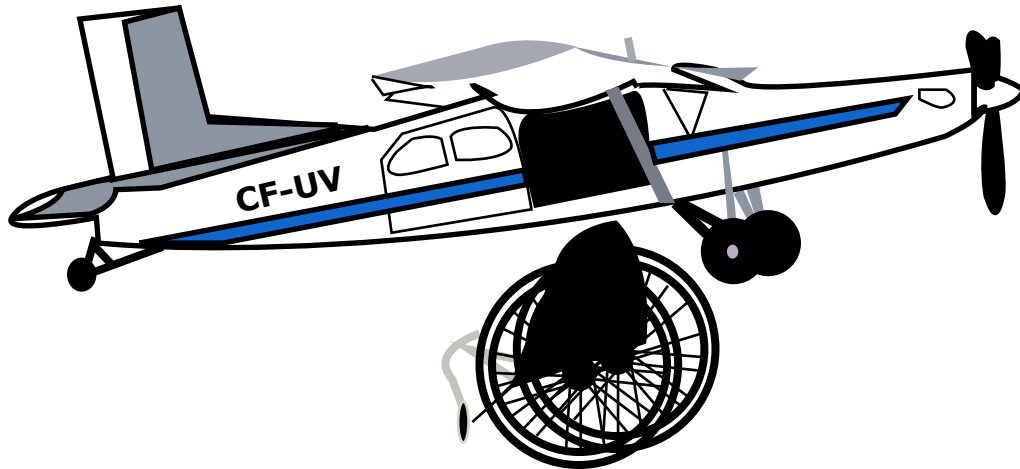


Adaptive Skydiving Manual



Author Rod Mack D-422 & Company (C) 2005

Please read and continue on to the manual©

All this Adaptive Disabled skydiving manual© and idea's were made when it was still the "Ultimate High Parachute Centre" Victoria BC Canada. Going forward you will see a progressive way for persons with disabilities to attempt a skydive by themselves. I have made this manual in combination with Tandems & PFF /AFF courses. I will waive the copyright on this manual if you wish to use it to be progressive, all I ask is that you put my name Rod Mack and Angus Smith the creators of the structure. I would ask too, if any instructor who has any experience with a disabled student or tandem, would share and I will add any new constructive chapter to the framework under their name. I suggest making and trying the "**Mack Straps**"© for Para Tandem passengers. In my case, out of all the disabled tandems I've done. I have done stand up landings 95% of the jumps using the "**Mack Straps**"© (Most para passengers I've taken prefer the stand up landing vs the bum slide or pea bowl landings. Landing sliding can also catch the passengers legs and the tandem Master could injure their passenger) Itguards against the JackKnife tandem fatalities as I have on Video as well.

All I ask is to add if you can, and use my name on the **Mack Straps**© if you construct your own . Plans are in the manual (<http://www.jagworksdesign.com/html/Para%20Manul%20opening%20page.htm>). I'm also looking for a chapter on a wind tunnel and any instructor who has taught any disabled persons in this situation. I am looking to push skydiving into the realm of what most sports do to accommodate athletes with disabilities. So please, if you have any constructive idea's or things you have done to enhance this manual email me(skydog3@tshaw.ca). (This is a Manual design for Para or disabled persons that have good upper body motor control, not to be discriminatory, it just requires good and strong upper body movement and control for obvious reasons and safety)Please only skilled DZ's and instructors try this please as it will take knowledge and skill. Like it would for anyone dealing with something progressive and new, But if you would like to please do. I'm hoping this is the beginning of combining all the skilled instructors' ways to help persons with disabilities to be safe and experience what we love. So please, add if you have knowledge I do not. I will add it to this Manual so it becomes national and international.

(Liability) Adapt a Waiver for the Students with Disabilities: This point has been brought to my attention by Fred Well. Do you or do you not have students and Tandem Passengers Sign a waiver? This signs their rights away against any mishaps. A waiver for the disabled student may have to be reworded with the add ins of the "Jack Knife" or "Landing mishaps" that could be a possibility. I'm putting out there to any lawyer skydivers to construct a Waiver designed to be Adapted for Students with Disabilities. so that the DZand Tandem Masters' do not feel threatened. We get regular Students signing their lives away why can we not make a waiver that is specific to a student who is disabled? This is so I can put up with this Manual an example of a waiver. thanks Fred.

I've had some persons question my ability (my skydive history) (<http://www.jagworksdesign.com/html/R%20Mack%20Skydive%20History.htm>) to have created this type of help for Tandem Masters and the able disabled. Well I started doing tandems from 1989 to 2003. I was taught by Graham P. Brown.... I have over 2,000 Tandem jumps. I have over 400 Disabled Passenger jumps as well with all types Para's, Quad's, MS, MD and disabled Old Age. So I have made the manual from my over 20 years experience. And I would not like to make this a compilation of all experience in North America, so if you have some experience to share, please do so. Do not take this

Manual idea as an approved Manual by CSPA or USP as it is based on my experience with Tandems for disabled persons and my years of teaching PFF in Canada. I have tried to combine the manuals of PFF/AFF recognized skydiving progressive teaching system in North America. I'm just trying to get the ball rolling and give attention to the "Able disabled" to experience Skydiving as we all love it! Please, I would like to make this a collaboration of all variations of positive Adaptive Disabled Skydiving situations.

Jump incidents that happened with a disabled tandem passenger with almost 100 tandems. He has said to me that on one jump he did sort of a half jack knife before it was names and piked so hard his knees hit him in the face and he got a bloody nose. So now he places his legs on his thighs to guard against his knees hitting him again. He also said that the "Mack Straps"© kept him from "jack knifing" out of the harness but still in a deep pike he was able to bring his body up and was able to get into a position enough for a safe landing and better control the tandem master had for a safe landing. He has offered copies of his signed log book entries for me to post when we meet again, so stay tuned. This manual with all the outside input from instructors and passengers is taking on a life of multiple situations and personalities of the Disabled skydiving community that is out there but never addressed.

Just a note, If anyone wishes to buy a set off off me because you may not have access to a commercial sewing machine or the Materials. I will make some for you at a cost of \$60.00 (\$50.00 to cover cost of materials & labor \$10.00 to put towards the RW team fund for the WPC 08) Just email me and when I receive your funds I will get them made and ship it to you.

