid incident.

This manual is designed to help improve your canopy skills and provide information that will assist you in gaining CT3 & CT4 qualifications. The information within each section gives you the technical knowledge required to begin high-performance landings. Specific techniques for each manoeuvre and their applications, are to be taught by an approved coach, initially under direct supervision.

You cannot learn advanced canopy skills through reading alone, this manual is designed to supplement training provided by a British Skydiving Affiliated Parachute Training Organisation (PTO) instructor or coach. It does not replace proper training or instruction. You must gain instruction and/or coaching from a properly qualified instructor/canopy training coach before attempting any of the exercises described in this manual.

The information in this manual is based on the personal opinion of the authors. Whilst all efforts have been made to ensure that it is correct and up to date, it may contain information that is incorrect and / or out of date. This manual will be periodically reviewed, if you have any comments please contact the British Skydiving Canopy Working Group via your Chief Instructor and changes or updates can be made.

The Canopy Training Syllabus

The requirement for Canopy Training 3 (CT3) and Canopy Training 4 (CT4) are set out in the British Skydiving Operations Manual section 2. Each requires a briefing before each set of exercises is to take place, along with a written exam based on information in this manual and what is experienced during the exercises.

CT3 and CT4 replaced previous Canopy Piloting qualifications CP1 & CP2. The new qualifications are designed to teach you how to learn high-performance (or induced speed) landings, in more realistic and gradual portions. The road to high-performance landings should be taken with great care, patience, and attention to the fine details. You should not attempt any of the CT3 or CT4 exercises until you have the relevant experience and have received the necessary coaching.

Previous CP1 or CP2 qualifications (or progress made towards those qualifications) may be converted into the new system at the discretion of your CI.

Requirements to gain CT3 and CT4

Canopy Training 3:

CT3 is your first introduction to high-performance landings and turns up to 90 degrees. This will start with a number of straight in approaches, under the direct supervision of a coach, followed by a number of skydives during which you practice the new skills. After that, you will need to complete some check-out jumps with a coach supervising before being able to add rotation to your landing.

Following a number of jumps under supervision, you will again carry out further jumps before some final check-out jumps observed by a coach.

CT3 requirements

- Proficiency at conducting canopy drills (dive recovery techniques, straight and approaches up to 90 degree turns) at altitudes above 3,000ft AGL.
- Proficient, high-performance landings, using front risers during a straight on approach, on at least 50 consecutive descents.
- Proficient, high-performance landings, using a front riser/harness to create a final approach turn of up to 90 degrees, on at least 100 descents.
- A CT3 written examination.
- Initially in air drills and high-performance landings must be supervised by a CI nominated CT coach or equivalent. A CT3 coaching student may then practise their skills. The CT Student must not progress to the next stage unless a CI nominated CT coach or equivalent has endorsed Form 248.
- It is important to note that until you have been awarded CT3, you must not attempt unsupervised high-performance/swoop landings. Skills should only be practised at a PTO where a CT coach or equivalent is available for guidance. This is for your safety and the safety of others in the sky with you.
- CT3 written examination can be found on Form 240D

Canopy Training 4

CT4 covers high-performance landings up to 270 degrees.

Due to the increased risk of larger turns, before beginning training for CT4, you must have safely carried out a minimum of 200 logged high-performance landings since being awarded CT3, 100 of which must have been completed within the previous 12 months, including a minimum of 25 high-performance landings on the type and size to be jumped.

- You must also have the recommendation of a CI and the CT coach who will carry out your training. The coach must have observed a landing of 90 degrees and be satisfied that you are safe to begin training for CT4.

- Similar to CT3 training you will carry out coached jumps, followed by a number of individual jumps before further coached jumps. Due to increased complexity involved in larger turns the number of jumps required will be much higher.

CT 4 requirements:

- Prior to starting training for Grade 4 in Canopy Training (CT4) the skydiver must hold CT3 and 200 jumps logged high-performance landings since qualifying CT3, 100 of which must have been completed within the previous 12 months, including a minimum of 25 high-performance landings on the type and size of canopy to be jumped. They must have the recommendation of a CI and the coach who is going to carry out training and who has personally observed a landing of 90 degrees and is satisfied that they are safe to begin training for CT4.

- To obtain Grade 4 in Canopy Training (CT4) the skydiver must hold a Grade 3 in CT (CT3) and be introduced to CT4 by a CI/Advanced Instructor nominated 'D' Licence or above CP1 Grade skydiver or equivalent of proven CT instructional ability or Canopy Training coach and have a logbook endorsement from the CI/Advanced instructor, have received a full safety brief and been instructed, both theoretically and practically in canopy piloting relevant to CT4, and has successfully achieved the following:

- Proficiency at conducting canopy drills (dive recovery techniques, straight approaches and turns up to 270 degrees at altitudes above 3,000ft AGL.

- Proficient, high-performance landings, using a front riser/harness to create a final approach turn of 270 degrees, on at least 500 descents.

GARY WAINWRIGHT

Figure 1: Using rear risers on landing

SECTION 2: INTRODUCTION TO HIGH-PERFORMANCE LANDINGS

Busting the myth...

You may hear things such as 'I need to speed my canopy up to get a good landing' or 'This parachute doesn't land straight in'. This is simply not true.

All canopies will land perfectly well, when landed in the conventional manner and using the correct techniques. They wouldn't sell otherwise! Avoid being drawn into the perpetuation of myths like this, and be sure that you want to learn high-performance landings for the right reasons. If you are struggling with your landings, speaking to a coach or instructor to iron out the basics and refine your standard flare technique should be the first place to start.

So why do people speed up their canopy?

Simply put, it can be incredible fun. Skydiving is a sport rich with ever evolving disciplines, and high-performance canopy flight is one of those! Commonly referred to as Canopy Piloting/CP or swooping, this discipline is all about increasing the downward speed of the canopy during the final stages of the canopy flight, to give a much faster ground speed on landing. This can result in an extended period of fast level flight, just off ground level, before a soft touchdown. Much like birds can be seen doing, hence the nickname swooping.

GARY WAINWRIGHT

Figure 2: Extending the swoop using toggles

SECTION 3: FLIGHT PLANNING

Changes to the flight plan.

There will undoubtedly be alterations to the standard flight plan when performing high-performance landings. Any heights that you have previously used as height markers for your flight plan will need to be increased to allow for this change. With the additional speed and risk involved in high-performance landings, it is critical that the flight plan, both the path over the ground and the heights used as markers, are flown accurately and precisely.

The holding area remains largely unchanged. This is where you will practice your in-air drills, whilst maintaining your position relative to the landing area, and continuously observing the other canopies and your altitude.

The downwind leg should be similar, just started at a higher altitude. The intention is to keep these legs as direct and straight as possible, so as to be predictable to other canopies. If alterations need to be made, for example taking a wider bowed leg to adjust for height, it is better to use the downwind leg for this.

The base leg is the most important leg. It is essential that it is flown accurately and predictably, your slot in the landing stack should already be established. As you progress through the CT3 & CT4 syllabuses onto landings with rotation, this will likely combine with your final leg.

When flying the flight plan, you must be mindful to keep turns smooth, and obvious. Last minute, erratic turns are hard for others to anticipate, and may lead to near-misses or collisions.

