



Which way will you turn?

STUDENT HANDBOOK.

THIS STUDENT MANUAL CONTAINS 'FOOD FOR THOUGHT' AND PRACTICAL IDEAS REGARDING HOW TO BETTER SPEND YOUR TIME FLYING YOUR WING.

THESE NOTES WILL TEACH YOU SOME BASICS ABOUT CANOPY FLIGHT. THOUGH BEFORE ATTEMPTING ANYTHING NEW OR DIFFERENT, PLEASE DON'T HESITATE TO ASK YOUR TUTOR TO HELP PLAN YOUR FLIGHT.

**EDITION #1 OCTOBER 2005
ROBERT B. McMILLAN**

INDEX

AIMS	3
FOOD FOR THOUGHT	4

10 LESSONS

1. KNOWING HOW TO CRASH	5
2. ACTIVE LEARNING	7
3. PRIOR PREPARATION PREVENTS PISS POOR PERFORMANCE.	10
PRIORITIES	10
PREDICTABILITY	10
SELF TALK	11
SIGNALS	12
PERFORMANCE	13
PARACHUTE TRIM	14
FLYING YOUR RESERVE	15
THE IMPORTANCE OF POSTURE	16
A SIMPLE OBJECTIVE	21
4. SAFETY	22
5. SPOT 'N' HOP 'N' POP	25
6. APPROACHING THE LANDING PATTERN	28
7. SELECTING A RUNWAY	32
8. FLARING AND TOUCHDOWN	34
9. HABITS	36
10. GEAR INSPECTION AND MAINTENANCE	38

THE JUMPS

SLOW JUMP	42
TUTOR JUMP	45
THE FOLLOW THE LEADER JUMP	47
THE TEAM SKILLS JUMP	50
NOTES	52
FEEDBACK	53

THE AIMS OF THIS SEMINAR ARE TO

- Allow novice and intermediate canopy pilots the opportunity to spot the jump aircraft.
- Allow the completion of the B-rel canopy handling jump to complete your B license
- Promote smarter canopy skills that will assist the student to gain greater confidence while flying their wing.
- To develop better canopy briefing and debriefing skills.
- Participate in a fun accuracy competition to encourage better canopy control and to foster a competitive spirit.
- Use video as a means to review performance to accelerate skill progression.

WHAT DO I NEED TO BRING?

- Your jump gear
- A hook knife (If you have one! What could you do with it?)
- A Mini DV tape if you wish to have a copy of your jumps.
- Money for your jumps and registration.
- A smile and enthusiasm.

WHAT DOES THE SEMINAR PROVIDE?

- 5 canopy jumps from 7-8000ft.
- The opportunity to complete your B-rel canopy jump (*necessary for your B license*).
- The opportunity to spot the jump aircraft. (*Necessary for your C license.*)
- Canopy coaching from highly experienced canopy pilots.
- A copy of your landings and any jump that had video.
- A greater understanding of canopy dynamics and the best way to exercise new skills.

Food for Thought.

The following information is food for thought. Your instructor will answer the questions contained in each of the lessons in the morning session of the course. We do not wish to spend too much time in the classroom, because like you, we would rather be jumping. The time spent between loads will be productively spent debriefing the previous jump and briefing the next load.

**ESSENTIALLY THIS SEMINAR IS STRUCTURED TO
TEACH BRIEFING AND DEBRIEFING CANOPY
TECHNIQUES SO THAT YOU MAY APPLY THEM TO
YOUR SKYDIVES.**

**THERE ARE 10 LESSONS CONTAINED WITHIN
THIS STUDENT MANUAL.**

1. Knowing How to Crash.
2. Being an Active Learner
3. Priorities, Predictability, Performance and Posture
4. Safety
5. Spot 'n' Hop 'n' Pop
6. Approaching the landing pattern
7. Selecting a Runway
8. Flaring and Touchdown
9. Habits
10. Gear Inspection and maintenance

It is in your own interests to read the material before the weekend of the seminar, to help feed and fuel your hunger for knowledge. The material certainly won't answer all of your questions, though it may cause you to think of more.

After reading this material, please write down any particular questions that you can think of, and we will ensure that your questions are answered.

LESSON #1. KNOWING HOW TO CRASH.

Ever jumped in high winds wearing just a t-shirt, shorts and sandals?

Have you ever imagined what sand papering your skin must feel like?

There are several essential ingredients to crashing well. Here are just a few...

DRESS FOR SUCCESS. *By wearing appropriate clothing from the ground up.*

FEET In the seventies and eighties, jumpers around the world were wearing para-boots. They were designed to give your ankles protection from the hard landings often incurred when jumping round canopies. Today, some people will jump in anything, even bare feet! There is absolutely no point to flying a canopy of any description unless you have a good under-carriage. Look after your feet and body by wearing appropriate shoes.

BODY If you are not confident of getting stand up landings then a full covering of clothes of any description is better than having your skin feel the brunt of the earth first hand. Sometimes even a layer of clothes plus a jumpsuit may not be enough to stop your skin from being scoured.

HEAD *What type of helmet do you wear? Do you think it offers you enough protection?*

Some helmets simply offer warmth and noise reduction. Others offer full-face protection. Some have a large impact absorption zone; others have very little at all. When you choose a helmet be sure to consider whether your choice is based on functionality and impact absorption properties. Ensure that your vision, particularly your peripheral vision is not impaired. Helmets that offer noise reduction may be useful for freefall though may hinder your performance under your canopy. We have to rely upon our vision, the feel and the noise produced by the speed of the canopy to gauge how it is performing. If you suddenly take one or more of these aspects away, then it becomes considerably more difficult to gauge how you are flying.

CRASHING. It is inevitable that one day you are going to crash. If it hasn't happened already, then you have probably been lucky. Eventually your luck will run out and you will be

forced to crash. *If you are going to crash then you may as well be good at it.* When was the last time that you practiced a Parachute Landing Roll (PLR)?

The simple answer to this dilemma is to practice while you are landing in good conditions and you should spend just as much time, if not more, practicing on the ground. You should have your legs together ready to PLR at least when you begin your final approach (approx 300 – 500 feet). If you are only beginning to think about preparing yourself for a crash at the last second then it may already be too late. **During the course, you will be spending some time practicing how to crash by performing a PLR on the ground and also at least once at the touchdown phase of one of your jumps.**

In any given landing scenario, sliding and not bouncing is the key to survival. Motorcycle riders will survive when they fall off at high speed provided they exit their bike cleanly and they don't hit anything along the way.

When was the last time you could run faster than the wind? Is it possible to run fast enough and then come to a complete stop without falling over and breaking yourself? The answers to the questions above is that it isn't likely, so having a good technique and sometimes a little luck on your side will go a long way to preventing a hospital visit.

KNOWING THE BEST PLACES TO CRASH.

Become familiar with your landing area. Before you jump at a new DZ, take a walk around and look for ruts, obstacles and most importantly, talk to the locals and get some inside info on the best outs, where to expect turbulence and during which type of conditions during the day.

HEADS UP.

Stay heads up, even after you have landed. Turn to face the oncoming traffic, once you have safely touched down and collapsed your canopy. Spend minimal time standing in the landing field, as you are only an obstacle and a target. Walk off as soon as safely possible. Complacency in the landing area may lead to injury if another person landing hits you or your canopy.

PREVENTION IS BETTER THAN CURE.
LESSON #2. BEING AN ACTIVE LEARNER.

Once a Student, Always a Student.

The day that you stop learning about any particular aspect of this sport should be the day that you give up jumping. ‘NO WAY!’ Might be your reply. I’ll never give up jumping because it’s too much FUN! If this is the case then you should always reflect on what you learned on each and every jump. Most of your learning will come from experience, either someone else’s (the easy way) or your own (generally the hard way). Experience is earned through time and not simply dictated by jump numbers.

It’s saddening to see that jumpers of all levels will spend time briefing and debriefing what they will do in freefall, yet very little is mentioned about their canopy handling and control? Should any less emphasis be placed on the most important stage of your descent? Why is it that we all want to hang out in freefall together at incredible speeds, yet we are scared of hanging out together under canopy at much slower speeds? In freefall, skill development arises by using a base as a relative marker. If you constantly spend time by yourself under canopy, how would you ever expect to make any significant progress?

Active learning involves planning for the entire skydive i.e. the briefing. Executing your plan as safely as possible and debriefing your canopy flight with your fellow jumpers.

The **CANOPY BRIEF** should include,

- ❖ The spot and your intended opening altitude
- ❖ Any in-flight skills/drills that each pilot will be attempting.
- ❖ Probable landing order amongst the group.
- ❖ Approach point to the landing pattern.
- ❖ Which circuit you will be intending to fly on landing.
- ❖ Probable landing direction.

Whilst debriefing, there are many questions you should ask of yourself and your group after you have landed.

- Did I know where I was in freefall, relative to the DZ?
- Did I allow enough altitude to get back to a safe landing area?
- Did I have a safe landing?
- Did I jeopardize anyone else's safety by making a good landing?
- How could I have made things better? How could I have made them worse?
- Will I be able to achieve the same landing in the same conditions on another day, or was it luck?
- Was I aware of my other landing options? Did I allow myself enough time to make the right decision?
- Is there one aspect of my canopy deployment and flight that should work on some more?
- Did I notice the difference between the amounts of input needed on this jump compared to another day when the wind strength may be much greater?

There are many other questions that you may choose to use to complement the briefing process. The emphasis of the briefing should be on having a plan, not only for you, but also for the whole group. The debrief should focus on how your plan was executed and the means to make the canopy flight phase of your skydives better. You can make this process as simple or as complex as you wish.