If you want to talk live I'm MSN rodmack567@hotmail.com or email "skydog3@shaw.ca Adaptive Skydiving Manual© <http://www.jagworksdesign.com/Adaptive-Skydiving/Adaptive-Main-Page-Template.html>

PS. I still hold the intellectual rights (on all the *Mack Strap*© and strap adaptations on the legs and the Harness) so all I ask if you use my "*Mack Straps*©" or my *manual*© is that my name (Rodney Mack) is produced on it Please. An Idea, if you like the straps and make copies, may I suggest you cover your own costs and add \$10.00 and donate that to the 2 RW teams going to the WPC from Canada. Contact the CSPA if this is a good idea for you and our association.

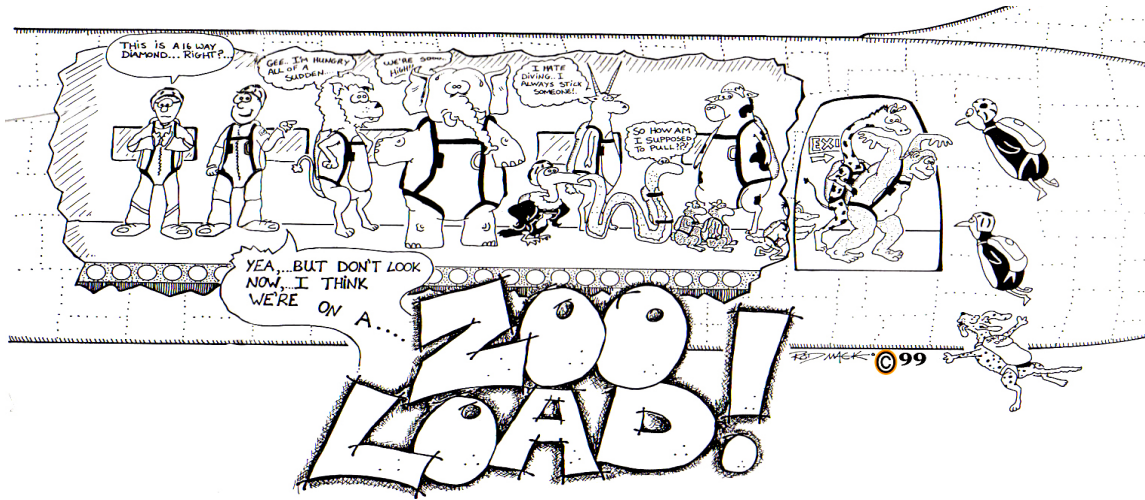


My skydiving history for those who do not know who I am Rod Mack D-422

Contact Rod Mack

Paraplegic Parachuting Solo program Skydive instruction Para extreme sports Paraplegic Skydiving

Introduction



By Rod Mack using combination of the PFF & AFF Tandem Guide lines set out by CSPA & USPA. May /2007

Permission is given to use this manual all, or in part to enhance, and do safely, tandems and para progression. The only thing I ask is you give me Rod Mack D-422 CSPA and other instructors listed below the credit for it. If you have a person going through this program, I ask if I could be invited to see the finished product as well please.

Rod Mack Manual author

c0-Author Angus Smith Parachute School of Toronto

Other contributing instructors;

Peter Hewitt (paraplegic skydiver)

Eric (Toronto) Stephenson is the South African AFF

Jim Wilson's' add PDF File Tandem Skydives with Wheel Chair Students

document that UPT, Strong Enterprises,

BPA and APF use in regards to tandem skydiving

Introduction

The following 'Adaptive' system (c) 07 is intended as a method to transition persons with leg control issues, such as paraplegics, into being fully capable SOLO skydivers. The Adaptive system© suggests the use of special purpose equipment, which serves to overcome some of the barriers associated with leg disabilities. The adaptive system highly recommends the use of the best practices used by able body persons, such as tandem skydiving, vertical wind tunnel training, Accelerated Freefall and Progressive Freefall.

The tandem skydiving system was developed as a relatively safe and controlled alternative student method, whereby the passenger/student is securely strapped to a highly experienced instructor during the entire freefall and parachuting event. The tandem system is also used to accommodate persons of various students disabilities, wanting to enjoy the thrill of skydiving, where previously it may not have been possible. Although the Tandem method has proven to be reliable for overcoming the limitations of a student's disabilities, it alone does not allow a student to progress to solo freefall.

Vertical wind tunnels (freefall simulators) are being used throughout the world as training bases for novice, intermediate and highly experienced skydivers. The tunnel provides a stress free (no worrying about opening and landing a parachute) and controlled environment in which to introduce a novice skydiver to the mechanics of body flight. It also allows very close scrutiny of the student during all freefall activity. Skill development is greatly enhanced and accelerated when using a wind tunnel. Tunnel training is HIGHLY recommended for persons with any disabilities, as it allows the instructor and the student to assess the effect(s) that a disability may cause in a freefall situation. It also allows any special actions, procedures and equipment to be developed in a short amount of time, without a great amount of risk.

The Adaptive Freefall Program© is intended as a supplement to existing conventional student freefall training methods such as AFF, PFF or Tandem Hybrid programs. This Adaptive program© is based on information collected from instructors and students that have developed their own techniques through trial and error.

The information contained in this document has been collected from various sources, but under no circumstances should it be considered the definitive document. There is no substitute for experience. Only HIGHLY qualified and experienced instructors should attempt to train disabled students for solo freefall.