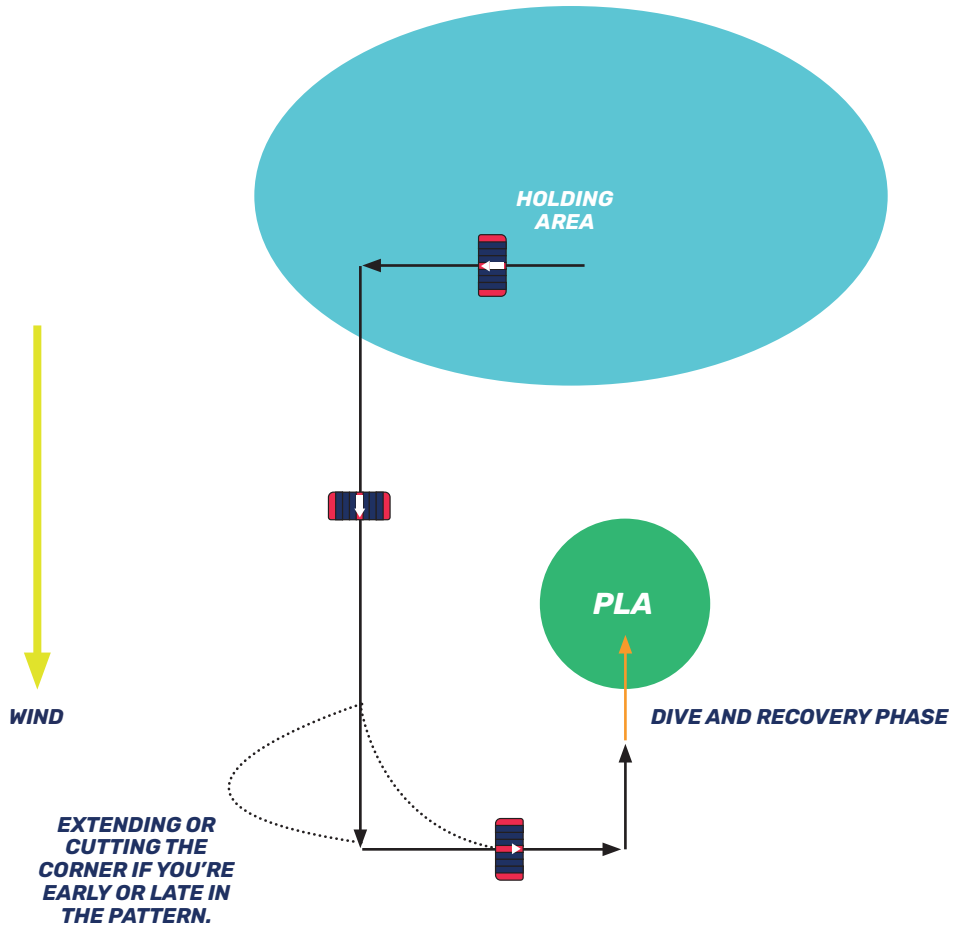

Figure 3: Standard landing pattern

Traffic Priorities.

When you perform high-performance landings, you need to be very aware of traffic. As the person doing something outside the norm, it is the responsibility of the high-performance pilot to give priority to others. Think Traffic, Altitude, Position at all times!

Before boarding the aircraft, it is wise to have an idea of what other canopies will be in the air with you, and where you will find yourselves within the landing stack.

You should not aim to race other canopies to the ground. If they are descending faster than your canopy, then allow them to land first. If you are catching up with a slower canopy, you may pass them if it won't lead to a conflict with another canopy.

When choosing a landing direction, you should follow the direction set by the CI, as diverging from this may put you and others at risk. If you are not comfortable with the landing direction, you have the option to either not jump, or not carry out a high-performance landing.

Deconflicting with other canopies.

To allow you to plan your flight plan, and assess traffic safely, British Skydiving recommends using the following landing priority assignments:

1. STUDENTS.
Student skydivers are the least experienced canopy pilots in the sky. They may be slower to react, and be less decisive when faced with close proximity traffic. As they are so new to the sport of skydiving, they are deserving of a little more space, so that they may learn safely.

2. TANDEMS.
Tandem canopies tend to be large, and comparatively docile. They need plenty of space to turn, so the instructor can focus on preparing the student for landing. Tandem canopies often need to land near camera flyers or catchers, so their landing point may be less flexible to change.

3. SPORT SKYDIVERS MAKING STANDARD APPROACHES.
Sport skydivers that are simply flying a standard pattern and landing straight in with their canopies at normal speed take priority over those that are increasing the speed of their canopy. They are not diverging from the norm; therefore, they get a higher priority.

4. HIGH-PERFORMANCE LANDINGS.
Sorry, you're bottom of the priority list! If you want to increase your chances of a clear approach, you can ask for a separate pass or use an alternative landing area (if available). High-performance landings are pushing a canopy beyond its normal flight speed, therefore artificially increasing your descent rate. For this reason, you should yield to all other canopy traffic.

Closing Speeds.

When you begin flying smaller, and faster canopies, the closing speed between you and other canopies will increase. This gives you less response time, should you find yourself heading towards another canopy. The best way to avoid this is to continuously assess the airspace around you, all the way through your canopy flight.

Failure to do this could result in a canopy collision. Canopy collisions on high-performance canopies will be violent, and due to less time and opportunity to remedy the situation, they will have much more severe consequences. You will have been taught how to respond to a canopy collision during your initial training, but it is worth discussing this further with your CI and coach, now that you may be flying smaller and faster canopies.

When to say no.

It is critical that, as a responsible canopy pilot, you know when to say no. It has long been said that the best high-performance landing you will ever do, is the one you choose not to do.

What does this mean in reality? Essentially, if something is not right, you must abort your planned landing, and perform a standard canopy landing into a safe area. There will always be another opportunity to make that turn.

If you find yourself caught in traffic when you reach your initiation point, you must abort. This is because you no longer have the clear airspace you had hoped for, and to proceed would be unsafe for you and others.

If you have not reached a point over the ground that will allow you to land into a safe area, then you must abort. To land in the wrong area, in the wrong direction or into a hazardous area is not good. To do so would significantly increase your risk of injury, and could lead to others having to make evasive actions, which endangers them.

To turn at the incorrect height will have a similar effect. Turn too high, and you run the risk of over shooting into an unplanned and potentially unsafe landing area. Turn too low and the consequences could be disastrous.

To simplify, if anything is out of sorts or not right, abort. Better to live to fly another day.

Remember, every landing can be a learning experience. Especially the ones you have to abort. You and your coach can analyse the actions that led you to that point, and plan better for next time. You can discuss adjustments to your flight plan, the location of the holding area, or the turn height, as just a few examples.

GARY WAINWRIGHT

Figure 4: Good all round awareness is important at all times

SECTION 4: THE LANDING

Introducing new canopy inputs.

There are four main methods that can be used to speed up a canopy for landing, most involving a rotation to further increase speed. The following is a description of each input, but this does not replace the need for coaching and instruction regarding specific techniques, which may vary from coach to coach.

Brake Surge.

The concept of a brake surge prior to landing is to the alter the pitch of the canopy, to ultimately increase rate of descent.