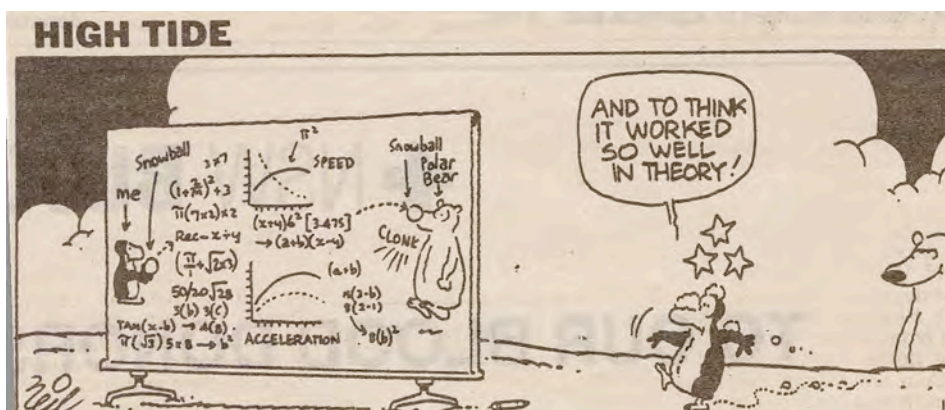
One of the key skills that you should learn from this course will be briefing and debriefing techniques. The sooner that you begin to apply these canopy flight skills to your skydives, the sooner you will begin to notice your flying technique improve.

VIDEO DEBRIEFING.

Many people pay good money to have a coach and freefall cameraperson for the day, yet they pay little or no attention to how they performed under canopy. Have you ever had an experienced person critique your approach and landing style? The culture of skydiving is gradually evolving to a point where regular video debriefing of the days landings is a more regular occurrence. A video image never lies and will teach you a lot about your landing technique.

Your approach and landings will be videoed during the day of your course. If an action needs immediate attention, your tutor will alert you to a better solution. At the group debrief at the conclusion of jumping, everyone will learn from both good and bad habits demonstrated throughout the day. Your tutor will be making constructive criticisms about approaches and landings. Your tutor may also ask for comments from individuals, so please do not feel ashamed or embarrassed by any particular landings. We have all made mistakes and we will probably make more unless we give ourselves the opportunity to learn from everyone else's.

LEARN BY THE MISTAKES OF OTHERS BECAUSE YOU WON'T LIVE LONG ENOUGH TO MAKE THEM ALL YOURSELF.



Active learning involves understanding the theory and the application of your knowledge. Remember that the application of knowledge takes a lot of time to perfect. So enjoy the learning experience, walk don't run.

LESSON #3.

“PRIOR PREPARATION PREVENTS PISS POOR PERFORMANCE.”

IN ORDER TO MAKE THIS A TRUE STATEMENT, YOU SHOULD ASSESS YOUR PRIORITIES, AND UNDERSTAND HOW TO PERFORM PREDICTABLY.

PRIORITIES EXERCISE.

List your top five priorities from exit to landing in order from 1 to 5 (1 being the highest and five being the lowest). You may choose to only pick five priorities or label different points with the same number.

- _____ Fly up to your mates under canopy and say G'day.
- _____ Fly and land predictably, so that others may easily follow you.
- _____ Land Safely.
- _____ Swoop the crowd and Look COOL!
- _____ Land before everyone else so you have the most amount of space available to land.
- _____ Land standing up.
- _____ Land so you don't get your rig and jumpsuit dirty
- _____ Land so you don't have to walk far to the hangar.
- _____ Turf surf longer than you ever have before.
- _____ Fly heads up, so that you can give every one some space.
- _____ Land on the DZ.
- _____ Check the spot before exit to determine whether you are likely to make it to the DZ.
- _____ Land on the target, no matter what, so you can brag at the bar.
- _____ Aim to improve your accuracy from your last jump(s).
- _____ Be aware of potential outs and be prepared to use them.

ARE THERE MORE PRIORITIES? WHAT ARE THEY?

PREDICTABILITY.

Communication with other jumpers.

All aircraft communicate their position and intention to land before arriving at an airfield to avoid congestion and the inevitable close calls and crashes.

Decisions should be made before embarking the aircraft as to what the exit order should be. You should aim to fly your canopy in the same manner that you aim to in freefall, by flying

your slot. The first group out should be the first to land, followed by the next group. Talk amongst yourselves on your jump as to what approach pattern you should use. Who will land first in your group, who will be last? This briefing phase of your plan is your first step to ensuring that your skydive will be both safe and successful.

SELF TALK. WHAT SHOULD I SAY TO MYSELF?

During the briefing phase of your jump it is *not such a bad idea to talk to yourself and remind yourself of a few simple things.*

- It is better to walk for 100 metres than to hobble or crawl for one metre.
- Hospital food sucks.
- Adrenalin deprivation will probably kill me or at least make me miserable for a few months.
- I could die doing this.
- Is there another way to achieve the same objective?

It is more beneficial to use brief positive thoughts that keep you in a good frame of mind rather than overloading your brain with a negative thought. The general idea behind talking to yourself is to allow the opportunity for thought before action. A few words to yourself throughout your descent may be all that is needed to prevent you from choosing an action that has disastrous consequences.

- Keep flying all the way to the ground.
- Always stay aware.
- Fly predictably.
- Heads up.
- Flare smoothly.
- Make up your own!

SIGNALS. HOW DO JUMPERS COMMUNICATE UNDER CANOPY?

The only means to communicate to everyone on the load when you are under canopy is to fly predictably. Flying unpredictably in traffic is hazardous to your own health and to others.

Leg signals are a useful method to communicate with your fellow jumpers whilst flying under canopy. By kicking either leg you can signal the pilot following you that you are about to turn. Normally three leg kicks are sufficient to allow other pilots to understand your intentions.

A 'wave off', scissor kicking action is useful to signal a break off and no further exercises. Either pilot should wave off until they see the other respond. This is normally done at around 2,000ft or at an earlier altitude, eg. You are a long way from the DZ and need to head back earlier or are running low on energy.



ACTION: Both legs scissor kicking.

Meaning: *Wave Off, Maneuvres Complete, time to break off and separate.*



ACTION: One leg kicking either left or right.

Meaning: *I am about to turn 90° to the left or right (depending upon which direction was indicated.)*

PERFORMANCE.

Sadly, performance is often believed to be inherent of the canopy itself. Around the DZ it is common to hear jumpers using the following reasons for buying a smaller, faster canopy.

- *'I want to buy a high performance canopy because my old canopy gives me shitty landings and it can't get me back from a long spot.'*
- *'A new parachute will allow me to go faster so that I can get more lift in my flare so I'll get better landings.'*
- *'Better landings are more guaranteed with a smaller canopy.'*

The following may not often be heard but I imagine that these reasons are often thought of by people about to buy a newer smaller, faster parachute.

- *I want to be like my mates and have the smallest fastest canopy around.*
- *I don't need experience to fly a different canopy, I'll get used to it, I'll learn along the way.*
- *I'm really getting bored with my current canopy. I don't know what all the fuss is about, my new canopy will only be 30 square feet smaller than the one that I already jump.*
- *Elliptical is the way to go; everybody is jumping them these days.*
- *I've got 250 jumps, which is HEAPS of experience; I'll be able to handle a faster canopy.*

One must remember that, once you deploy you are now flying an aircraft with no instruments. Some other aircraft pilots may dread the thought of flying without the aid of mechanical, electrical or pressure sensitive instruments. So why do some skydivers believe that they are capable of flying a faster wing when they generally spend very little time under a canopy?

Consider an example of a jumper with 300 jumps. Let's say an average of three minutes is spent under canopy on each sortie $3 \times 300 = 900$ minutes or 15 hours. In the disciplines of paragliding and hang gliding you are still rated as a novice until 20 hours and an advanced pilot once you have attained 120 hours. If you are learning to fly fixed wing aircraft, you certainly have not even graduated from student status until approx. 25 hours. You would only be considered experienced once you have attained perhaps hundreds of hours and in many

different conditions. What makes jumpers think that we are better than other humans that fly? Jumping can be one of the most difficult forms of flying because of the lack of instruments and we only get one chance at landing. Most pilots dread the thought of having an engine failure and being made to do a forced landing.

Parachute performance is not measured in size, shape, or speed. Performance is measured by the execution of skills at the most appropriate time by the person that causes the parachute to fly in the first place. A parachute with no suspended weight merely floats in the wind. A high performance canopy will only fly at its optimum when it is flown decisively and with precision. The skills required to fly such machines, may be honed on a high performance wing but should be learned on a lower performance canopy.

Time, speed, perception, responsiveness and the FUD factor (Fear, Uncertainty and Doubt) are all critical factors of any descent that will change when you fly a different canopy. Whether you are capable to deal with the change in these factors may make the difference between just getting away with it and ruining your life for the next few months, years or forever.

It is in your best interest to respect the opinions of your instructors and obtain their recommendations before buying or jumping a new canopy. It is a recognition by your peers that suggests that you have the ability, knowledge and skills necessary to fly a more highly loaded canopy.

WHAT HAPPENS WHEN YOUR CANOPY GOES OUT OF TRIM AND HOW DOES IT AFFECT THE PERFORMANCE?