Peter Chapman Toronto, ON (Liability)Adapt a Waiver for the Students with Disabilities: This point has been brought to my attention by Fred Well do you or do you not have students and Tandem Passengers Sign a waiver? This signs their rights away against any mishaps. a waiver for a disabled student may have to be reworded with the additions of the "Jack Knife" or "Landing mishaps" that could be a possibility. I'm putting out there to any lawyer skydivers to construct a Waiver designed to or for a student who is disabled. So that the DZ and Tandem Masters' do not feel threatened. We get regular Students signing their lives away why can we not make waiver that is specific to a disabled Student? This is so I can put up with this Manual an example of a waiver. thanks Fred I'm not putting restrictions on this manual but it's mainly designed for paraplegics with upper body mobility or head injury or stroke victims that have cognitive ability to perceive and comprehend all that is taught or exercises that need to be completed in physical and mental abilities. You may require a letter from a neurological Dr. stating that the cognitive ability to fully comprehend what they are getting into, and the dangers, possibilities and the comprehension of the waiver they will be signing (signing your life away)

Just so the awareness is there, a student needs to have a lot of upper body mobility and strength, so this progression is not for all disabled. It is for disabled persons with a lot of upper body control IE: Paraplegics with upper body fine mobility are a key student. This progression is aimed at the adaptive. We are not discriminating against those who don't there just is a minimum strength and mobility with upper arms that is required as a

minimum. So it will be up to the current instructor in Disabled skydiving that will assess a student's qualifications. Please realize there is a minimum physical ability and mental ability (awareness) required to make a safe skydive otherwise, I suggest doing just a tandem (With the "Mack Straps©" for Tandems) as a passenger for safety reasons but still getting the positive feeling of the sport.

So I'm starting a new book with the potential of a new and pioneering way that Adaptive(disabled) people can take a structured progression to skydive by themselves. I was once an international skydiver but had a bad landing that put me on ground zero again. So, I'm now trying to devise a way of a structured progression for Adaptive (disabled) people to skydive on their own. I'm suffering from right side paralysis and some brain damage. So I'm coming from an experienced instructor in the CSPA instruction system. So I'm starting off from square one. I'm being helped into achieving my goal of being able to jump by myself again. So, I am going to write about how, as an instructor that used to be and now from a disabled (Adaptive) person now.

Well: I realize that this may not be a money making position because of all the time needed to accommodate an Adaptive Student. So I'm putting this out there for instructors. (A suggestion, outside instructor harness grip on student and foot on the step leaning on the strut, in plane instructor sitting legs out, and if possible pull the student up on their lap and in co-ordination with the outside instructor, 1,2,3, lift up and out away from the step) that would help and push their own experiences to the limit and learn in the process. I think it would be a progressive way to enable the disabled with good upper body co-ordination, as it is an important part of this system. Someone with the experience and teaching ability could teach this type of disabled Tandems and PFF/AFF progression but, as I've said it will take more time and effort so it might not be for every DZ. DZ's with larger planes and more experienced instructors, it could work. Or even the military could perhaps take this on too. It will take some experienced instructors and tandem instructors to make this work in a progressive way.

Please Note:

Please note that all Adaptive athletes are all individuals. Each Student will have to be assessed I suggest in a wind tunnel. If a wind tunnel is not accessible, then have the Instructor to take them on a tandem jump and assess them for freefall. However, a wind tunnel would be the optimum place to do a freefall evaluation being able to see how they would be not strapped to a tandem Master. So if you are assigned as the instructor dealing with the Adaptive Skydive Program, we suggest doing the evaluation in a wind tunnel for optimum observation to access. All Adaptive athletes will all have various ways they adapt to a PFF freefall position. Some have to be aware that Paraplegics get uncontrolled leg spasms. This has to be taken into consideration for the Adaptive PFF Program.

Training Phases

The following phases of training are considered essential in establishing the feasibility of each individual's freefall abilities:

Tandem Training: The tandem jump phase is intended to introduce and familiarize the student with the various aspects of a freefall jump (plane ride, exit, stable freefall, canopy deployment, canopy decent and landing). The total quantity of tandem jumps should be at the instructor's discretion, as the student must display the freefall awareness and canopy control skills necessary to allow them to progress to the instructor assisted freefall training program (AFF, PFF, etc...). It will be necessary to have the student participate in the first jump course after completion of the introductory tandem jump. The objectives of the tandem training phase are as follows:

- ***Aircraft familiarization (see below)***
- ***Stable body position on exit***
- ***Stable and relaxed body position during freefall (wind tunnel training suggested)***

- *Altitude awareness*
- *Canopy deployment at a predetermined altitude (AFF/PFF instruction)*
- *The ability to recognize a functioning canopy (observation of this is required)*
- *Ability to locate emergency handles (upper body mobility)*
- *Adequate canopy control*
- *Landing area navigational skills and hazard recognition (cognitive ability)*
- *Acceptable flight patterns, including wind direction awareness*
- *Adequate landing technique (each situation should be evaluated)*

It should be noted that an emphasis should be placed upon canopy and landing skills, as the repercussions of an off-site or hard landing are much more serious than that of a person with full leg use and mobility.

At some point in the tandem phase, it is recommended that the special equipment described above is introduced and utilized. This will allow the student and instructor to become familiar with the idiosyncrasies of the equipment prior to them being used in the solo jump phase.

Note: The tandem jumps do not necessarily need to be completed prior to the wind tunnel training. It may be advisable to conduct the wind tunnel training immediately after the introductory tandem jump and upon a student's decision to proceed with freefall training. Another thought is to split the tandem phase into two portions (freefall introduction and advanced canopy control), so that the student is more current with their canopy control techniques just prior to their solo jump training.

Wind Tunnel Training:

The wind tunnel is an essential tool for safely determining a disabled student's abilities in freefall. The wind tunnel is a freefall simulator, which provides a controlled 'laboratory' environment in which to develop a student's ability to maintain stability. The result of the tunnel training may show that the student's abilities are such that they should NOT proceed with solo freefall, due to safety concerns. Look also at trying out the freefall jumpsuit or pants desired for the Stages of wind tunnel and freefall.

Freefall stability training should place emphasis on being relaxed. As with any student, relaxation of the body is the key to achieving a neutral, stable freefall position. It is much more important with persons that rely mostly on the use of their torso and arms for freefall control.

It is recommended that at least two qualified instructors are present in the tunnel during the stability training, in order to safely contain the student's unintentional movements and to adequately observe the student's body positions and reactions.

As in freefall, wind noise eliminates verbal communication capability; therefore predetermined hand signals MUST be worked out and practiced prior to entering the tunnel for the first time. These signals should be simple and allow the student to fully understand entirely what the instructor is requesting. There should also be signals between the instructors that allow them to communicate each other's intentions.