When moving to full brakes, the rapid loss of forward speed causes the pilot to swing forward under the canopy due to still holding momentum. The pilot will then start to drop back under the canopy as the momentum dissipates, and the nose moves forward, settling into slow flight.

Raising the brake toggles at the correct time will take advantage of the pilot swinging backwards, and the movement of the nose of the canopy, to slingshot the nose further forward and create a faster descent.

ADVANTAGES.

- ↘ Uses toggles – A control input that you are familiar with.
- ↘ Often used as a pre-cursor to front riser input – a good starting block.

DISADVANTAGES.

- ↘ Requires you to start input close to the ground. Misjudging this could lead to injury.
- ↘ Initiating a brake surge in traffic can be difficult for others to predict, and must be avoided if it will affect the flight plan of another jumper in any way.
- ↘ Lack of pressure in the canopy due to toggle input makes dive recovery less effective, and increases vulnerability to turbulence.
- ↘ Brake surges can be used as an intro to higher speed landings, but should only be done so under direction of a coach, and removed from general canopy traffic.

Front riser input.

Most high-performance landings are executed using front risers. This involves pulling the front risers down, to alter the pitch of the canopy, and therefore increase airspeed.

When the front risers are pulled down, the A & B lines are pulled down. This has the effect of moving the nose and the front half of the canopy lower than when in full flight. This causes the canopy to dive quicker and harder.

A word of caution, if too much input is applied, then there is a possibility that the top surface of the canopy could be pulled down and exposed to the airflow. This would cause the nose of the canopy to immediately roll under. Some older canopies are more prone to this than others but turbulence could make this happen to any canopy. The depressurisation of a large section of your canopy, combined with a sudden increase of drag on one side can have a less than desirable result! Check with your coach that your canopy is suitable for this type of input.

ADVANTAGES.

- ↘ Builds speed quickly and aggressively.
- ↘ Doesn't require any form of rotation or turn to build speed.

DISADVANTAGES.

- ↘ Extra speed means less time to react, and therefore a potentially smaller window to recover from a dive. This should be considered when determining initiation heights.
- ↘ Riser pressure builds up quickly, due to increased airspeed. Using front risers requires good strength and technique, especially on larger canopies.
- ↘ Risk of nose roll in turbulence on some older canopies.

Harness input.

Harness inputs are a highly efficient method of turning, as they do not change the shape of the of the canopy as much as other inputs. The input is created by shifting your weight through the harness. Generally, harness turns are more effective on smaller canopies, especially once the slider has been stowed and the chest strap loosened off. Whilst they do work on larger canopies, the response tends to be less effective. Harness input can be used to initiate a turn as well as enhance or extend the heading change of another type of input such as toggle, rear riser or front riser.

ADVANTAGES.

↘ Aerodynamically efficient – Allows the least distortion of the canopy.
↘ Not strength based. Relies solely on shifting weight in the harness.

DISADVANTAGES.

↘ Requires lots of practice to master – Poor technique can offer varying and inconsistent results.
↘ Less efficient on larger canopies.
↘ Only builds speed whilst turning.

Rear riser input.

Rear risers are often used to plane out the canopy during the later stages of a high-performance landing, but they can also be used to initiate a turn for landing.

When pulling on the rear risers, the C&D lines attached to that riser are all pulled at once, making a less dramatic change to the shape of the canopy than when using toggles, therefore creating less drag when using this turn input, compared to a toggle input.

ADVANTAGES.

↘ Less change in the overall shape of the canopy.
↘ Small amounts of input generate a powerful response.

DISADVANTAGES.

↘ Short control range increases risk of stalls.

Whilst rear risers can be used to level out the canopy, they are not an effective input for dive recovery. Should you find yourself low during the turn, you must use toggles to recover from the dive, immediately.

Landing Priorities.

You should already have been taught landing priorities.
To recap, these are:

1: LAND UNDER A FLAT, LEVEL, FLARED CANOPY.
2: LAND INTO A HAZARD FREE AREA.
3: LAND INTO WIND.

Remember that whatever happens on any jump you must land the canopy and do it safely to be able to jump again. Therefore, whatever flight plan you have flown or wherever you have ended up these priorities must be applied in this order wherever you land, every time.

Land under a flat, level, flared canopy.

Flat - The canopy must have recovered to its normal flight. Remember, you could have made a turn, and removed the input but the canopy is still diving towards the ground. As you progress through the CT3 & CT4 syllabus, the time it takes for a canopy to recover may increase.

Level - There should be no asymmetry in any input being applied by toggle, rear riser or harness input.

Flared - By flaring the canopy, you will be slowing both its forward speed and rate of descent, allowing you to complete and a good landing, with the least groundspeed. This means if you are to hit anything, be it the ground, or a hazard it should be at a lower speed.

You must not attempt to make a turn close to the ground that you cannot complete. Meaning that the canopy has sufficient time to recover back to normal flight.

Land into a hazard free area.

At this stage, and certainly before starting CT3 & CT4 progression, you should appreciate the importance of knowledge of the PLA, and knowing where you can land safely if you cannot make the intended landing area.

When carrying out high-performance landings, you will be flying faster on landing, meaning any impact will have more energy.

PLAN AHEAD, AVOID HAZARDS EARLY.

Land into wind.

You will see some high-performance canopy pilots landing in directions other than straight into wind. This can be for a variety of reasons, that you can discuss with your coach.

You already know that the canopy loses more height and gains speed in a turn. Therefore, when learning these manoeuvres, you should plan to land into wind where possible. Flying into wind slows your ground speed down, and gives you more opportunity to learn how to react to your new and increased ground speed.

However, if you have made a mistake with the landing direction, you must resist the urge to try and turn back into wind.

Landing downwind or cross wind are acceptable, with prior agreement/permission from the CI and your coach. The canopy will fly the same, it is just the ground speed that will change your perception. Landing in alternative directions should generally be on a separate pass, or into a separate landing area.

GARTH BARKER

Figure 5: A good landing with the canopy fully flared. Having a coach regularly watch your landings can help progression

Initiation point.

The key to a successful high-performance landing is choosing a suitable initiation point, and arriving there at the correct altitude to carry out the manoeuvre. For this reason, having great foundation canopy skills and flying a consistent pattern is critical.

By improving your canopy skills so that you can maintain your position in the landing pattern, whilst flying a safe and consistent flight plan, you will improve your ability to arrive at the correct initiation point, at the correct altitude.

Digital altimeters assist with accurately determining altitude, though care should be taken they have been read correctly, especially when read at an angle or with a smaller display area.

Audible altimeters can help with consistently turning at the correct altitude; however, these do not replace the need to TAP before starting any input. If you miss your initiation height for your turn, you must show you have the discipline to abort the planned landing.

Diving the canopy.

When starting a high-performance landing, the aim is to dive the canopy until it reaches its maximum speed, before any rotation begins. However, if the dive is held for too long, due to the increase of airspeed the canopy can begin to recover. If you rotate too quickly the canopy will not yet have reached its maximum speed.

You can use a brake surge to lighten the front riser pressure, and make input easier, which in turn increases the dive angle. However, this should never be done in close vicinity of other canopies as this is an aggressive and unpredictable canopy input.