Every time your slider skids down your lines, friction between the grommets and lines causes the lines to heat and therefore shrink. A popular misconception is that they stretch over time as more shock/stretch forces are applied to them during the opening sequence. Whenever a new line set is attached to a canopy it does take a few jumps for the lines to settle in or seed themselves. A good way to see this is to check the attachment points between the canopy and the end loop of line. Check it on a brand new canopy or when a new line set is applied and you will notice that after a few jumps it will begin to settle into place.

Generally speaking the outer lines will shrink more, including the brake lines. As a result, when you turn your canopy, it will tend to recover a lot faster and either plane out or gain lift depending upon how much speed you have as a result of your turn. Manufacturers recommend that lines be replaced after every 500 jumps or so. Ask your rigger to check the trim of your canopy for you. This can be done on the ground by comparing line lengths with an identical canopy that has a newer line set, or by measuring the lengths and checking with the manufacturers specifications. An experienced canopy pilot should also be able to determine whether it is well out of trim or not as your parachute is flying.

Canopies that are significantly out of trim will be noticeable whilst opening. Erratic openings and stalling after inflation is evidence enough that the trim of your canopy should be checked. If one line breaks it may be possible to just replace the line. However it may be a much better idea to replace the whole set. A canopy with a new line set will bring new life to an old rag (provided it isn't too old!).

Canopies become more difficult and sensitive to fly when they are out of trim. At the severely out of trim end of the spectrum the pilot may be limited to three quarters or two thirds flare range and the canopy will therefore be significantly more difficult to fly. The canopy when viewed as the parachute is flying toward the viewer will have a considerably rounder shape.

If you have never had a new line set and have done many hundred of jumps on your canopy, then it strongly recommended that you replace them for new ones. It may set you back a few hundred dollars for the lines and installation, but it may also save you a cutaway, repack, carton of beer, or a lost free bag and/or canopy.

FLYING YOUR RESERVE.

As little as a dozen years ago, virtually all canopies were made from F111 material. Canopies were predominantly 7 celled. Today canopies are not only a different shape but also size, line and material type. Those of us who are relative newcomers to the sport may not have ever experienced '*lower performance*' canopies.

Consider the following questions.

- Do you know what your reserve looks like?
- Have you ever flown a seven cell F111 canopy that is a smaller than your main?

- Do you have the required skills to land your reserve in a tight spot after cutting away and being under your reserve at low altitude?
- Do you want your first experience to be your first reserve flight?

A SMART PILOT WOULD...

- Inflate their reserve canopy on the ground when it is due for a repack and ground-handle the canopy to observe the differences between their own main and their reserve.
- Make every effort to find and jump a seven cell F111 canopy several times to learn the differences in handling characteristics between it and a modern 9 cell zero porosity canopy. Be wary not to choose an old rag that has had a significant amount of jumps on it, as the canopy will behave considerably differently to a reserve that may not have even been jumped.
- Practice their accuracy skills on every jump including braked approaches. It is not necessary to continue the braked approach through to the flare. You should allow the canopy to recover to trim speed before flaring and touchdown. The necessary flying and judgement skills required to land a seven celled F111 canopy in deep brakes requires a lot of practice in the right conditions. It may also be a lot harder than it looks.

THE IMPORTANCE OF POSTURE.

Do you have a comfortable harness? Does it fit properly? Does your chest strap restrict your arm movement? Do your leg straps allow you to sit in the saddle, rather than just hang there? Do you feel like you and your canopy are integral pieces working together or is that just a piece of fabric that you deploy to save you from imminent trauma?

A comfortably fitting harness is essential for a safe deployment of a canopy. Could you imagine how uncomfortable you would feel and how insecure you would be if your harness were too large for your body? There are video images of people nearly falling out of their rigs due to wearing a harness that was too large for them. In one instance, a skydiver nearly fell out through the bottom of the rig as he was attempting to sit fly for the first time. The BOC was virtually up around his shoulder blades and the leg straps were around his knees. If his lower legs had risen any higher he would have definitely fallen out. As he was so intent on trying to sit fly well, the awareness of what his rig was doing didn't appear to be a concern.

Luckily and thankfully he had a normal deployment, albeit a little unstable on his side (pilot chute side upright). Lack of currency and experience didn't help in this situation either. Forethought could have prevented it from happening in the first place.

Other incident reports tell stories of people falling out of their harnesses during track off. This was due to not threading the chest strap correctly through the locking gate on the harness. A simple mistake that lead to a terminal outcome.

On the other hand a harness that is too small for you is just as likely to affect your posture in freefall. The harness may restrict your movement and desired body position in freefall, regardless of which body position you enjoy flying in. More critically the extra size of the person may sometimes be significant enough to put tension on the bendex tubing and reserve ripcord cable. So much so that it might just be enough to pop the pin. A premature deployment is no fun at all, whether it occurs inside or outside the aircraft.

When you deploy, if you end up sitting low in the harness with the chest strap up around your throat then you should talk too a rigger about the possibility of shortening the harness or invest in a better fitting harness. Perhaps your leg straps were not tight enough or are too long as well. It not only makes reaching the toggles, slider, and top end of the risers harder, but also it wouldn't do much for the comfort factor either. Your posture in your harness can significantly influence how well you can fly.

If you have never tried the following before, then perhaps you should when the opportunity arises. Once again the important factor is to notice the difference that it makes to the flight of you and your canopy. The difference becomes more noticeable when your wing loading increases. i.e. A light person on a larger canopy may not notice the differences, but will appreciate them more when they jump a smaller canopy or increase their exit weight.

Remember that your priority when you open is not to deal with collapsing your slider or lengthening your chest strap, rather it is to fly away from the line of flight and other canopies until your have sufficient clear airspace. If you are lower than you anticipated, then concentrate on flying and executing your plan, rather than adjusting your harness.

COLLAPSE THE SLIDER. This will reduce drag and increase your speed. The smaller the canopy the more significant the reduction will be. The canopy itself whilst providing lift also may cause up to 80% of the total drag. Your body size, clothing, slider and lines provide the remainder.

There are several different types of collapsing mechanisms, from double drawstrings to V style double drawstrings. Some pilots prefer to wrap the slider around itself and stow it on a keeper that is attached to the reserve flaps. You should seek advice on the best method to use. If you fly a faster canopy, by not collapsing the slider you are allowing the slider to ‘flap’. Such action will wear the lines faster at the attachment points. Protectors on your rapide links will reduce this problem, though you are better off to collapse it, time and airspace permitting.

PULL THE SLIDER DOWN THE RISERS. This is best done when the brakes are still stowed. It is much easier with a dual drawstring on the slider. Once you have located the tabs, your vision can then return to scope mode and in one action you can collapse the slider and pull it down the risers over the toggles and behind your head. Velcro and single drawstrings tend to be a little more cumbersome and inflation of the slider may occur after you have pulled it down.

The action of pulling past the rapide links is easier when you have mini links or better still soft links. If you have larger links or wider (one inch) risers, it may be difficult to pull the slider over the risers, so you will probably be wasting your time.

If the slider is un-stowed and is left resting on the lines, it makes the lines and canopy flutter and shake. Such motion is detrimental in two ways. The shaking motion increases the rate of wear on the line, particularly where the line joins the link. Secondly, the shaking motion shakes the risers, lines and canopy in such a way that it is detrimental to its flight. Imagine if you were flying a fixed wing aircraft with loose control surfaces that shake loosely while in flight?

LENGTHEN YOUR CHEST STRAP. Lengthen it to its fullest extent. If your harness is normally tight around your shoulders and chest, then this will relieve a lot of the tension.

More significantly however, in combination with collapsing and lowering your slider it will allow the lift webs of your harness to spread out (more on this shortly)

SIT IN THE SADDLE. Rather than just hang in the harness, try lifting your legs and sliding the leg straps along your thighs a little. This will allow you to sit and you will probably find that it is a lot more comfortable, especially if you intend to open high and spend considerable time in the saddle. It will also help with your landings as it keeps your centre of gravity behind your legs and feet. This should help maintain your balance, so even if you land a little faster than expected, once your feet touch the ground it will pull your body upright. If your body is already upright then the canopies speed will pull you forwards and possibly tip your balance so that you fall flat on your face. It is also much easier to lift your legs and slide on your backside if need be from a seated position. Though only use this as a last resort, because one of the most important body parts you should protect is the base of your spine and your spinal cord.

Think about four attachment points on your harness and canopy. One occurs at the canopy and lines, another occurs at the rapide or soft links, an obvious one at the three-ring system and at the point at which your leg strap meets the lift webs. Once you do the tasks mentioned above you could almost draw a straight line between yours hips and the outer lines on each wing of the canopy. You have now become one with the canopy. You are an integral part of the parachute/harness system, without you it will not function. Now you should feel like you have greater flexibility in your body movement, remembering that weight shift in your harness is a significant control factor. Your canopy is allowed to flatten its aspect, as a result of the change in geometry.



A.



B.

Photo a. Demonstrates the shape of the wing and the geometry of the lift webs and risers when the chest strap is lengthened (removed in this case) and the slider is collapsed and lowered over the toggles to the bottom of the risers.

Photo b. Close up view of a collapsed slider that has been lowered below the soft links. This will prevent wear on the lines at the links. It also minimises the amount of slider shake. When the slider shakes, it transfers the shaking energy through the lines to the canopy.