The wind tunnel activities should be as follows:

- Low air speed introduction. This allows the student to familiarize themselves with the effects of their actions, with respect to the airflow, without having a drastic sudden response.

- Increasing air speed stability development. The student's progress should determine the rate and amount that the air speed should be increased. The air speed is to be increased as the student has demonstrated the ability to remain in control at the current speed. Continue to increase the air speed until normal freefall air speeds are

achieved (approx. 120 mph).

- **Full independent stability.** The target for the students is to independently (unassisted) control themselves, in the tunnel, at full air speed.

- **Tunnel training periods** should be limited to 15-minute increments, in order to verbally debrief the activities. I would suggest that between two and four, 15-minute periods would suffice for the student to accomplish the basic stability requirements.

- **Once reliable stability is achieved,** freefall exercises may be introduced. It is recommended that the student and instructors rehearse the activities that will be introduced during the solo training (such as AFF/PFF Level 1, 2, 3...). It is also recommended that 'jump timing' be introduced into the tunnel training. This will help prepare the student for the altitude awareness skills that will be absolutely required in the solo training. The AFF/PFF style clock altimeter can be used for this purpose. If the 15-minute period is utilized for these exercises, then it is best to repeat a single dive multiple times rather than exercising multiple dives during a single tunnel session.

- **Parachute deployment exercises** are also recommended to ensure that the student understands the requirements for maintaining a stable reliable deployment sequence. A pilot chute simulator (strap on handle) is recommended, as long as it is effective in demonstrating realistic deployment technique. It is advisable to increase the student's deployment altitude by at least 1000' in order to compensate for the added complexities of their equipment (leg lifting straps, knee braces).

Freefall Training: Once the student has fully demonstrated, in the wind tunnel, their abilities to maintain stability and to perform the basic requirements of solo training, then they are ready to progress to the solo training stage. It should be noted that the time period between they tunnel training and the solo training should be kept to a minimum, in order to keep the skill and muscle memory advantages. It is also recommended that a tandem jump be completed just prior to conducting the first solo training jumps. Keep CURRENT on all skills!!!

Stage 1) the first move I will make is getting a DR's notice that I will not have another brain injury if I'm involved in a hard parachute opening. As I had some very little brain stem damage and there is little known about brain injury's and there affect with skydiving. Just check with your DR about outside actors IE: internal, bars or pins that may be effected on a hard landing that would effect most able body people but they may have to have a harness that is designed or set of "**Mack Straps**"© that would help them get their legs up and out of the way on landing see Fig 2 for drawing of and idea for the "**Mack Straps**"© that works. Before my accident I had done over 300 adaptive tandems where I had to make sure the legs positions were in such a way there was no danger to the passenger in free fall or on a regular or bum slide landing. Also something that has been put in the public eye now due to an accident is the possibility of an adaptive passenger with little leg control may slip out of the harness due to a hard enough opening. So there is a modification that is out there for a student tandem harness I also have an idea for or to modify an already existing harness.

Student skydivers are taught stability by holding an arched body position as follows:

- ***Hips pushed forward (arched)(wind tunnel or creeper demo)***
- ***Head held back***
- ***Arms outstretched and pulled back***
- ***Knees bent at approximately 90 degrees***

- Legs held wide apart

Lack of leg control in freefall presents a two-fold problem. Firstly legs are a significant control surface for freefall, so without control over the legs, a skydiver is at a disadvantage. Also, if the legs are unrestrained, they become a detriment to achieving and maintaining freefall stability. In order to overcome the lack of leg control, specially developed equipment may be necessary to achieve the knee and leg positions described above.

It should be noted that an emphasis should be placed upon canopy and landing skills, as the repercussions of an off-site or hard landing are much more serious than that of a person with full leg use and mobility. At some point in the Tandem phase, it is recommended that the special equipment described above is introduced and utilized. This will allow the student and instructor to become familiar with the idiosyncrasies of the equipment prior to them being used in the solo jump phase.

Note: The tandem jumps do not necessarily need to be completed prior to the wind tunnel training. It may be advisable to conduct the wind tunnel training immediately after the introductory tandem jump and upon a student's decision to proceed with freefall training. Another thought is to split the tandem phase into two portions (freefall introduction and advanced canopy control), so that the student is more current with their canopy control techniques just prior to their solo jump training.

Leg Braces: There are some commercially available leg/knee braces available that have adjustable knee angle brackets. The adjustable braces are ideal for determining each particular student's neutral knee angle. It may be required, depending on the student's tendencies, to make the knee position slightly more OR less than 90 degrees. The adjustable units are acceptable in the initial development phases of the student training, but it is highly advisable that they commission custom built FIXED angle braces. The custom built braces should have the following features: ("Mack Straps©" are designed in such a way to go over braces as well - Rigid, protective shell, constructed from custom molded fiberglass, rigid plastic or carbon fibre, etc. This rigid shell provides the means to hold the legs in the required knee bent position, as well as providing some degree of leg protection, in the event of a harder than normal landing.

- **Padded**, custom fit, soft liner, which is comfortable against the legs. An impact absorbing foam, together with cotton covering is recommended.

- **Wide**, easily accessible tightening straps. These straps should be reliable and as simple as possible. Velcro is recommended, in order to avoid the use of protruding metal hardware.

The construction method described above is similar to the methods employed in any commercially available protective helmet (Protec, etc.). The leg braces should be worn under a suitable pair of pants or jumpsuit, in order to avoid snags and damage.

Refer to the photos below for some detailed examples of these types of braces.

Stage 2) The student should first take the standard first jump course for other student jumping information to fill in all questions and make sure they are ready to start with a disabled (adaptive) Progression which is very much the same in most respects but more like and eventually go to a PFF jump or AFF stage 1 after all the tandem jumps have been completed up to a proper level of awareness and ability.