During the dive stage of a high-performance landing, the nose of the canopy will point more towards the ground than when in level flight, resulting in an increased air speed. The canopy will travel further across the ground in a particular direction, depending on wind conditions, but will also lose altitude much faster during a dive, so a dive should not be used purely to encourage forward movement against the wind.

Rotating the canopy.

The purpose of the rotation is to generate the maximum amount of speed for the number of degrees rotated, by taking the speed generated during the dive phase and then increasing this further. There are a variety of techniques discussed earlier, detailing which inputs can have this effect on the canopy.

You can stop the input at any time during the rotation if you believe you are too close to another canopy, are too low, or will land too close to a hazard.

During the dive, the pilot will be mostly still be beneath the parachute, relative to the ground. As the rotation begins, forces involved will cause nose of the canopy to point further towards the ground, causing the pilot to swing out from the central axis.

It should be noted during the diving and rotation of the canopy, it will be moving across the ground. This lateral distance can cover a few hundred feet especially on a 90-degree turn. It is therefore important that the abort areas (marked in red) are clear of any hazards (major, minor or temporary) in case they are needed for aborting or overshooting.

Recovery of the canopy.

The recovery stage, sometimes referred to as roll-out, is an important stage for building power. When rotational input ceases, the pilot must swing back beneath the canopy, which will allow the canopy to smoothly translate the vertical speed into horizontal distance.

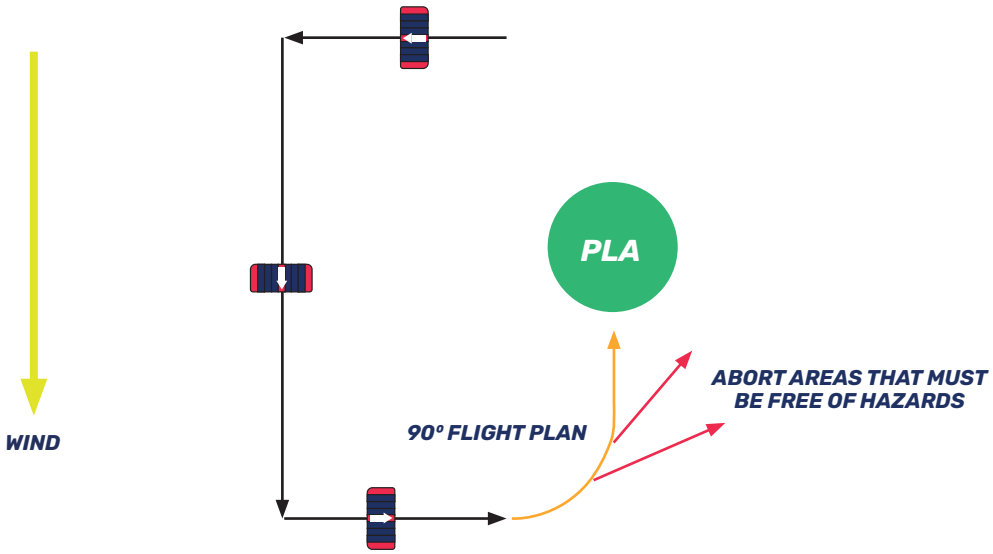

Figure 6: A good flight plan will have considered options for overshooting or aborting the landing

If uninterrupted and allowed to happen naturally, this momentum causes a further and final acceleration, when timed and executed correctly. Think of the recovery phase as consolidating all of the previous effort, into a final push towards the ground.

At higher wing loadings, it takes time for the canopy to transfer the downwards momentum into forward speed, this means that although the canopy may look and feel level, you will still be descending rapidly for a short amount of time after input is removed. This is why when beginning to learn a new turn it is expected that you will finish slightly high, the intention being that this gives you a safety margin for several jumps until you build consistency, and understand the new flight characteristics. Some canopies will take longer to recover, and a canopy with a shorter recovery arc will mean you have less time to assess and decide upon any corrective action. Take the time to discuss the correct choice of canopy with your CI, and a respected coach.

Braking Input.

The canopy should level out across the ground naturally, refined with the use of a good two-stage flare.

Initially you should use toggles only at this point. You may later also use rear risers to increase the horizontal distance if your canopy has levelled out at the correct height, before transitioning to toggles. This transition from rear risers to toggles needs to be briefed by your CT coach, practiced up high and only used when consistently achieving a competent landing, arriving safely to ground level.

Should your landing direction be not entirely into wind, whilst applying braking input, you should continue to fly in the set landing direction. You should not tweak the canopy more into wind, as this may cause you to fly into the path of a canopy landing after you. Remember, remaining predictable at all times is critical!

EMMA REYNOLDS

Figure 7: Using rear risers to extend the horizontal distance covered during the landing

After Landing.

Once you have landed, the temptation can be to set your brakes and sort your slider, going about your own business. However, your first priority should be to turn to face the incoming traffic, to check that another canopy isn't landing close to you.

All canopy pilots should aim to have 10 metres clear either side of their intended path. If you think that someone will land too close to you, then you can sit, kneel or lay on the floor to avoid a collision.

When walking back from the landing area, remember to stay observant. If you need to move across the high-performance landing area, treat it like you are crossing a runway. Be sure to look both left and right, as well as upwards in the direction of traffic, and be sure that you won't become an obstacle for someone else to avoid, before crossing.

EMMA REYNOLDS

Figure 8: Watching for other jumpers straight after landing can prevent collisions

SECTION 5: SURVIVAL SKILLS

Dive Recovery.

At some point, you will make a low turn. What is important is that you survive, so that you can learn from it.

Should you make a low turn, the sooner you can recognise this, and start dive recovery, the better. If you practice recovering from a dive the likelihood of a dive resulting in serious injury is dramatically reduced.

Immediately releasing the front risers will allow you to keep your hands down, ready to pull both toggles downwards aggressively, to abort the dive. Both toggles should be pulled down towards the hips, enough to stop the dive, being careful to keep the input even on both sides. Be prepared for much higher pressure in the controls, due to increased airspeed.

A short, sharp jab on the toggles is usually enough to bring the canopy back above your head, and potentially save your life. This can only be effective if dive recovery is started with sufficient altitude to be completed, before reaching the ground.

You must practice this drill for every type of turn, rotation or new style of landing, and each time you change canopies. The response, reactivity and sensation will vary with each canopy you may fly.

GARTH BARKER

Figure 9: Learning dive recovery techniques

Dealing with Turbulence.

In some situations, turbulence can cause a canopy to collapse, or lose its normal shape. Because this can be startling, skydivers will generally focus on the need to keep a canopy pressurised in turbulent conditions. Most modern canopy designs will handle turbulence better while flying at full speed, or normal flight. Contrary to older beliefs, a modern canopy may actually experience more significant effects from turbulence if flown with brake input applied.

It is also important to be aware that a canopy can still be affected by turbulence, without collapsing or distorting. Turbulence may cause sudden heading changes or a rapid loss of altitude, even without any noticeable change in the shape of the canopy. These effects can be explained as sudden changes in airspeed or angle of attack affecting either the entire canopy, or part of it. Safely flying, and landing, the canopy should be your main priority in turbulent conditions.

If the canopy suddenly starts to turn, dive, or drop you must be ready to react to these changes and keep the canopy on your intended heading, especially if this happens near the ground. If the canopy does start to distort or collapse, in most cases only part of the canopy is affected and it should quickly recover on its own.