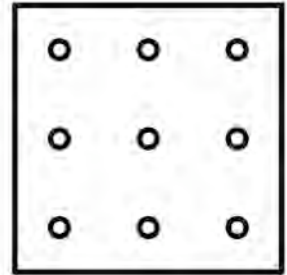
Before attempting any of the mentioned tasks ensure that you have sufficient altitude and airspace in front of you. It is essential to remind yourself that collapsing and lowering the slider and lengthening your chest strap are not crucial to your survival. So don't forget about surviving purely for the sake of trying to improve the efficiency of your wing. Remember your priorities! Avoiding a collision is paramount. Canopy collisions and canopy wraps are avoidable, and there is an important distinction between the two.

A SIMPLE OBJECTIVE!

Your objective is to draw four straight lines that pass through all of the nine dots. Imagine you're in a situation where your life depends upon your choice of actions.

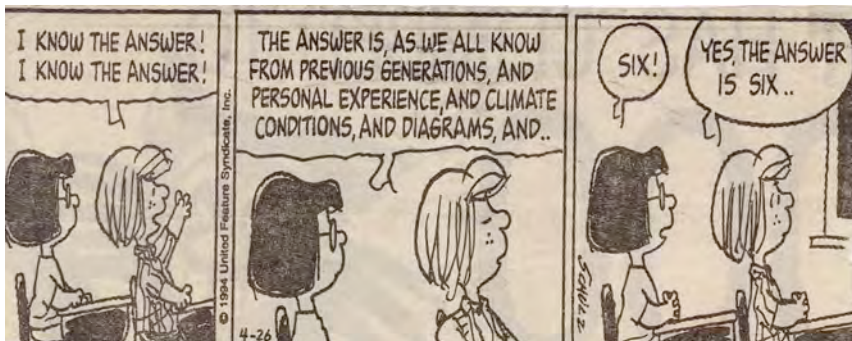
To complete this puzzle you must use these rules.

1. Use only four straight lines.
2. The lines must pass through all of the nine dots.
3. You are not allowed to backtrack or lift your pen from the page.
4. You have 30 seconds to complete the puzzle.



What did you learn from this activity?

How did you fare? Did you live or die? Did you use your existing knowledge to challenge what you know should be a simple task? Did you have a successful solution in under 30 seconds? 1-½ minutes? How often do we find ourselves in situations where we should have made a decision much earlier or with better judgement? My guess would be at least once a weekend, while you are jumping. Most of the time, in freefall and under canopy, the consequences of our actions are such that we can get away with our actions and learn from the experience. When we land this theory doesn't necessarily apply.



PEANUTS.
BY CHARLES
SCHULZ

THE ANSWER IS OFTEN VERY SIMPLE; SO DON'T TRY TO COMPLICATE THE ANSWER. YOUR TUTOR WILL HELP YOU WITH THE ANSWER AFTER YOU HAVE MADE AN ATTEMPT.

LESSON #4 SAFETY.

Safety is paramount at every stage of your skydive. If you are going to engage in Canopy Relative Work (CReW) then there are a number of issues regarding gear that must be considered.

SINGLE OPERATION SYSTEMS (SOS) are not recommended because in the case of a wrap you need to be able to freefall away from the entanglement and deploy at a safe distance.

RESERVE STATIC LINES (RSL's) should be disconnecting after deployment, to ensure that you may freefall after cutting away. *How you ever practiced this procedure?*

FRONT RISER HANDLES should be sufficiently large enough to allow for quick and easy access. If they are too small you may need to waste valuable time trying to get your hand or fingers through them. You should try packing them so they are pushed flat against the top of the riser so they develop a memory and open up during flight. Some pilots prefer to just use front riser blocks, which may be quicker to use though allow for your hand to slip down the riser. Look around your DZ at other types and question pilot's choice of handle type.

COLLAPSING SLIDERS AND CHEST STRAPS. If you do both of these actions you should pay particular attention to where your handles now sit relative to your body. The lift webs may not sit against your body and may be in a wider configuration. When you chop like this your harness will feel a lot looser on your body.

HAVE YOU DONE YOUR GEAR MAINTENANCE? Your monthly three-ring maintenance should be completed regularly EVERY month, perhaps even sooner if you are jumping a lot. Having a hard pull on your cut-away handle is not much fun and is potentially fatal.

HOOK KNIVES. Do you have one? The first time that you need one shouldn't be the first time that you wished you did. Your hook knife should...

- Be easily accessible though secured to your rig or jumpsuit.
- Have an easy grip handle that doesn't require you to put your fingers through small holes.
- Be sharp.

SITUATIONS WHERE YOU MIGHT NEED YOUR HOOK KNIFE INCLUDE,

- When part of your clothing or equipment is caught on the aircraft.
- When one control line is un-releasable. You might choose to use your knife to cut it before cutting away. Time and altitude permitting.
- When you have a line or lines caught on a camera helmet.
- When you are entangled with another canopy.

CANOPY COLLISION VERSUS A CANOPY WRAP.

A collision occurs when two or more people are unaware of the others intentions, direction of flight, proximity during opening or simply didn't see that someone was about to hit them. A collision may result in a wrap or entanglement. A canopy wrap may occur when people are actively participating in Canopy Relative Work (CRW). An entanglement may occur because they are trying to achieve a formation incompatibly. Some people may use this as a reason to not participate in CRW. Unfortunately too many people focus on the negative consequences rather than the positive ones. What most skydivers fail to see is the advantages of CRW and what it can teach you about canopy flight and how it can improve your technique and skills. What they also fail to see is that we are all doing CRW on every jump in a no contact configuration and sometimes in a very random chaotic manner.

A wrap, for example may be caused by having too much speed on approach, too much lift or sink relative to the other canopy whilst in formation or having too much tension between grips in a formation. Are these the same things that cause funnels to happen in freefall? When you are learning about Canopy Relative Work (CRW) either in contact or no contact flying you should adopt a '*take one step at a time*' policy. Take SMALL steps rather than big ones. Learn from someone you feel comfortable with and always assess the three C's before embarking the aircraft. **Communication, Compatibility and Consequences.**

What should I do if?

I am entangled with another canopy.

- **COMMUNICATE ALTITUDE.** Yell out to the other person. Use simple specific words. '2,500 FEET'. If insufficient altitude for a safe cutaway and deployment is available then brace for impact. If you have no other options left as the two entangled

canopies may not be adequately supporting the weight of both jumpers then deploying your reserve to get more fabric above both of your heads to slow your descent may be your only option. This should only be used as an absolute last resort.

- **LOWER PERSON CUTS AWAY FIRST.** Freefall clear of the entanglement. Do a long delay if possible. Normally the lower person should have clear airspace below them. If the top person cuts-away first then the possibility exists for a body collision as he/she falls past.
- **THE REMAINING PERSON MAY STILL HAVE A CANOPY THAT IS LAND ABLE,** though may have their body or lines entangled with the jettisoned main. If time and altitude permits then this person should free themselves from the canopy, using a hook knife if necessary, and then decide whether to land their main or opt to use their reserve.

**YOU SHOULD REHEARSE YOUR CUTAWAY AND RESERVE PROCEDURES
IN ORDER TO INCREASE YOUR ABILITY
TO DEAL WITH ADVERSE SITUATIONS.**

PRACTICE CUTTING AWAY FROM A DISORIENTATING SITUATION.

Try taking one toggle off at altitude and leave the other one set. Your canopy will begin to spiral and you will be losing altitude quickly. Complete a cutaway drill by locating your handles and perform practice pulls on both handles. Then straighten the canopy up by using the rear risers and weight shift. Remove the other toggle and continue to fly normally.

PRACTICE GETTING YOUR KNIFE OUT ITS POUCH.

Should the first time that you get your knife into your hands be the first time that you need to use it? Practice straightening up your canopy after opening using weight shift and rear risers and reach for and remove your knife from its pouch.

LESSON #5 SPOT 'N HOP 'N POP

WHEN WAS THE LAST TIME THAT YOU DID A HOP 'N POP? IS A HOP 'N POP A WASTE OF GOOD FREEFALL OR A SMARTER WAY TO BECOME A MORE COMPETENT SKYDIVER?

In today's era of GPS spotting we tend to rely a lot upon the pilot to determine the spot and to fly us safely to it. Even if you are unaware of how the GPS works and how to read the information that it is giving you, there are a number of important points, that you should be aware of....

Whose job is it to communicate with the pilot?

Normally one jumper, i.e. the spotter should be communicating with the pilot to maximise the pilots ability to concentrate on flying the aircraft.

What is necessary of the aircraft before exiting?

1. The pilot has airways clearance.
2. The pilot has reduced both power and speed of the aircraft.
3. The pilot has levelled the aircraft. This can be double checked by looking at the angle of the wing relative to the horizon.
4. Every jumper has been gear checked.
5. The door has been opened and correctly secured.

HEADING.

Being able to exit cleanly and stably from the aircraft is a necessary skill to have. When you are hopping and popping amongst other people it is important that you fly your canopy so that you keep it on heading and everyone remains facing the same direction. In order to achieve this you should be flying as you leave the door, facing into the relative wind and uphill is easiest. If you dive out, you must be able to turn back onto heading before deployment.

Learn to know how your canopy behaves in sub-terminal air. Learn to fly it through the opening using weight shift in your harness and rear risers. Your canopy is more susceptible to input because it is generally taking longer to open because of the sub-terminal air. Be very wary if your canopy does open off heading and you do end up flying towards the person that exited before you.

HOW LONG SHOULD WE LEAVE BETWEEN EACH EXIT?

This depends upon a number of variables.

The ground speed of the aircraft. This can be determined by using the GPS or by looking at the ground and judging it visually.

How close you would like to be to the previous jumper. Competitive CReW jumpers may leave the aircraft as a pair and deploy within a second of one another. Leaving the remaining jumpers exiting in short intervals after one another. Throughout this course, leaving 10-15 seconds in between each pair, and 3-5 seconds between individuals of the pair should suffice.