Tandem Jump 1 Stage 3) First, jump tandem this is to determine how your body can react in free fall so always take video of the free fall and opening to see how your body reacts in free fall. If your body position is stable, in free fall as a tandem passenger good. If your legs move uncontrollably in free fall then there are ways and adjustable straps that are available to make your legs more stable in free fall examine the video and take notes

on any problems there are and how to correct them. Talk to an instructor about what could appear to be some difficulties free fall. Also look at your body position on when the parachute opens and see if there is a shift of body position in the harness as you go from over 100 MPH to 0 in a matter of seconds and the forces may vary from person to person. Try to look ahead and fix some or all of the observed problems before the next jump. Practice use of the “Mack Straps©” too. Pulling legs up and out of the way For a safe Tandem Instructor to land.

Tandem Jump 2 Stage 4) the second tandem jump video it for sure see if the solutions to earlier problems have been resolved in the video after the second jump. On the second jump have the student do fake training pulls by having a piece of paper in their harness to make a training pull and see on video if it is preformed the correct way. Brief the student also not to try to grab or pull anything on the tandem instructors’ harness this should be practiced on the ground till it is like a second nature or natural movement for the adaptive student.

Tandem Jump 3 Stage 5). There should be 3 repeats of the second jump with practice pulls and video debriefing after all to see any visible things in arm movement or free fall position to correct.

Stage 6) This the practice tandem harness should have a dummy cutaway and reserve handle so after being thoroughly briefed in the class room on a hang harness set up and practice a reserve activation procedure like a normal student would do. On opening of the tandem jump the student should do a practice pull of cutaway and reserve handle in proper order. And able to put handles into their jump suit as a normal free fall student is trained to do. If the disabled (adaptive) student can only use one arm in a fast motion such as a head or stroke victim then on the ground in the class room it should be practiced in a way that the student practices using a one arm motion for both handles sometimes difficult but with practice it will become more of a natural movement This should be determined in the hang harness on the ground before the next practice jump The Student should do at least 3 jumps this way videoed and debriefed for each jump with a qualified tandem instructor or first jump instructor. The student must prove to the tandem instructor that he/she is able to steer in a correct manner and flare the parachute at the correct moment before landing and that on at least 3 jumps the inflatable rubber butt pad used by adaptive students is properly inflated and set up by the student for landing in the proper manner

Tandem Jump 4 Stage 5). After proving all the actions on these jumps and it’s in the best interest and safety of the instructors and student a stage 1 PFF /AFF can be fully trained and attempted and briefed to the student. A final written test shall be given to the student to see he/she is fully prepared and aware of what is expected the student is to complete in the PFF section of the disabled progression in skydiving. Both PFF instructors should be briefed in the disability of the student and what he/she needs to be looking for and be able to signal how to correct it in the free fall part of stage 1. The student is to be equip with a ground to student radio so that they can hear a direct instructional instructions from the ground instructor to make sure that the student does not miss all the equipment he/she has to see is fully put in place before landing as there are allot of equipment to be in place for this adaptive student must be aware of or reminded of for a safe landing after stage 1 PFF.

Tandem student Landing awareness: A well planned approach makes good landings easier to accomplish, while most bad landings come after a poor approach. It follows then, that working on improving a variety of approach techniques is the first step. Control your canopy with smooth toggle movements. You may not even realize how slow you can approach and still be safe. Its better to practice in good conditions so that you are prepared for the worst. Most new canopies can be flown straight in, even at very high wing-loadings, with proper technique. If you can’t do it, you probably need to work on technique. Stay with straight-in approaches, working on flaring technique for many jumps to obtain the longest swoop possible before attempting any turning approaches, you should, work on technique. Over a period of many jumps, find out how much you can vary the altitude loss in a turn by using different control inputs In these experiments you will find that some techniques will produce extremely high altitude loss with only a moderate rate of turn (Example: Steep front riser spiral). Starting real high and knowing many turning techniques allows you to have plenty of outs. Try to start all your turning approaches

with enough altitude to make the high altitude loss turn safe. Choose the turning method you feel is appropriate, for your level of skill or ask an instructor for advice too.

PFF/AFF Stage program and things a student has to achieve. After, fully passing all Tandem free fall and equipment requirements.

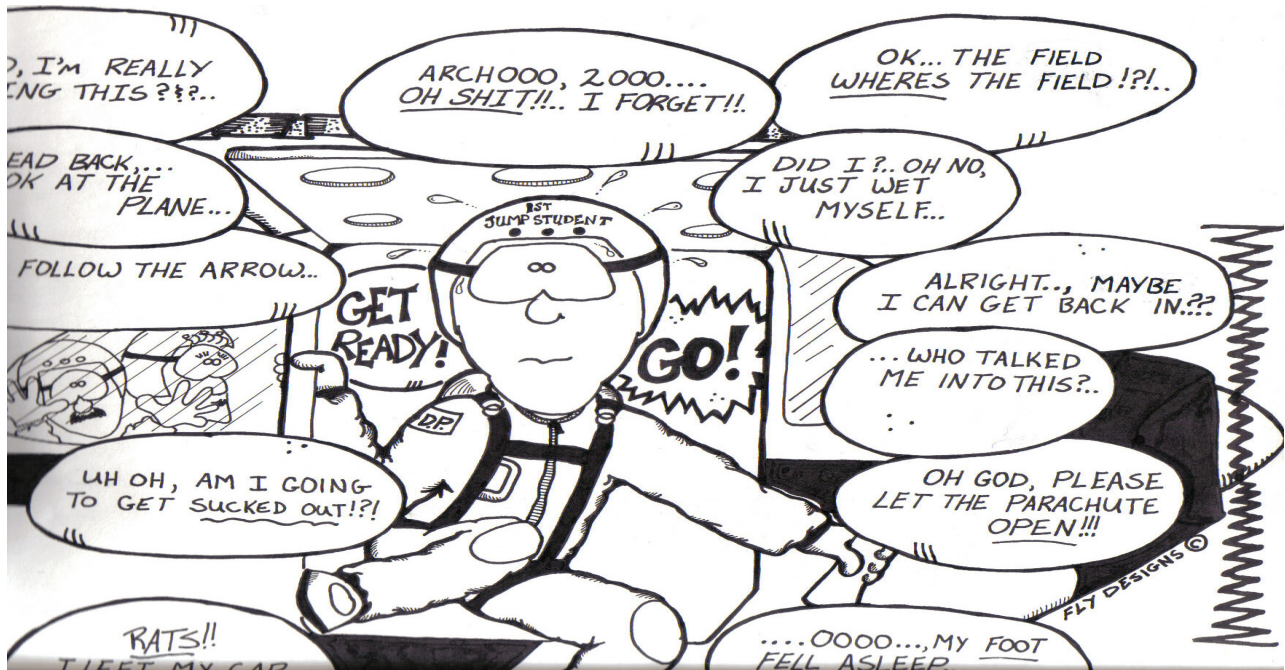
Modified Exit Position: (for a cessna), Because the student can not do a poised exit a modified position for exit into the PFF/AFF stages will have to be up to the instructors. One would have to be outside the student sitting facing front with the other instructor doing the normal grip. Making sure the Students legs are clear of the step to avoid a mishap or connection with the plane that will happier the exit. Or a one movement “Go!” Where both instructors leave launching the student and using their holds to get the student into the correct free fall body position. Then follow the jump situations to continue. Also make sure instructors and student debrief with the video. Making sure there are no problems that need to be addressed. The exit will have to be a feel thing for instructors and student. But making sure of good holds before exits are very important to get the student into a free fall position. For Exiting a Twin otter or bigger aircraft I’m just asking the experienced instructors to accommodate the exit as they best feel possible and safe. Larger aircraft allow for an easier exit plan. Using the harness leg holds, and arm grips getting the student to the door and then as practiced on the ground a singular exit movement by instructors 1,2,3 carrying the student in one motion to stay together out the door into the air force and free fall.