If turbulence does cause the canopy to start turning or diving near the ground, use smooth but deliberate toggle inputs to:

STOP OR REDUCE ANY SUDDEN LOSS OF ALTITUDE.

KEEP THE CANOPY LEVEL, AND ON HEADING.

KEEP THE CANOPY FLYING TOWARD A CLEAR, SAFE LANDING AREA.

You should be ready to take any or all of these actions, should you encounter strong turbulence close to the ground. However, it is not necessary to react to every small bump you feel, you will learn this over many skydives on the same canopy. Flying at full drive will usually reduce the amount of turbulence you feel in the first place, and make the effects less harsh. However, you must still flare for landing!

High-Performance Landings & Turbulence.

Skydivers carrying out high-performance landings will sometimes encounter less turbulence than skydivers making standard landings. Whilst this seems to suggest that there is an advantage to faster landings in turbulent conditions, there also disadvantages.
Firstly; if you don't normally carry out high-performance landings, a gusty or bumpy day is not really the ideal time to start! Why? A canopy can be more vulnerable to turbulence during a turn. Whilst the speed of the wind itself will not change the aerodynamic performance of the canopy, unlike a calm or consistent wind, turbulence can affect the length of the recovery arc.

Turbulence can be difficult to predict, so you should take extra care on very warm days, gusty days and when landing downwind of larger structures. If you feel the front riser pressure suddenly decrease during a high-performance landing, you should smoothly release the front risers and attempt to abort the landing.

Every skydiver should understand the advantages and disadvantages of the canopy they choose to jump and the particular risks that they may face when flying in turbulent conditions. Discuss this with your CI when choosing a canopy.

The Importance of Good Judgment.

Always consider the weather conditions and the amount of risk you will face by jumping in those conditions.

HOW STRONG ARE THE WINDS?

ARE THEY A LOT STRONGER THAN ANY YOU HAVE JUMPED IN BEFORE?

ARE OTHER SKYDIVERS STRUGGLING WITH THE CONDITIONS?

Consider your current skill level and experience.

ARE JUMPERS WITH MORE EXPERIENCE THAN YOU STAYING ON THE GROUND?

IS IT REALLY WORTH TAKING EXTRA RISKS JUST FOR A FEW SKYDIVES, OR IS IT BETTER TO WAIT UNTIL THE CONDITIONS IMPROVE?

Even if the PTO is willing to send a load up, and others are willing to jump, you shouldn't feel pressured to jump, or obliged to trust other people's judgement if your own instincts are telling you to stay on the ground.

Landing Off and Reserve Rides.

Off landings and reserve rides are unplanned occurrences, that we must prepare for. As a rule, when landing off the PLA or when landing your reserve, you should not be performing high-performance landings.

Why? When landing off the PLA, you cannot be certain of the surface you will land on, and there may be hidden hazards that you cannot easily see from above. You do not want to be injured, and away from help.

When it comes to the reserve parachute, there are several reasons. Firstly, how often do most people fly their reserve? Hopefully, not often! This means that you most likely won't be overly familiar with how the canopy flies and responds to control inputs, how it recovers from a dive and how much height it loses in a turn. Couple that with the fact that many reserves are smaller than their counterpart main canopy, there are far too many new and unknown factors to make a high-performance landing a safe or sensible choice.

NICK ROBINSON

Figure 10: Landing your reserve safely on the PLA is always a relief!

SECTION 6: RESPONSIBILITIES

Responsibilities.

Whilst training for CT3 or CT4, you are permitted to carry out high-performance landings under varying levels of supervision, and once you achieve the qualification, you may exercise those privileges unsupervised.

However, you must remember, you never have an unchecked right to a high-performance landing. Your only right is to land safely, and the same applies to those flying around you.
If you see or experience something dangerous, you should speak to an instructor or your CI, you may well prevent a future accident.

Ask yourself:
DID I LAND SAFELY WHERE I INTENDED?

DID I DO THAT WHILST FLYING A PREDICTABLE PATTERN?

DID I GET AFFECTED BY SOMEONE ELSE'S PATTERN? DID THEY REALISE?

DID I DO ANYTHING TO COMPROMISE OTHERS SAFETY OR ENJOYMENT?

Be honest with yourself, if you are not happy with your landing, seek advice from a coach. If someone points out that you may have made an error of judgement, be humble and seek qualified advice. Never stop learning.

Human Factors.

Your overall responsibility starts before you jump. Regardless of how well you plan or prepare, simple human factors can impact performance and lead to complications. The list below covers some common factors, but you will know yourself better than any coach or instructor, so be honest and stand down if you notice a drop in awareness.

Some skydivers are professionals, making hundreds of skydives each year, others are recreational skydivers, perhaps doing less than 100 jumps a year. No matter which category you fall into, when you are learning something new, you will do so more efficiently and safely, when you take these factors into consideration.

On many skydives, a small dip in your performance might only hamper your progression or the quality of your jumps slightly. However, when carrying out high-performance landings, this could be a contributing factor in an incident that may cause harm to yourself and others.

↘ SLEEP

Having a good night sleep before skydiving is an important factor than can ensure the body is prepared for the day ahead. Many studies have shown a clear link between sleep and performance in sports. Moderate sleep deprivation can cause slowing of reaction times to the same level as a drunk driver over the blood alcohol limit. Not a great combination with high-speed canopy flight!

A good night's sleep after a busy day of jumping can also help the brain process the skills and abilities learnt during the day. Care should be taken when waking up early and driving a long distance before a busy day jumping, as your abilities may begin to lag as the day progresses. Driving up the night before may be beneficial for maximum performance.

↘ HYPOXIA

When skydiving at 15,000 feet we have a reduction in the available oxygen for the body to use, although hypoxic effects can begin as early as 4,000 feet. Sometimes when under canopy due to stress we may have held our breath, so taking a breath in these conditions and making a conscious effort to control breathing can reduce the likelihood of this occurring. On the aircraft ride to altitude, we can reduce the amount of oxygen the body requires by minimising talking and unnecessary movement.

Smoking directly before skydiving also has a detrimental effect to the body's ability to absorb oxygen.

↘ ALCOHOL
Consumption of alcohol before skydiving is prohibited, but also care should be taken that over indulgence the night before does not leave a skydiver still under the influence. It should also be noted that alcohol also negatively affects the quality of sleep.

↘ FEAR/EMOTION
Part of the thrill of skydiving is not the absence of fear, but the challenge of facing the fear. Fear is a normal survival emotion but, in some cases, too much can affect the brain's ability to think logically. However, in extreme situations fear can trigger a variety of actions. High energy fear reactions such as Fight or Flight can cause over aggressive canopy inputs. The freeze fear reaction can even lead to no input when a necessary reactionary input is required.

Times when we are likely to encounter more fear than normal include jumping new canopies, visiting a new PTO, skydiving after a layoff, or jumping in increasingly large freefall groups. When facing these situations, it's easier to take a step back and turn everything down a notch till this is overcome. Fear will decrease gradually with exposure. Lack of fear can cause boredom, or worse; complacency.