If you are in doubt about how much time is necessary, then leave more time and distance. You might also choose to separate further by doing different length delays. Obviously differences in opening times may put you back on the same level as the previous jumper. So always be vigilant, stay heads up, look around, and continue to fly your canopy on heading until you are sufficiently separated.

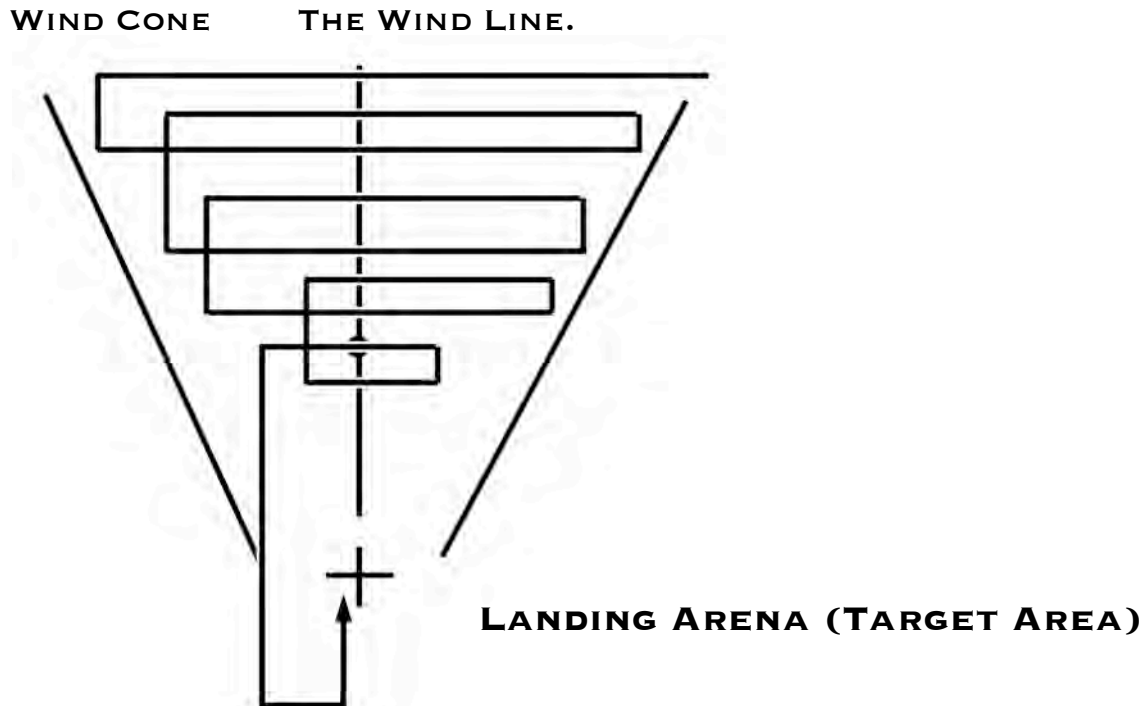
TURNING TO A HEADING.

As skydivers it is common practice to oversteer, particularly whilst landing. You may have noticed jumpers continually making small corrections on final approach. Such oversteering does little to help improve your landing. In fact it will hinder your airspeed as energy is being used to turn your parachute. Your descent rate will increase, and your flare response will be less because you have slowed your airspeed.

To maximise your learning, you should practice your turns to a particular heading using either another canopy as a base or a ground reference such as the runway, a fence line or road as a heading. 90 degree turns are a good starting point as this will help you to practice the turns necessary to fly a better landing circuit. You should repeat the same type of turn in a circuit pattern and continue to fly circuits as altitude and airspace permits eg. Practice rear riser turns.

Remember that it is not necessary to hold an input (harness, toggle or riser) for the entire turn. Depending upon which input you choose to use, you might only need to hold the input for half to two thirds the way through the arc of the turn. You should practice allowing the

canopy to complete the turn without any major or minor corrections. Slow the turn using minor harness corrections if necessary, rather than with toggles or risers. While turning you should endeavour to learn the feel and timing of the increase and decrease of speed both in a forward and vertical direction.



A TYPICAL FLIGHT PATH.

THE WIND LINE is an imaginary line drawn between the target arena toward the wind.

THE WIND CONE describes a sector of the sky, roughly 45° either side of the wind line. Before reaching this imaginary boundary, the pilot should be ready to perform a turn to either hold into the wind or run back closer to the target arena. If you spend too much time flying outside the boundary of the wind cone, the pilot may experience difficulties reaching the target arena.

In this particular example most of the flight was spent on a crosswind leg with short intervals on both upwind and downwind legs. It will be necessary during your flight to adjust the time spent flying on each particular leg in order to make a safe arrival in the landing arena.

LESSON #6.

APPROACHING THE LANDING PATTERN.

From the Performance Designs Website. www.performancedesigns.com

FLYING DEFENSIVELY

Help create a safer situation for everyone, by landing in a different place than everyone else; and/or a different time to everyone else.

Every pilot's goal should be to prevent a high density of landings occurring in a short period of time in a small landing area. Some of the worst accidents can be collisions that occur on final approach, often because everyone is landing in far too many directions to be considered safe. Less traffic density means that there will be less chance of an accident.

DIFFUSE THE HOT LANDING AREA BY TAKING THE INITIATIVE TO LAND ELSEWHERE.

It is better to walk 100m than to crawl for two. By making an early decision to opt for another landing area when the traffic pattern seems congested is a cool thing to do. It will not only make it much safer for you, it will be less crowded for everyone.

TIME YOUR ARRIVAL. Stage your approach to the landing area by hanging out at the holding point or by taking the initiative to land first.

By 2,000ft you should have assessed the traffic pattern. Ask yourself two simple questions. Are you nearest the top of the stack or the bottom? Is your canopy loaded more heavily or lighter than other pilots in the stack? Then consider these options.

IF YOU ARE TOWARDS THE BOTTOM AND HAVE AN AVERAGE LOADING, then you should aim to land as soon as safely possible. Effectively, you are trying to stretch the time period during which all of the landings will occur by getting the landing process started sooner. If you don't do this then you may start crowding the traffic behind you.

IF YOU ARE TOWARDS THE BOTTOM AND HAVE A LARGER FLOATIER CANOPY, the faster traffic will probably catch up and pass you. Where would you prefer

this to happen? If you dive down and try to set up on finals early, then the traffic pattern may become congested at the worst point of the pattern. In this case, assuming the spot is good, it may be a smarter move to float in brakes from the start. This will force the traffic to pass you while you are still quite high. Being passed higher up is much better than being passed on finals.

IF YOU ARE CLOSER TO THE TOP. You should aim to float in brakes. You are trying to stretch out the time period that all the landings will occur in, by landing later. This is easier if you are on a larger canopy and choose this option earlier in your descent.

IF YOU HAVE A HIGHER WING LOADING, YOU SHOULD STILL BE ABLE TO FLOAT IN BRAKES. If you can't then you should opt to land at a different area if the pattern is congested. A skilful pilot should be able to float just as much as someone on a larger canopy, so keep practicing!

If a safe gap appears then you might choose to pass others early before entering the landing approach. Remember to pass in clear view of the person in front, DO NOT approach from their blind side and become a surprise.

Generally speaking the first group out, should be the first group to land, so try to fly your slot and land when it is your turn. Anticipating the actions and learning the habits of others, both good and bad, will help to keep you out of trouble. Here are a few examples.

SLOWER TRAFFIC BELOW: *The indecisive slowpoke.* You may find that someone with a larger canopy likes to do sashays on their final approach into the landing field. If you are flying a much faster canopy, try to avoid following them on their downwind leg. You might get stuck behind them, necessitating a passing move on late final. The problem lies in that you may not be able to predict where he will be when you need to pass. A better solution would be to pass him earlier on before you begin your approach, or begin your base leg earlier, opting to landing further up wind than them.

FASTER TRAFFIC ABOVE: Some pilots like to set up in deep brakes very high over the approach area, then dive steeply down using a front riser turn and swoop the landing field. Unfortunately, some of these people do it every time, regardless of traffic and may not have

accounted for your presence. This problem may be considerably compounded if pilots with lighter wing loadings have arrived first. Even though technically, you may have the right of way over the higher traffic, it may be a smart idea to land elsewhere if you anticipate a conflict. Conversely the faster traffic should consider the same option.

THE LAST SECOND HOOKER. These pilots love to do low toggle turns, much lower than you are willing to risk. If you are following such as person back from a long spot, don't wait for them to turn into wind. Remove yourself from the situation early while there is still plenty of altitude.

A GOOD LANDING ALWAYS BEGINS WITH A GOOD APPROACH. Your inevitable arrival may be made easier by the fact that to a certain extent you can control the time that you spend in the air. So by practicing techniques (i.e. Hanging' out, brake turns, rear risering) that you will have the opportunity to practice during this course you should have more time to assess how you will fit best into the landing pattern.

Before you leave the planet you should make a plan based on the current conditions and spot. You should also have an alternate plan should you need to land off. Be very aware that throughout your descent you must continually assess whether your plan will be successful.

2000FT, DECISION TIME. You should be upwind by now and close to the wind line. Know which landing area you are going to be able to land at safely. Assess your speed, sink and your likely effect on the pattern as early as possible as it will create an environment that is safer for everyone. Avoid getting to the approach point and then trying to figure it out. The earlier you make this decision the better.