Leg Lifting Mack Straps (C) (to be used for tandem Passengers):(When looking at stage 1 and on please look at the freefall pants design by Angus Smith of Parachutes Toronto,see pictures below) To facilitate smooth landings, it will be necessary to have the student lift their legs up prior to landing, similar to the technique used during tandem jumps. This can only be practical if the student’s hands are free to perform canopy and landing control requirements. A pair of leg lifting straps, with integral tightening hardware (e.g. chest strap Velcro), is a method to achieve this requirement. These “Mack Straps©or the Angus designed freefall pants” are most effective if they are used in freefall. A system that is proposed comprises of “Mack Straps©or the Angus designed freefall pants” are Velcro on, at the knees. The top of the strap has quick connect hardware(Velcro) that allows it to be attached to the chest strap of the parachute harness this way it will not interfere with any Parachute attach or release system. These “Mack Straps©or the Angus designed freefall pants” should be well secured for freefall (velcro or snaps), and be easily accessible once the student is ready to lift their legs.

The use of these “Mack Straps©or the Angus designed freefall pants”, and the sequence of there use, should be introduced during the tandem training phase. The leg lifting activity should commence once the canopy and navigation check list has been completed. Namely, the student should **FIRST** identify that they have a serviceable parachute and that they are in good geographical position for landing at the target before worrying about pulling up their legs for landing. Conversely the student should be trained to complete this activity as **SOON** as possible, in order to avoid rushing at the last minute before landing.

Refer to the photos below for some detailed examples of these types of leg lifting straps.

Large Parachute: It is imperative that the student is able to perform low speed landings. This requirement is accepted practice for able-bodied students, but it is much more critical for student with leg disabilities. In order to achieve a low speed landing, the parachute size and performance characteristics must be selected to allow for the parachute loading. Depending on the student’s weight, it may be necessary to select a parachute that is larger than a conventional training parachute, such as a tandem parachute. Do **NOT** take chances with parachute size!!! Bigger is better!! Saying this, special consideration must be taken to allow the student to jump in windier conditions. A low weight to parachute size ratio will decrease the forward air speed and the ability to penetrate into the wind. Do **NOT** take chances with wind conditions!!!



Skydive Stage 1 Free fall Introduction

Done by PFF/AFF Instructor

Inst. Int.

Preparation Skills

- Physical Rehearsal
- Relaxation
- Review, In-flight & Canopy Skills

In-flight Skills

- Seating & Movement & equipment check fully
- Verbal review, Exit, Free fall, Canopy Control
- In-flight handles check
- Assisted exit (see an Instructor A/PFF)

Free fall Skills

- Stable modified exit with instructors
- Observation circle
- Altimeter use
- Main activation

Canopy Control Skills

- Canopy verification & and landing equipment set up after canopy open and ok
- Flight control check release brakes set up legs and landing pad
- Full glide turns

Landing technique as explained by instructor or ground to air communication

Equipment Skills

Setting and mounting altimeter with assistance

Main canopy activation technique

Technical Knowledge

Unusual situations in free fall for a disabled student

Instructor _____

Comments _____

Skydive Stage 2 Turns: Start and Stop Done by PFF/AFF Instructor

Inst. Int.

Preparation Skills

Physical rehearsal(in and out of classroom)

Relaxation (breathing control)

Mental Rehearsal

In-flight Skills

In-flight handles check

Orientation if the student can look out of the aircraft with instructor

Observation of spotting

Assisted exit (see an instructor A/PFF for the modified exit)

Free fall Skills

Observation circle

Box position, as well as straps are set up and awareness from instructors

Arm exercise

Leg exercise(not applicable as a paraplegic student)

Heading control (using arm and upper body movement)

Canopy Control Skills

Toggle spirals (after landing gear is set up and in place)

Observation of drift

Landing technique

Equipment Skills

Wearing and adjusting gear as the student picks up to get familiar with this modified student situation)

Setting altimeter

Technical Knowledge

Model for spotting

Model for free fall (where it is applicable)

Instructor _____

Comments _____

Skydive Stage 3 Turns: 90? and 180? Done by PFF/AFF Instructor

Inst. Int.

Preparation Skills

Recall & awareness (very important)

Mental rehearsal

In-flight Skills

Spotting with assistance

Exit heading control

Verbal review

Assisted exit (see instructor AFF/PFF)

Free fall Skills

90° -180° turns after being instructed how to utilize the students upper body and arms to insinuate the turns

Box position (as much as can be imitated)

Canopy Control skills

Stall practice (all these moves are to be made after landing legs up and landing pad is in place and secure)

Observation of surface winds

Landing technique (using radio communication to help instruct the student for this modified way of landing)

Equipment Skills

Safety check (all gear before and after so that the adaptive student comprehends what special equipment the need to be aware of for a safe jump and landing)

Setting audio altimeter

Technical Knowledge

Free fall math

Model for canopy control (straight flight, turns, stalls)

Instructor _____

Comments _____

Skydive Stage 4 Turns Figure Eight Done by PFF/AFF Instructor

Inst. Int.