Fear should be differentiated from other life or emotional stresses. Skydiving is a great escape from real life, though when under a great deal of emotional stress, we might not perform at our best, and sometimes its better leaving the kit at home and visiting the PTO just for socialising.

↘ TRAINING
Skydivers perform at their best when skills are kept current by regular jumping. Gaps in training regardless of the cause, can lead to skill fade which may take a few jumps to regain. This currency should be re-established before moving to learning new skills, or jumping new canopies. This is critically important when fast high-performance canopies are used. Lack of currency might also require the use of larger canopies and advice from instructors and/or CT coaches should be sought.

Remember you are only as current as your last flight. If has been a while don't try anything new and be cautious!

All skydives including canopy flight pattern must be rehearsed for best performance. This should happen both on the ground and also visualised in the aircraft before exit.

↘ ENERGY
A busy day of skydiving can cause the body to consume a larger amount of energy then normally required. A supply of food and snacks on standby is a good idea.

Also be aware that especially in the early stages of progression skydiving can be physically and mentally exhausting, and sometimes it's better not to push for one last jump.

↘ DEHYDRATION
It's important to keep the body hydrated throughout a jumping day. Dehydration has a negative effect on how the body can perform physically and mentally; potentially causing dizziness, lack of concentration, increase of stress hormones, decreasing the ability for the body to control temperature, and reducing co-ordination to name but a few. Be extra mindful on warm, summer days!

↘ Ego is the enemy
As well as learning the skills of how to perform a high-performance landing and developing the necessary experience, the core skill of self-discipline is arguably the most important. However, one of our biggest enemies in this journey is our ego and the lack of self-awareness.

As human beings, we are often the worst judge of our performance, actions and abilities, but fear asking others as the feedback may harm our ego. It is this feedback, when given and taken constructively, that will allow you to progress the most. There is no short-cut to learning the art of high-performance landings, because regardless of any freefall ability, for each skydive we can only perform one landing.

At times progress can plateau, but discipline ensures we keep our focus on our steady and smooth progression, not looking to blame other external factors. Your individual self-worth as a skydiver is not determined by the size of your canopy, your rotation of turn or by how fast you learn to do a 270.

Being skilled at high-performance landings doesn't make you a better or cooler skydiver, despite what your ego might be telling you. In actual fact, caving to your ego can result in having the opposite effect, whilst endangering yourself and others around you.

If you ever have to cherry pick to find someone who will let you downsize or progress to your next rotation, then this is your ego trying to take control. Ego will stop you aborting when you need to and generate an attitude that your landing is more important than everyone else's right to safety. Ego will make you feel you need to jump a certain size of container or canopy. Ego will tell you that you must progress on the minimum number of jumps or that you need to be on a certain rotation by X number of jumps. Ego will try to make you downsize too quickly, rush through the progression, blame anything rather than take personal responsibility. Ego is the enemy to your progress and has killed and injured many skydivers over the years.

But it is only when you let go of your ego and all of your excuses that you will find the best results.

GARY WAINWRIGHT

Figure 11: The authors, Nick Robinson and Ally Milne flocking with Gary Wainwright over Langar

SECTION 7: MORE DETAILED CANOPY INFORMATION

Differences between canopies.

These five factors are the main things that canopy designers are able to alter in order to achieve differing flight characteristics when creating canopies.

↘ AEROFOIL

The aerofoil is the cross-sectional shape of a wing. It's curved surface creates the lifting capability of a canopy. From a jumper's point of view, the aerofoil mostly affects the landing and stability of a canopy. There is also a slight effect on the speed, but not as much as most people think.

↘ TRIM

The trim refers to the nose-down angle of the canopy, which creates forward motion. This trim angle is built into the canopy by varying the length of each row of suspension lines. A canopy must be trimmed within a certain range in order to fly, pointing the canopy more nose down results in more speed but a poorer glide, while more nose up results in a flatter and slower glide.

↘ ASPECT RATIO

This is the relationship of the span (wing-tip to wing-tip) of a canopy to its chord (front to back) measurement. A canopy 15 feet across and 10 feet from nose to tail has an aspect ratio of 15:10, or, expressed in its lowest form, 1.5:1.
For a skydiving canopy: 1.9 is a low aspect ratio; 3.0 would be considered high.

↘ WING-LOADING

Wing-loading is the largest contributing factor relating to speed, and rate of descent. In addition to the speed, wing loading will also affect the overall handling of a canopy.

To calculate wing-loading, you take the overall exit weight of the jumper in pounds (lbs), and divide it by the size of the canopy to be used. The overall exit weight must account for all clothing and equipment the jumper will leave the aircraft with, including rig/helmet/weight belt etc

For example, a jumper weighing 175lbs clothed, with 20lbs of equipment, would have an exit weight of 195lbs. Flying a 150sqft canopy they would have a wing-loading of 1.3 lbs/sqft.

$$\frac{\textbf{195}}{\textbf{150}} = \textbf{1.3}$$

(EXIT WEIGHT - in lbs to include all kit and weight belt) / ***(SIZE OF CANOPY - in square feet)*** = ***(WING LOADING - lbs per square feet)***

A lower wing-loading creates slower flying speeds, a more gradual rate of descent, less responsive control inputs, slower landing speeds and an overall more forgiving canopy ride. A higher wing-loading creates higher speeds, more rapid rate of descent, very reactive control inputs, faster landing speeds, and is less forgiving of errors.

↘ WING PLANFORM

The shape of the canopy when viewed from the top down, is referred to as the wing planform.
Most modern canopies use a fairly rectangular planform, commonly referred to as square.
This shape and the variations applied to it, creates different handling and performance.

Elliptical vs Non-Elliptical.

You will hear other jumpers talking about elliptical and non-elliptical canopies, and which they perceive to be higher performance, or generally better. There are a few common misconceptions about elliptical canopies, so it is important to be clear on the facts.

The term 'Elliptical' refers to the planform of the canopy, the top-down view, and describes the level of taper to the corners of the canopy. If you were to have two canopies that have the exact same aerofoil, aspect ratio, trim and wing-loading, but one has square corners (rectangular/square canopy) and the other has far more tapered corners (elliptical canopy), the comparison would look like this:

The elliptical canopy will start a turn much quicker, and usually requiring less input. This applies to slow flight as well as full flight.

The elliptical canopy will usually recover from a turn slower and hold its speed longer after controls are returned to the neutral positions.

The elliptical canopy is more sensitive to body position and weight shifting in the harness.

In general, all of these characteristics become more pronounced as the canopy corners become more tapered. A very slight taper feels similar to a standard square cornered canopy, while a canopy with a severe taper can be complex to fly without great skill.

However, it is worth noting that some of the most well-known high-performance canopies have only slight tapers to their corners, and some canopies seen as intermediate canopies have slight tapers too. When it comes down to it, it is more important to consider all flight characteristics of a canopy, and not get too caught up in the myths surrounding shape.

Canopy size and Wing loading.

Generally, the higher the wing-loading, the lower the margin for error and the more severe the consequences of an error. Only move to a smaller canopy if you and your coach/CI are satisfied that you are absolutely able to handle the responsibility of the greater speeds involved.

Only go one size smaller at a time, and when changing canopy model, you should stick to the same size.