1500FT HOLDING POINT. If you get to around this area and the pattern is looking worse, you should either land further upwind, use an alternate or 'hold into the wind' to hopefully increase the separation between landings.

1000FT APPROACH POINT. If your spot is good then you should plan to fly to the approach point first, then to the landing area. This will ensure that you can fly the pattern with everyone else rather than joining on the base leg or final glide. The approach point should be upwind and off the wind line.

WHICH WAY IS EVERYONE GOING TO LAND?

Does your DZ have a circuit pattern rule? Land to the north in light winds, right hand circuit in a southerly etc. Does the pattern allow you to approach over the least amount of obstacles? Did you talk to the others on your load before you went up as to which way it would be best for everyone to approach from? It doesn't take much time nor much energy to work things out before you embark. If someone is following you, you can advise him or her about which way you intend to go by kicking the appropriate leg. Make sure you both know these signals before you leave the ground.

LANDING IN TRAFFIC.

Imagine a line that divides one side of the landing area from the other. The line may pivot through the centre of the landing area depending upon the wind direction. Imagine this line as a double line on a road.... Don't cross to the other side, because it is unsafe to do so, especially if pilots have been foolish enough to approach from different directions. If you imagine the landing area with multiple parallel landing strips rather than a central target, then collisions and 'near misses' can be avoided. You may need to shorten or extend your base leg in order to land on the closer or further runway.

WHICH WAY DO I LAND IN LIGHT WINDS?

It is not necessary to land into the wind every time you land your wing. Though it is important that you follow the leader, to avoid collisions on approach and landing. Think parallel runway rather than central target. Sometimes jumpers tend to swarm like flies to a piece of s*^t, buzzing from every direction. If the leader has chosen to foil everyone else's plans and land in a different direction than planned, then your load as a team needs to debrief and examine jumpers habits and intentions and ensure that everyone's safety is not compromised again.

LESSON #7. SELECTING A RUNWAY.

IMAGINE AN AIRPORT WHERE NO ONE KNEW WHEN ANYONE ELSE IS ARRIVING?

OR WHICH RUNWAY WAS ACTIVE?

HOW MANY ACCIDENTS OR NEAR MISSES WOULD YOU HAVE IF THIS WERE THE CASE?

All parachutes require different length runways to land successfully. Older style seven cells and larger slower canopies tend to need less runway but more vertical airspace over the landing area. Smaller faster canopies require longer runways but still require a lot of airspace for approach.

Different canopies and different pilots require different amounts of time to complete their landing pattern. Some like to fly faster, others much slower. It is the difference between the two that every pilot must learn to deal with. Generally speaking, you are not the only person in the sky. Consideration must be given to everyone on the load regardless of experience.

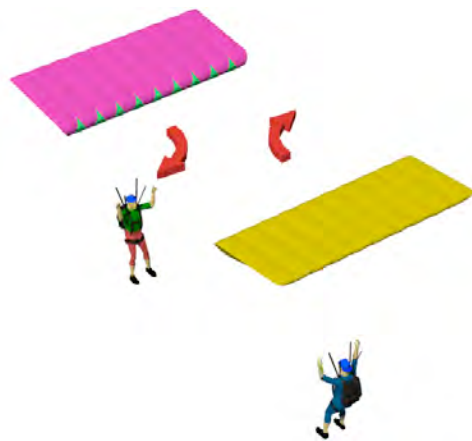
It is important on every jump to fly your slot and give each other time to complete a landing approach without jeopardising others safety. The first group out of any aircraft should be the first to land; it's only common sense. Later groups should either be opening slightly higher or should stay in brakes until a sufficient distance and time is allowed for greater separation. Avoiding congestion in the landing field is the best way to minimise close calls.

- Are you able to adjust your speed to wait for someone else to land?
- Are you able to adjust your landing pattern to cater for extra traffic?
- Are you able to land crosswind because you are unable to complete your last turn in time?
- Have you picked an alternative runway to land on to avoid the congestion?
- Does your runway have sufficient length to allow for overshooting and undershooting your target?
- Are you practicing your accuracy skills on EVERY jump? One day they are really going to come in handy.

THE GIVE WAY RULES.

- **HIGHER GIVES WAY TO LOWER.**
- **FASTER GIVES WAY TO SLOWER.** Sport canopies should give way to students, tandems and camera-flyers, who may have a restricted field of vision.
- **RIGHT IS RIGHT.**

In a **COLLISSION AVOIDANCE** situation, turn right. After opening you should use a handful of rear riser to turn. It will take you too long to reach for and remove your toggles to turn.



- **Converging** (at a similar height). Canopy to the right has the right of way.

The canopy of the **left should turn left** and the **right side canopy should turn right.**



- **Overtaking.**
The canopy being overtaken has the right of way. The overtaking canopy shall pass to the right.

IT MUST BE REMEMBERED THAT...

NO SINGLE PILOT HAS THE ABSOLUTE RIGHT OF WAY.

**WE SHOULD ALL FLY RESPONSIBLY AND
CONSIDER THE AIRSPACE AS EVERYONE'S.**

LESSON #8 FLARING AND TOUCHDOWN.

The most important stage of your jump is your landing. You can do everything correctly right up to this stage, and completely jeopardise your health by blowing the landing. Here are a few hints to make your arrival more successful.

MAKE ALL MOVEMENTS SMOOTH. Your parachute will respond to the manner of your input slow, fast abrupt or gradual. Either way keep flying smoothly.

LOOK IN THE DIRECTION THAT YOU WANT TO FLY. As simple as it sounds, the moment you start to look anywhere other than where you intend to fly then your body will follow suit and begin to fly in that direction.

BE PREPARED TO DO A PLR by putting your legs close together when you are on long finals i.e. at around 300-400ft.

THE THREE STAGES OF A FLARE.

Essentially there are three things that you need to achieve in order to land safely and successfully. The first is to slow your descent rate to a survivable rate. The second is to slow your forward speed to a point where you have little or no forward speed left. Lastly and probably more importantly, touchdown onto the ground in a balanced manner that allows a safe transition of your weight being carried by your canopy to being able to support your own weight.

THE PLANE OUT.

When you begin to flare, you will reach a point where the canopy begins to fly level or plane out. It feels like you are not descending any more. It is at this point where you should hold the flare, until you feel yourself begin to descend once more. Depending upon your speed and canopy type, this may take as little as a fraction of a second to a number of seconds.

ROUNDING OUT

The round out stage of your flare is when you can either flare energetically and pop or float the canopy, which is useful when you are landing in unfamiliar terrain. Or keep the canopy flying in a straight line till it gets closer to the point at which it runs out of momentum. Just

before your canopy runs out of momentum is about the time when the ground should meet your feet.

TOUCHING DOWN.

Whilst flying a canopy, you should always try to keep flying for as long as you can before putting your feet on the ground. The moment that you do should be at a point where you have washed off enough speed during the round out to safely touch down so that you don't have to run excessively. If you have excessive speed, your legs will normally end up behind you causing your balance to tip forwards, resulting in an awkward landing. So always try to land with your feet slightly in front of your body and your legs slightly bent. You should always be ready to PLR regardless of your experience. The more you fly the less you will need to rely upon your legs to bear the brunt of the touchdown. If you imagine trying to land a foot above the ground then you should be able to achieve a better landing for a number of reasons. Firstly, you'll have finished flaring before you touch down. Secondly if you did misjudge your round-out height then you'll still have a foot of altitude up your sleeve.

TYPES OF LANDINGS.

FLOAT LANDINGS. Are best to try in moderate wind conditions and are useful for off field landings where you are uncertain of the hazards on the ground, eg rocks and ruts. As you are approaching your touchdown point, begin to float your canopy by applying a little more brake. When your airspeed matches the wind speed, you will seem to float in the one spot. If you apply too much brake then you will generate a lot of lift. When the lift runs out there is only one place to go, so be careful, not to apply too much. As you float to the ground, finish off the flare.

CROSSWIND LANDINGS.

When landing crosswind, it is important to keep looking towards your intended path or even a little further towards an upwind direction. Favour your upwind toggle just slightly more than your downwind toggle, not so much to turn your parachute but to keep your canopy pointed more into the wind. Generally speaking, your body and its functions will tend to follow your head, so be mindful to stay focused and not look straight down at the ground or towards downwind. Keep flying and remember that your body position can significantly influence how good or how bad your landing may become.

LESSON #9 HABITS.

GOOD HABITS START EARLY.

Once you begin to develop good habits, you will find that it will almost become second nature for you to perform wind checks, maintain heading awareness, and remain height aware and fly predictably among the traffic pattern.

- Talk to the group that you are jumping with as well as the rest of the load before embarking the aircraft, regarding your opening altitude, circuit pattern and landing direction.
- Deciding a landing order among your group
- Check the spot, before you exit.
- Aim to improve your tracking on every jump.
- Flying Smoothly.

Bad habits will get worse if not addressed. Such habits include....

- Not having a plan
- Flying unpredictably
- Not observing the traffic pattern
- Target fixation
- Always using the same technique to land i.e. Not having a repertoire of landing skills
- Sashaying on finals in traffic
- Leaving the decision making process too late.
- Not practicing in flight skills on every jump.
- Opening low every time so that you do not give yourself enough time to exercise and practice old and new skills.

Some bad habits on landing include...

- Reaching for the ground with one leg, rather than waiting for the ground to meet your feet
- Lifting one toggle at touchdown.
- Extending a hand out to protect yourself.

- Stabbing the ground with your feet.
- Not flying all the way to the ground

Briefing and debriefing the canopy flight will help to eliminate these problems before they arise.