Preparation

- Mental Rehearsal
- Recall and Awareness
- Self-directed instruction

In-flight Skills

- Verbal review
- Pilot briefing
- Spotting unassisted

Free fall skills

- 360° vertical axis rotation (using a modified technique of mostly upper body movement)
- Altitude awareness

Canopy Control Skills

- Stall Practice (all these moves after landing gear is in place and legs are up and locked and landing pad in place)
- Rear riser turns
- Observation of drift
- Observation of surface winds
- Landing approach

Equipment Skills

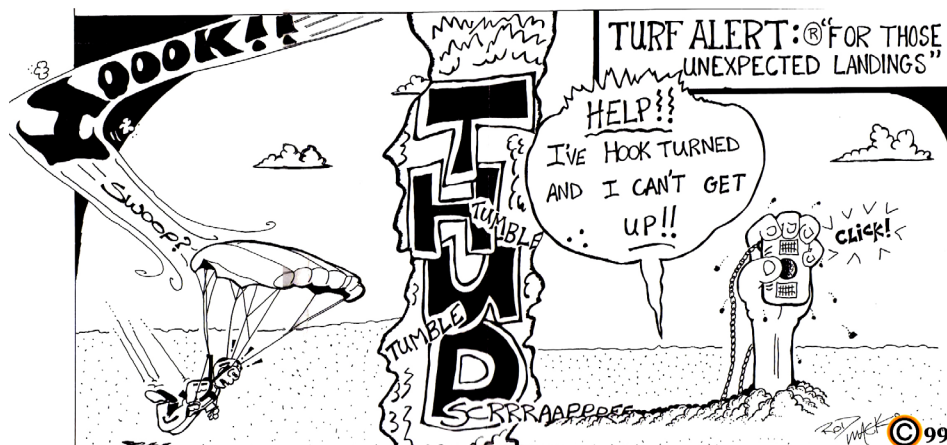
- Safety check
- Observe main packing (if this can apply or helping an instructor as much as possible)

Technical Knowledge

- Modeling for spotting
- Model for free fall control
- Self-supervision: evaluation of progress (this will be up to the instructor and abilities shown in the PFF program to keep a high safety standard)

Instructor _____

Comments _____



Technical Information

Mack Strap © System

- 1) Using the ankle strap should be in place**
- 2) Upper knee Lower thigh strap should be snug.**
- 3) Leg lifting chest strap attachment should be secure**
- 4) Landing Pad and Lower back support secure for free fall.**

If any questions on how the **“Mack Strap System ‘91”©** should be applied . Just a note, about the leg “Mack Straps©”. There was an incident in Victoria BC where Richard a Para tandem passenger (Me Rod C Mack D-422 Tandem instructor) almost jack knifed out through his harness and the **“Mack Straps©”** he was wearing saved him from falling though the harness. So even using the leg **“Mack Straps©”** on their, own can help. The “Mack Straps©” are a proven system since 1991 so please if wanting to copy or try it All I ask is you call it the “Mack Straps©”. Comment by myself this was before it was called a Jack Knife I said “hey man your body pikes (pike being a gymnastic term as I’m a gymnast too) up weird on opening”. I’m getting some signed log book entries to substantiate.

Comments from other Tandem Masters who have experiences to share,

1) Sometimes a system that seems to work on the ground to lift the legs may not work so well in the air. I don’t have the experience to judge how the system “should” work. I’ve heard of enough cases where the student manually lifted his legs for landing without using ropes or anything, but just a strap around the legs. But maybe the recommendation is to do a hanging harness test to double check that the exact combination of passenger and straps allows him to lift his legs OK.

2) If you think I’m right about it, there is that point about joints like ankles being much weaker than the rest of us would imagine, which adds risk one might not otherwise realize.

“Mack Straps” should only be used to help do disabled Tandems. The Angus designed freefall Pants are more suited for the PFF and Wind Tunnel portion of getting a disabled athlete to solo.

All I had was 36 lbs (see Picture) but it will take moreJust a note, If anyone wishes to buy a set off of me because you may not have access to a commercial sewing machine or the Materials. I will make some for you at a cost of \$60.00 (\$50.00 to cover cost of materials & labor \$10.00 to put towards the RW team fund for the WPC 08) If you wish to order E-Mail Me skydog3@shaw.ca May I suggest if not familiar with how the **“Mack Straps©”** work put student in a hang harness so they know the look and the tandem Master knows the look and how to lift up legs for a controlled landing hopefully standing up. Doing slide landings is more for the Tandem instructor who is inexperienced at using the”Mack Strap©” System. So use a hang harness like you would for any new equipment addition for both student & instructor.

There is a paraplegic in Victoria B.C. Para Rick in Canada who has preformed over 80 tandems, and experienced potentially dangerous body positions while skydiving. He has used the **“Mack Straps©”** on most of his jumps, and the **“Mack Strap System ‘91”©** insures that he will not accidentally “Jack-knife” out of his harness. He also had a few times got a bleeding nose from impacting his knees to his face on opening so he does not grab

the harness anymore he puts his hand out on his knees so as to protect his face. That is where the “*Mack Straps*©” effectively keep him in the harness without “Jack Knifing” out.

Landing alternative

Landing alternatives: if a ground landing with a foam or padded lower back and tail bone support are unlikely. Then the alternative is a water landing, Pool “if” canopy control is good or a lake, or the ocean if it is warm enough. Things needed will be a C02 inflatable life jacket so if free fall there is less bulk. A briefing on how to inflate the life jacket maybe practiced in the hang harness. Also if in a lake or the ocean it is recommended that a scuba diver is present in the capture boat in case anything out of the ordinary may happen. So that this into consists an alternative to a ground landing and is much safer too. Please use my manual when you can all i ask is I get credit for the procedures used if used. Also I suggest having elbow pads full face helmet in care a roll is a poss ability Another Alternative system, forwarded from Peter Hewitt (South African paraplegic skydiver) This system was devised by Eric (Toronto) Stephenson (South African AFF instructor) and Peter Hewitt. contact Parachute School of Toronto Other Para landing techniques If you think a chapter or two could be added then Please do and give yourself credit for the added chapter. One thing I do not have any experience with is a wind tunnel. So if you have experience with the disabled in a wind tunnel that would apply please add and send it to me so I can post it on this site with the manual.