There are people that claim that a wing-loading must be very high on a high-performance canopy, in order for it to open and fly correctly. This is simply not true. A larger high-performance canopy will offer a little less speed, but more forgiveness than its smaller models.

Whilst it is true that there is a wing-loading which is so low that the canopy becomes difficult to fly in high winds and turbulence, that wing-loading is far, far lower than most people imagine, and it is rare that you could get that low with high-performance canopies.

A great example of this would be student canopies. They open, fly, turn, and land perfectly well. Most of these will be loaded comfortably below 0.8 lbs/sqft.

Different Equipment.

↘ REMOVABLE SLIDER

Some high-performance canopies can be equipped with a removable slider. The slider material attaches to metal rings, and can be released by pulling one or more drawcords that attach to the release system. Removing the slider allows the canopy to spread further, much like loosening the chest strap, and removes a source of drag.
Whilst removing the slider has benefits, it can be awkward to get used to, and requires somewhere secure to stow it, so you don't drop it. The main concern would be the distraction whilst removing it, meaning you're not checking your airspace.
If not rigged up correctly, a removable slider can cause malfunctions.

↘ REMOVABLE DEPLOYMENT SYSTEM (RDS)

Very high-performance canopies can take things one step further than a removable slider, and have a

full RDS. This has a lanyard that attaches the deployment bag and pilot chute to the slider, rather than the top skin of the canopy. This removes yet another source of drag, allowing the canopy to fly faster. However, it can take much more time to reel in a full RDS, meaning a greater loss of time and altitude, before the brakes can be released. As with a removable slider, the rigging of a full RDS must be done with care, as a misrouting could result in a malfunction.

↘ CROSS-BRACING

On cross-braced canopies, each cell is divided into three chambers instead of two, with the chambers diagonally braced to force each cell back into shape.

The canopy is more rigid in flight due to the reinforced structure, and the canopy surfaces appear smoother or less distorted. Basically, you get a more responsive, faster, more rigid, stable and powerful canopy.
However, there are a couple of unavoidable disadvantages to cross-braced canopies. Because cross-braced canopies have an increased amount of material, a cross-braced canopy could pack up much bigger. You may go down in size, but end up with a canopy that packs tighter than your current one!

Cross-braced canopies have more fabric and take a lot longer to manufacture than a conventional canopy. As there are often less line groups, the loading is a little higher on each line attachment point so reinforcing is sewn throughout the entire parachute. This increase in material and labour will mean that cross-braced canopies cost more to purchase.

↘ TAIL RIBS

The small tail ribs featured on some modern canopies reduce aerodynamic drag and help the canopy generate more lift; therefore, improving low speed performance.

↘ BELLY BANDS

Competitive canopy pilots will sometimes completely undo the chest strap, to allow them to make extreme changes to their body position in the harness. This will only be done when a belly band is fitted, essentially doing the job of the chest strap, but much lower on the harness. Belly bands must not be used unless cleared and fully briefed by a CI, and built by an advanced rigger or container manufacturer.

EMMA REYNOLDS

Figure 12: Using a belly band allows the jumper to lean forward to reduce drag during competition

Downsizing.

It's hot topic on every DZ, in every corner of the globe. Be it on the packing mat, in the bar or on the flightline, you will hear people talking about it sooner rather than later! Nearly all skydivers face the downsizing decision at some point in their skydiving careers.

Bearing in the mind that the majority of incidents in skydiving occur under fully open (and fully functional) canopies, it is important to think about when it might a good time, or a bad time, to downsize.

So, before you think about talking to your CI and coach about downsizing, here are some questions you should ask yourself first:
Do I really need to downsize?
When you ask a coach or instructor about downsizing, the first thing they will ask you is probably "Why do you want to downsize?"

MANY PEOPLE DON'T KNOW HOW TO ANSWER THIS QUESTION.

Ask yourself:

1. Are you current on your canopy?
2. Are you flying a good pattern with consistency and being predictable under canopy?
3. Are you normally landing with reasonable accuracy in varying conditions?
4. Are you landing well, i.e., standing up each time?
5. Are you comfortable in a close stack or congested traffic?
6. Are you confident of landing well in the extremes of the conditions that you jump in? Can you handle a nil wind landing or control one at the upper limit of your wind conditions?
7. Can you handle the canopy if you misjudge something, such as landing crosswind?
8. Can you fly the canopy well in slow flight?
9. Would you be confident landing off the main PLA or DZ?
10. Will you be able to remain current on your new canopy?
11. Are your landings consistently safe at this stage of your CT3 or CT4 progression?
12. Are you able to recognise when you have insufficient altitude to complete a manoeuvre?

OR... IS IT BECAUSE OTHER PEOPLE ARE TELLING YOU THAT YOU'RE READY TO DOWNSIZE?
ARE YOU IN A HURRY TO DOWNSIZE SO YOU CAN EVENTUALLY LEARN HIGH-PERFORMANCE LANDINGS?
BE HONEST... DO YOU WANT TO LOOK "COOL" UNDER A SMALLER, FASTER CANOPY?

Now ask yourself: ***ARE MY REASONS ACTUALLY GOOD ONES?***

You can often move to a different model of parachute and find something that's going to be more fun, potentially faster, and more exciting to fly without necessarily having to downsize to a smaller canopy.

Do I understand which performance factors will change with a new canopy?
There are many things to consider when deciding whether to downsize. This can include what canopy you're currently jumping, how many skydives you have overall and how many on your current canopy, how often you jump and what your goals are, to name just a few.

You'll also need to think about the type of canopy you plan to switch to:

IS IT ELLIPTICAL?
IS IT CROSS-BRACED?
IS IT A 7 CELL OR 9 CELL DESIGN?
HOW STEEP IS THE TRIM ON THE NEW CANOPY COMPARED TO YOUR CURRENT ONE?
DO YOU UNDERSTAND HOW THESE FEATURES AFFECT PERFORMANCE?

Then think about the size of the new canopy. You'll experience higher performance under any canopy that is smaller than what you've flown up to this point, no matter what size it is. Smaller canopies are more responsive to input, meaning the effects of small errors that may go unnoticed on larger canopies, are amplified as the canopies get smaller.

Do I have enough experience under my current canopy?

People often make the mistake of downsizing to improve performance instead of working to improve their skill level, to achieve the same, if not better, results. Whatever canopy you have, any coach or instructor watching you from the ground should see you land, and believe that you can fly your canopy safely in any situation that you may be confronted with. Until then you probably don't need to be downsizing or changing models to something higher in performance.

Experience takes time. It is not gained over a handful of skydives, or even hundreds, but over months, years and sometimes decades of learning, training and practicing. A combination of a good solid base of experience, knowledge and discipline, is what great skydivers need to be able to fly their canopies in any jumpable conditions.

Can I comfortably land my current canopy in conditions that are less than perfect?

Landing is easy when you know the landing area well, the winds are light and consistent, or when there is no traffic. But what if the conditions are less than ideal? How about when there is no wind, or you are forced to land with a crosswind? What if someone flies in front of you when you're landing? Don't assume that just because you know your home landing area well, that you'll be safe under a smaller canopy. The reality is you can't control the actions of others, and you can't control sudden changes in weather.

Have I asked advice from the right instructors and coaches?