BY NOT ADOPTING A PROPER PLR POSITION, YOU CAN EASILY INJURE YOUR LIMBS AND JOINTS.



REACHING FOR THE GROUND WITH AN ARM AND A LEG WILL INVARIABLY RESULT IN AN AWKARD LANDING.

LESSON #10

GEAR INSPECTION AND MAINTENANCE.

Gear maintenance is essential to the performance of your parachute. Every component of your gear has a lifespan and keeping track of how it is wearing is your responsibility, after all, you are the pilot and it is your life that depends upon its functionality. It is solely the responsibility of the pilot to ensure that regular maintenance is performed. The best time to check the condition of your canopy is while you are packing it. Your tutor will help you inspect your equipment thoroughly.

EVERY PILOT IS RESPONSIBLE FOR CHECKING HIS OR HER AIRCRAFT BEFORE FLIGHT. If you use a system to check your equipment then it is unlikely that you will overlook any component that needs work. Start at your rig and work your way up to the pilot chute.

RIG. Is your reserve in date and noted on the data card?
Does your Cypress or AAD require servicing or batteries in the near future?
Is the webbing still in good condition or is it showing signs of wear?
(Lift webs, laterals and leg straps.)
Are the buckles in working order (i.e. do they hold the webbing securely in place?)
Are both closing loops in excellent condition and the correct length?
Is the BOC pouch in great condition?
Are your handles and riser covers well secured by the Velcro or tuck tabs?

RISERS Are your three rings assembled correctly?
Have you completed your monthly three-ring maintenance?
Is the locking loop in excellent condition?
Is the bendex housing routed correctly?
Has your RSL been assembled correctly?
Are your D links secured (finger tight + 1/4 turn)?
Are your link protectors secured and in good order?
Are your soft links showing signs of wear?

TOGGLES Is the Velcro and toggle keepers in excellent condition?

LINES. The wear points on your lines, generally occur at the attachment to the riser, at the cascades and to a lesser extent to the attachment to the stabilisers. Your brake lines wear the most as they are constantly being worn every time you apply brake, due to friction through the ring on your riser.

***BRAKE LINES SHOULD BE RE-TRIMMED OR
REPLACED EVERY 100 JUMPS.
LINE SETS SHOULD BE REPLACED AFTER 500-600 JUMPS.***

TRIM Get a friend to hold two front risers on top of each other, so that the links are directly on top of one another. At the canopy, hold your fingers between each of the A-lines. When the lines are new on most square and elliptical canopies the a-lines should all be the same length. As the lines wear the outer lines will begin to shrink first and therefore will cause the canopy to change its shape and flight characteristics. Get a rigger or advanced pilot to help determine whether the canopies trim is significantly deteriorated.

CANOPY. Inspect your canopy fabric for tears and any signs of wear.
Check the stitches on the seams for any signs of wear or pull.
Check the attachment point for signs of wear.

BRIDLE, BAG & KILL LINE Inspect for wear and loose threads.
Check the kill line for correct length. The kill line will shrink over time causing your pilot chute to not fully inflate during opening and not fully collapse afterwards.

PILOT CHUTE. Is the handle still secured well to the pilot chute (Throw Out deployment)?
Check the condition of the mesh and the fabric.

THE CONDITION OF YOUR PILOT CHUTE CAN CHANGE THE CHARACTERISTICS OF YOUR OPENING, QUITE SIGNIFICANTLY. ARGUABLY PILOT CHUTES MAY HAVE THE LIFE SPAN OF 500 – 600 JUMPS (ROUGHLY THE SAME AS YOUR LINES).



REGULAR MAINTENANCE IS CHEAP INSURANCE.
WITHOUT YOUR GEAR, YOUR FLIGHT WILL BE SHORT LIVED. WITHOUT YOUR INPUT YOUR GEAR WILL SIMPLY FLOAT IN THE BREEZE AND THEN FALL FROM THE SKY. LOOK AFTER IT AND IT WILL LOOK AFTER YOU.

The Jumps

The following notes outline the jumps that you will be performing on the day of your course. The jumps are designed to teach you some new skills that you may not have tried before. You should not expect to master these skills in just one day of jumping. It takes dozens and maybe even hundreds of jumps to master even the most basic skill. What it will provide is a repertoire of skills that you will be able to practice on future jumps and that will undoubtedly help you out of a difficult situation in the future.

On any every jump you should conserve your strength both mentally and physically for your approach and landing. Ensure you have a ***landing approach in mind BEFORE reaching two thousand feet***. Throughout the jump, DO NOT lose sight of the 'BIG PICTURE'. Remember to check the landing pattern and ensure that you have left sufficient time and room after the previous jumper. It is easy to get carried away and forget about your most important objective, landing safely.

These jumps will not necessarily be completed in this order but will be organised by your tutor so that everyone on the load has an opportunity to complete each exercise. The jumps are as follows.

FOLLOW THE LEADER; A series of two jumps where students take turns to act as the Leader and then the follower.

THE SLOW JUMP; A solo jump where the slower aspects of flight are explored, including rear riser turns and brake turns.

TUTOR JUMP; this jump gives the student an opportunity to be introduced to relative canopy flight with an experienced tutor.

TEAM SKILLS; this jump allows your students to extend their team flying skills from freefall into the canopy flight and ultimately landing.

The Slow Jump. SLOW IS SMOOTH AND SMOOTH IS FAST.

OBJECTIVES:

1. To do as short a delay as safely possible.
2. To explore the slow range of canopy flight using combinations of rear risers, toggle and weight shift.
3. To practice stall and recovery techniques.
4. To be the last one of your group to land. The slow jumper should exit last on this pass and perform a short delay. (approx. 2 seconds).

THE JUMP

The first two circuits should be performed with the brakes still set.

1st circuit: Rear riser turns.

2nd circuit: Weight shift.

Stall and recover the parachute using rear risers

Release Toggles.

Stall and recover the parachute using rear risers or toggles

3rd circuit: Rear riser turns

4th Circuit: Weight Shift

5th Circuit Braked Turns at waist level.

6th Circuit Braked Turns at shoulder level.

Stop your exercises by 2,000ft. Wave yourself off to remind yourself to concentrate on approaching the landing pattern.

STUDENT NOTES:

- Don't compromise your safety during deployment. If you are not stable after two seconds, then continue to free-fall until you are.
- Occasionally there will be the need to release the brakes upon opening to deal with a slider hang up or end cell closure. These problems can be dealt with by using rear risers. It is acceptable to leave your brakes set until a height that you are happy to cut away from (perhaps as low as 2000ft. What is your limit?). You will need to mentally rehearse not releasing your toggles immediately after opening as students instinctively do so.
- The reason for leaving your brakes on is to practice flight in the opening configuration of your canopy. With practice and time you will find that your canopy behaves very

differently to inputs during opening. Turns will be tighter and your input will have a greater significance.

- Weight shift turns may be achieved by several means.
 1. **LOOK** in the direction that you wish to turn.
 2. **LEAN** your upper torso towards and slightly forwards of where you want to turn.
 3. **LIFT** the opposite leg. To effect the turn you need to get the articulation point on the side that you are turning to, lower than the other side. To do so you need to lift your upper leg and hence your hips on the opposite side to the turn.

Place both feet together and extend them forwards toward one of the corners of the leading edge of the canopy. You can control the rate of the turn by moving them closer toward the centre of the canopy. After the turn is initiated, you may bring your legs to a position where they are more underneath rather than in front of your body. This particular type of weight shift will work better when the canopy is smaller and highly loaded than the average novice-intermediate canopy, though it will still work.

- Normally weight shift is used in combination with a toggle or riser input. It allows you to move as one with the canopy rather than causing the parachute to turn and then allowing your body to catch up. It is important to practice weight shift turns in isolation, to establish what affect it has on your canopy. The higher your canopy is loaded the greater the effect will be. The point of your skydive where you will notice the influence most is during the landing flare, particular if you reach out with one leg. This is simply because your weight shift has a greater influence the deeper that your brakes are pulled down.
- When performing a **stall** it is important to notice two things.
 - Firstly the feeling of ‘mushiness’ just before the stall actually occurs, which is called the **incipient stall**. If you ever feel this during the flare stage of your landing, then you should stop flaring any further otherwise the canopy will stall and you will drop out of the sky and probably land going backwards or on your back. You should be ready by this stage to do a PLR regardless, though this is when it is really going to matter. This is potentially a very hazardous situation that may result in serious injury.

- Secondly, recognise the feeling of the stall itself. The canopy will start to fall behind you as you swing forward. In order to reinflate the canopy you should do the following

1. **SLOWLY** lift the risers or toggles back to the resting position.
2. **SMOOTHLY** lift them, rather than abruptly letting them go.
3. **SYMMETRICALLY** lift them so the canopy reinflates in a straight line rather than causing the parachute to turn.

The canopy reinflation process may result in line twists if you are too abrupt or asymmetric. This is precisely the reason why you practice a stall at a higher altitude. (The higher the better)

- If you are jumping at a time of year where there are ample thermals, then you may actually be able to use your flat turns to stay at the same altitude or if your canopy is sufficiently large enough compared to your weight you may be able to ascend. This is a useful technique to use if you are on a long spot and need extra lift to help you get home. Thermals may be found commonly over hot, flat and dark surfaces such as roads, runways or paddocks. Your tutor will be able to further discuss this technique with you.
- During slow flight you may rest/anchor your hands on your harness to reduce tiredness. If the tiredness is still an issue, then give your arms a rest and continue to fly on full flight. If you are catching up to the rest of your group then make the decision early to land before them. Do not congest the landing area by arriving at the ground at the same time as everyone else. Use your initiative early and land somewhere else if the need arises.