Thanks please use and put North America first in devising a way for the disabled to skydive on their own , all the best

Rod C. Mack

(Author)

D-422 CSPA (4,000 jumps)

over 20 years an Instructor A,B

Instructor A & B

Rigger A

Coach 1 & 2

PFF instructor

Tandem Master of over 1,500 Tandems over 13 years, using the “*Mack Strap*©” System (over 400 Disabled)

Canada Team Member of 8 way & 4 way teams Vertical 8 Team Shred 4way attended 4 WPC 1991-1993-1995-1997

Modifications to a non shark whip harness adaptation



Detailed sewing points



Minna Mettinen Kekalainen (the only licensed to skydive para woman in the world) Pants that she had made for freefall



Modified Tandem harness for adaptive skydiving



Mack Straps (C) '91

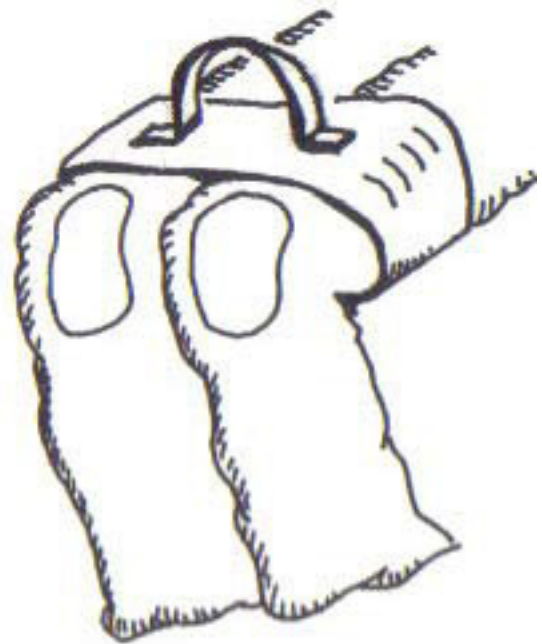


Mack Straps (C) '91



36 LBS

**suspended
Weight**



UPPER STRAP

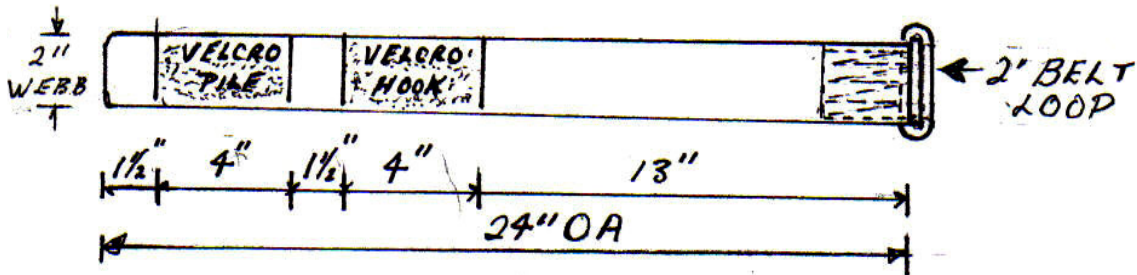


ANKLE STRAP

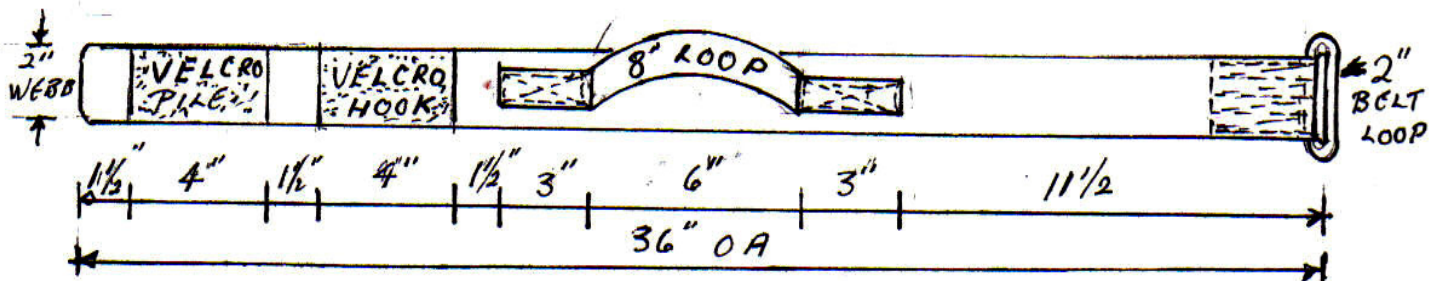


1991

MAC[©] STRAP



ANKLE STRAP



KNEE STRAP

Just a closing thank you page:

I would like to thank all who have contributed to the Manual Angus Skydive Toronto, Peter who is a skydiving Para. Also to Minna Mettinen Kekalainen who is the only para woman licensed skydiver in the World & in Canada 2001-2011

She has been an inspiration to lots of adaptive athletes. Also like to thank all at the Ultimate High Parachute centre formerly of Victoria BC Canada. So if I've not mentioned (***Peter Hewitt***) you please except my thanks. And to Bonnie of North Studio's that helped me get my book and graphic design experience.

Mention my family Da(Ron) & Mum (Marg) that have been with me through thick and thin of my recovery. Also my Kids Madison Mack, Carson Mack & Kareen their Mum. Para Rick who I did many Tandems with too.

I hope that this manual can be a starting point for other Adaptive Athletes to achieve their goal and live for each day...

Thanks
Rod Mack D-422 CSPA

Contact: ***Rod Mack*** email: ***skydog3@shaw.ca*** Address: 1414 Hillside Ave Victoria BC Canada
so please if you have anything to add contact me...

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ADAPTIVE SKYDIVING