Asking the right people, the right questions will help you massively. Don't ever assume that that the people offering you advice on downsizing actually know what they're talking about. Consider the people you're talking to. Are they reputable and experienced canopy coaches or Instructors? Do they have good track records for safety? Seek out appropriate sources and advice, and listen to them.

Not sure where to look? Start by asking your local CI. They will be able to point you to the right canopy coach.

SECTION 8: GLOSSARY

Notes for coaches

As explained at the beginning of this manual, the CT3 & CT4 manual serves as a supplement to a coach's experience and knowledge. This manual was written and structured in such a way for several reasons.

Firstly, many high-profile pilots utilise varying techniques, to achieve great results. By not prescribing specific techniques within this manual, British Skydiving is ensuring that students may learn a variety of techniques from their coaches, and can identify a technique that suits them best.
British Skydiving recognises that coaches may have different methods that achieve the ultimate aim, a high-performance landing that minimises risk to all skydivers.

Secondly, the style of flying required for day-to-day high-performance landings, onto an open PLA, will vary greatly from the style used for competition. The learning journey can now be tailored to the path that each individual student wishes to take, without compromising safety or excellence.

Finally, this also allows for new techniques to be seamlessly integrated by coaches in real time, giving the best possible learning opportunities to British Skydiving members receiving CT3 or CT4 coaching.

This will also allow coaches to continue to develop their own knowledge, experience and flying styles, and pass this onto their students.

Safety Points.

Whilst the manual does not prescribe specific techniques to be used, there are safety points that must remain common across all CT coaching.

Traffic, Altitude, Position.

Skydivers must be taught the importance of constantly assessing traffic when planning and carrying out high-performance landings. It goes without saying that the consequences of a skydiver carrying out a high-performance landing without ensuring they are clear from traffic could be disastrous for multiple parties.

The use of TAP should be included in the initial CT3 briefs, and be assessed with each coached landing, and debriefed wherever possible. At each stage of progression, or any alteration to the flight plan, there should be a discussion about potential traffic issues.

Landing Priorities.

Landing priorities must be covered in the CT3 introduction brief. Meeting the first and second landing priorities (1. Land under a flat, level, flared canopy, and 2. Land into a hazard free area), are of great importance when learning high-performance landings. Stress the point to your students that if they cannot meet these basic requirements, they must abort their landing so that they may live to try again. The third and final priority (3. Land into wind), should be observed where possible, especially at the early stages. However, it is important to land in a direction that is consistent with all other canopies. Once a skydiver is showing proficiency with a particular stage of their progression, landing in alternative directions may be allowed. This should always be with CI permission, and in a pre-declared direction, under supervision.

Dive Recovery.

Dive Recovery drills must be revised from earlier CT training, and tailored to suit the canopy that your student is flying. This must be included in the initial CT3 brief, and should be revised periodically.

At some point, one of your students will make a low turn.
How you as the coach prepare them, will affect the severity of the result.

You should explain what constitutes a low turn and how they can recognise this, so they can immediately start dive recovery. Skydivers learning high-performance landings should practice recovering from a dive with each new stage or progression.

Immediately releasing the front risers will allow them to keep their hands down, ready to pull both toggles downwards aggressively, to abort the dive. Both toggles should be pulled down towards the hips, enough to stop the dive, whilst being careful to keep the input even on both sides.

Student Mindset.

Your students have come to you because they want to learn. You as the coach now need to explore their motivation for wanting to learn high-performance landings.

Your student may have genuine interest in this style of canopy flight. They may just be trying to keep up with the crowd. They may have been lead to believe that it is the only way to get a good landing from their chosen canopy. It is your responsibility as the coach to ascertain that the desire to learn is both genuine and appropriate. There may be a way of achieving their end-goal without the additional risk of high-performance landings.

Ask the student:

↘Why do they want to learn high-performance landings?
↘Do they intend to compete, or just get a bit more fun from landing their canopy?

Ask yourself:

↘Are they ready?
↘Have they shown genuine interest?
↘What is their current level of canopy skill?
↘Are they current?

Remember, if you are unsure, you should always discuss with your CI before undertaking any coaching. On a coaching day, make sure your student is alert, and prepared for a day of coaching. New information and new canopy drills can tire skydivers out quicker than they may be used to, so allow for periods of rest, consolidation of knowledge, and regular breaks for water and food to keep energy levels up. If you start to notice a drop in concentration or performance, don't be afraid to take a longer break or finish early.

Coaches Mindset.

As a coach, you also need to be alert and prepared for the day. Coaching high-performance landings requires a great deal of attention to detail, so make sure you give yourself time to brief every exercise, and to assess and debrief each landing fully.
Use the time that your student is in the aircraft to use the facilities, or to eat and drink, so that your student can be your sole focus once they leave the aircraft.

Coaches Responsibilities.

As a CT coach, you carry the responsibility of ensuring that any student you coach is suitably trained, equipped and briefed for their skydive.

You must take the time to explain each exercise in detail, and ensure that it is fully understood. This can be in the form of PowerPoint style presentations, physical practice in a suspended harness or via a walkthrough on the ground, to name a few. Confirm that they understand at each stage, and if not, more practice on the ground is required.

You should not coach students that do not have equipment suitable for the skydive they plan to make. This means ensuring that their instrumentation is appropriate (digital altimeters and audible altimeters are highly recommended), that they are using a canopy that is suitable to their experience level, and that they are not using any ancillary equipment that may distract from the plan.

A full and comprehensive brief should be given for each skydive. Talk through the flight plan, landing priorities, traffic priorities, as well as set up and initiation points. Get the student to walk through the skydive, explaining their understanding of each stage to you as they work though the plan.

After each skydive, a full debrief should take place. Take the time to be sure that your student has understood the critique, and has understood any new information. Then complete any relevant

documentation. Each successful landing should be recorded on the training record card (form 248 for CT3), and at each stage of progression the record sheet must be checked, updated and signed. A logbook endorsement for each new technique or manoeuvre is also useful, and can be used as a reference for jump numbers or in the event of a lost record card.

Ensure that your student has time to rest, and recover between skydives. This allows them to absorb coaching points from the previous skydive and to consolidate new information.

When to Stop Coaching.

It is important as a coach that you recognise when to stop coaching a student. It may be that you simply call an end to the days coaching, or in extreme cases, you decide that you no longer wish to coach that student.

As already mentioned, any drop in concentration or performance should at least mean calling a time out. By allowing or encouraging the student to take a break, you may find that they can then continue for the rest of the day. If you notice that they still aren't ready to skydive, then you might consider ending that days coaching.

Your responsibility as a coach also extends to knowing when to cease working with a student permanently. If you find yourself with a student that is consistently endangering themselves or others, despite every effort to adjust their attitude, you may be faced with no option but to step away. In cases such as these, you should report this to your CI.

Student Downsizing.

As a coach, you will be asked your opinion on downsizing. And most likely, quite frequently!
Your responsibility here lies with safety. Is the student ready? Will they be safe around others if they change canopies? Is that particular canopy the right one for them? These are just a few of the questions that need answering before you should offer advice. You should use your judgement and experience to advise the student, and discuss with the CI when faced with questions about downsizing. You may also consult form 330, and this manual, as references.

Figure 13: It's important to maintain excellent all round observation, especially when flying with other canopies