Points to consider during the debrief:

- ❖ Was it easier to turn with your brakes on or off?
- ❖ Were you able to fly in deep brakes for long periods of time? Is this something that you need to work on?
- ❖ Were you the last one to land? Are you capable of 'floating' longer than the others?
- ❖ What situations might you need to do a braked approach?

The Tutor Jump.

OBJECTIVES. *To introduce the student to*

1. Relative canopy flight.
2. The effects of converging and diverging flight paths
3. The effects of turbulence and burble on a parachute.

THE DIVE

- ❖ Novice exits as Base and does a 4-5 second delay.
- ❖ Tutor observes students exit, follows after an appropriate interval then performs a shorter delay.
- ❖ Student aims to continue flying on aircraft heading whilst releasing brakes and observing tutors approach technique.
- ❖ Tutor flies to a relative point to the side. (Right side if doing a left hand circuit and vice versa)
- ❖ Tutor and student begin to fly a circuit together until a desirable heading is achieved ie. Downwind if a long way from the DZ or crosswind or into wind if closer to the DZ. Either instructor or student can give a signal to turn.
- ❖ Tutor flies straight and acts as a relative base while the student performs two slides using risers to move away from the tutor and then back towards one another. If front risers are utilised during the first slide then the student should use front risers to fly back to the tutor. Then use rear risers on the second slide.
- ❖ Student then dives their canopy down using both front risers, so that they are below, though still off to one side of the tutor. They may then rear riser back up to level with the tutor.
- ❖ Student floats, using rear risers until they are above their tutor's parachute (though still off to one side), then front risers back down to level.
- ❖ Tutor slides in front and student behind. The student should just be a couple of canopy distances behind the tutor and be able to experience what it feels like to fly in a canopies wake (burble). The student should then slide out of and back into the burble, exploring its boundaries. They should also try and float behind the tutor so that they can feel the burble on their body, not just on their canopy.
- ❖ Novice and tutor fly side by side again until 2000 ft. During which time the objective is to fly relative and to follow the leader. i.e. the tutor.
- ❖ After wave- off the tutor should float and the student should concentrate on completing a successful approach. The tutor's role is to continue to

follow the student until landing and then critique the student on their choice of turns, approach and landing.

STUDENT NOTES:

- ❖ Remember to anticipate slowing down when converging towards one another. A useful analogy is to visualise how a car should gradually slow down when you are driving towards a set of traffic lights as opposed to slamming on the hand brake when you get there.
- ❖ If you are feeling uncomfortable at any stage of this jump, then you can always fly towards clear air. i.e. If you are on the left of the formation then fly toward the left and vice versa.
- ❖ When multiple canopies are landing at a similar time, it is very important that you do not fly in the burble of another canopy. The last thing that you would like to experience when you are landing is wake turbulence.
- ❖ Even after a canopy has landed turbulent, (disturbed) air may still exist in its path for up to a few seconds afterwards, particularly if the canopy is highly loaded and flying fast.

POINTS TO CONSIDER DURING THE DEBRIEF.

- ❖ Did you feel comfortable flying relative to someone else in a predictable fashion?
- ❖ Did you notice how such a small input to create divergence might lead to a large separation in just a matter of moments? More importantly do you appreciate how convergence can happen very quickly if you're not paying attention?
- ❖ Did you appreciate the difference in the feel of your flight while flying in burble?
- ❖ Were you able to reach for all of your riser inputs without having to look at the grips?
- ❖ Could you feel the increase in speed of the canopy when you applied double front riser inputs?

The Follow the Leader Jump.

This exercise involves two jumps whereby each student takes turn at either being the leader or the follower.

OBJECTIVES:

The aim of this jump is to demonstrate the difference in glide path of different jumpers under differing wing loadings and throughout different manoeuvres. This will be easily visualised by the leader carrying a 50m crepe paper streamer.

The **objective of the leader** is to fly as predictably as possible in a circuit pattern. *The leader should keep track of ‘the BIG Picture’ so that both may make it to a safe landing area.*

The **objective of the follower** is to fly as close to the end of the streamer as possible. The follower should aim not to break the streamer. The follower should take note of the difference in steepness of the streamer as the flight path changes. The follower should also remain aware of *‘the BIG Picture’*.

Determine a pattern as a team that involves both faster front riser manoeuvres and slower rear riser or brake configurations. Plan to use the same type of turn for each of the four turns during the circuit. For the subsequent circuits choose another type of turn to practice. Your tutor will help you to determine a pattern that will help you to remain in relative flight.

Student notes.

- ❖ When you attach the streamer to your chest strap before you jump ensure it is adequately wrapped around at least 3-4 times. The remainder of the streamer should be tucked down the top of your jumpsuit. When you are ready to deploy the streamer, ensure that you have allowed more than an arms length of streamer as excess. Drop the streamer off to one side of your body. Watch it as it unfurls. The end of the streamer describes where you were 50 metres ago. Its angle scribes your flight path and acts as a great visual for the follower.
- ❖ When you fly slowly its path will flatten out and even begin to swirl as it trails in your burble. When the speed is increased through a turn it will increase its gradient.
- ❖ The follower should use the streamer as a relative base. Try floating to get above it and then dive by front risering in order to catch up to it. Try flying around it without breaking it.
- ❖ This jump is designed to teach you to work as a team. If you found it difficult to get together and stay together then with help from your tutor during your debrief you should experience greater success on the second jump.
- ❖ If a slower canopy is the follower then the leader should try flying on either rear risers or on brakes. The leader should aim to do flatter turns i.e. Rear riser or braked turns, in order to not lose too much height and hence increase separation during the turn. The follower should try to fly on the inside of the circuit, rather than on the outside of the arc.

- ❖ If the follower is a faster canopy then the leader should opt for faster turns such as toggle or front riser turns. The follower should fly on the outside of the arc in order to avoid overtaking the leader.
- ❖ Both team members are responsible for keeping track of the 'BIG Picture', especially the leader. Always know where you are in relation to the ground and to the other members of your group.
- ❖ If you break the streamer, then continue flying as if the streamer was still there. The streamer does add drag to your canopy and may cause you parachute to turn slightly if it a faster canopy and if you caught it on an outside line. Canopies are still safe to land with the streamers attached.
- ❖ After wave off at 2,000 ft, start to increase the gap between each other by floating as the follower and diving or spiralling as the leader. Once you have increased separation continue to follow each other until landing. If the follower is getting tired and is unable to fly their slot, then take the initiative early and overtake the leader. Ensure that you pass them on the outside of the circuit. Continue to communicate with one another by signalling your intention to turn. The leader should take the initiative if this is the case and float to increase separation.

POINTS TO CONSIDER DURING THE DEBRIEF.

- ❖ Was there are big difference in freefall time and opening time that caused the initial separation?
- ❖ Once you got together, was it relatively easy to stay together?
- ❖ Was everyone aware of '*the BIG Picture?*'
- ❖ Did you find it easier on the second jump to get together and stay together?
- ❖ Do you now have a better appreciation of glide angle and relative speeds?

The Team Skills Jump

OBJECTIVES:

- ❖ The objective of this jump is to apply acquired canopy skills into a skydive involving freefall.
- ❖ To demonstrate that flying as a team does not just involve freefall manoeuvres.

THE JUMP.

The group of five will exit the aircraft together, either linked or unlinked. Then build a simple formation and track away with sufficient altitude left to complete a canopy exercise. You might still choose to exit at seven or eight thousand to keep the costs of each jump the same or fly higher to get some extra freefall time. Either way the emphasis is on being in freefall together, safely separating by flat tracking and deploying so that everyone safely flies away from the centre.

It is important that everyone tries to deploy at the same altitude to keep everyone within close proximity. There will always be differences in deployment altitude and time taken to fully open.

By agreeing on a circuit pattern during the brief all team members should be able to fly back together and fly as a flock. To achieve this the team should...

- ❖ Work down to the lowest person by turning in a predetermined direction.
- ❖ The low person should begin to float and wait, perhaps by leaving the brakes set until the rest of the flock have caught up.
- ❖ The low person becomes the leader and should begin by flying towards the DZ and ensure that all participants will be able to make it back safely.

- ❖ Once this is determined begin to signal and then turn cross wind and then into the wind in a box pattern.
- ❖ Slower canopies should endeavour to catch up, on the inside of the turn, faster canopies on the outside of the turn.
- ❖ The team aim is to regroup in either a carousel or stair step formation.
- ❖ Once the team has reached 2,000 ft everyone should wave off and separate and land in a predetermined order
 - The order should be determined by canopy size and loading. Smaller, faster canopies should opt to land first and perhaps perform several dive turns and floatier canopies should opt to land last by flying in deep brakes to help the separation process.

BIRDS OF A FEATHER SHOULD FLOCK TOGETHER.



Feedback.



In order to make this canopy seminar better for future presentations, I would appreciate some feedback. Please write some constructive criticism about the events of today.

In what areas did you think you have improved?

Confidence, Ability, or Skill?

Was there anything that you really wanted to discover, but weren't able to?

How could the organisation of this event be improved?

Please feel free to write as little or as much as you like.

Thank you very much for your time and efforts today, I appreciate your comments.

Please e-mail your comments to sky_fire1@yahoo.com or post to 7/1 George Hanley Dr. Nth Wollongong NSW 2500.
