SWS
Fire Tandem
Owner's Manual

www.sws.aero

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1. Introduction
1.2. Warnings

!!! WARNING !!!

Parachuting is a potentially hazardous activity that can result in serious injury or death.

Parachutes sometimes malfunction, even when they are properly designed, built, assembled, packed or used. The result of such malfunction is sometimes serious injury or death.

Worldwide statisticts show that for every 65000 jumps happens one fatality and approximately fifty injuries.

Some of these cases are the result of equipment malfunction.

When you use your parachute or allow someone else to use it, you are acknowledging all parachuting's risk and accepting the fact that parachutes can malfunction.

!!! THE USER ASSUMES ALL RISKS !!!

!!! ATTENTION – DISCLAIMER !!!

As the parachute sport and the type of equipment is associated with risk of death,
Sky Wide Systems makes no warranty, either expressed or implied.

Fire Tandem rig has been sold to you with all faults and without any warranty of safety. Sky Wide Systems disclaims any liability in tort for damages or injury resulting from a malfunction or from a defect in design, material or workmanship.

By using this rig, or allowing it to be used by others, the buyer waives any liability for personal injuries or other damages arising from such use.

If the buyer declines to waive liability, buyer must return the Fire Tandem parachute harness and container, before it is used, to the manufacturer within 30 days from the date of original purchase with a letter stating why it was returned. In such a case the buyer will be credited a full refund.

If you have started to use the Fire Tandem rig or you have failed to return it within 30 days of the original date of purchase, you assume all risks to yourself and waive liability on the part of the manufacturer.

!!! THE USER ASSUMES ALL RISKS !!!

!!! WARNING – THE USER IS RESPONSIBLE FOR HIS LIFE !!!

Be aware and follow the clear skydiving related guidelines and regulations.

Be aware and follow the clear parachute equipment related guidelines and regulations.

Use only equipment, that have been assembled from original components strictly in accordance with installation instructions by an approved parachute rigger.

Change/or have changed damaged, worn or obsolete components and equipment.

Never exceed the maximum weight or speed approved to your rig or change this requirement in your gear manual.

!!! YOU – AND ONLY YOU ARE RESPONSIBLE FOR YOUR LIFE !!!

1.2. Greetings from the designer

Dear user,

Thank You for choosing Fire Tandem harness and container system. When we were creating this rig, we tried to make it as safe and comfortable as possible.

Our goal has been – not just to produce one of the best rigs, but also it's continuous development and improvement with new ideas. Only in this way it is possible to adapt to the fast changing realities of sport parachuting.

Because of this it is particularly important to get feedback from you or from your rigger. Our assumptions cannot be compared to the results and experiences from the «field».

Any comments or experiences, no matter how small they might feel are accepted positively and with gratitude. Only the known things help us to make our sport safer.

We will support you – not only at the moment of purchase, but throughout the whole lifespan of your equipment. You will find that it does not matter, what you order – new rig or spare parts to replace the missing – we will always try to help you with all your questions.

Sincerely,

Alexey Sharadkin
Sky Wide Systems

2. System description

2.1. Certification and restrictions of use

Fire Tandem Harness-container system has been thoroughly tested according to test programme

FAA TSO – C23d

Fire Tandem Harness-container system has been tested and approved for CYPRES-installation by

Airtec GmbH

Fire Tandem Harness-container system has passed tests of material endurance by

Research Institute of Fiber Processing

As a result of these tests the following restrictions of use have been set:

Maximum exit weight (jumper with equipment + parachute)	**250 kg (555 lbs)**
Maximum deployment speed (max speed in which you are allowed to open the container)	**370 km/h (200 knots)**

Sky Wide Systems does not give any regulations of use or maximum lifespan for harness and container system.

Performing periodic inspections by an authorised rigger is a precondition for extending the use of your equipment.

Sky Wide Systems requires a technical inspection to be carried out when:

- Introducing the system into service
- In connection with every reserve repack (regardless of whether the reserve has been used or not)
- After using the system in unusual conditions (like for example landing into water)
- In addition periodically, every six months or following the regulations of the country where the equipment is used.

2.2. System components

2.2.1. System application.

Fire Tandem parachute system is designed for parachuting of 2 people – tandem instructor and a passenger, as well as a skydiver with a cargo container.

Appropriate main chute can be any chute that fits into the main container.

Appropriate reserve chute can be any chute that fits into the reserve container, and does not have any specific packing techniques (must use pro-pack) or special freebag design.

2.2. System components

The Fire comes complete with these components:

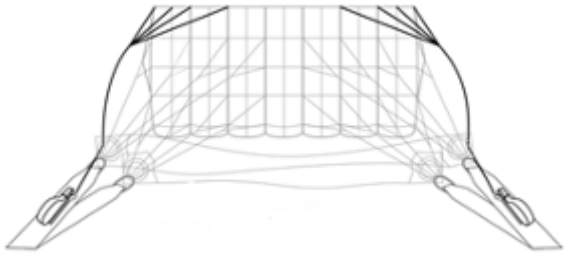
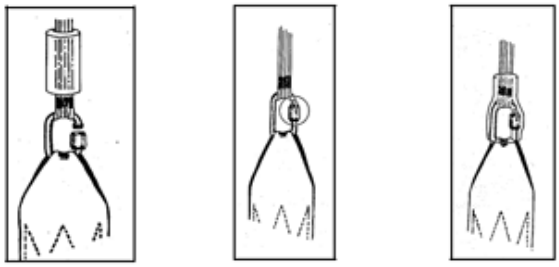
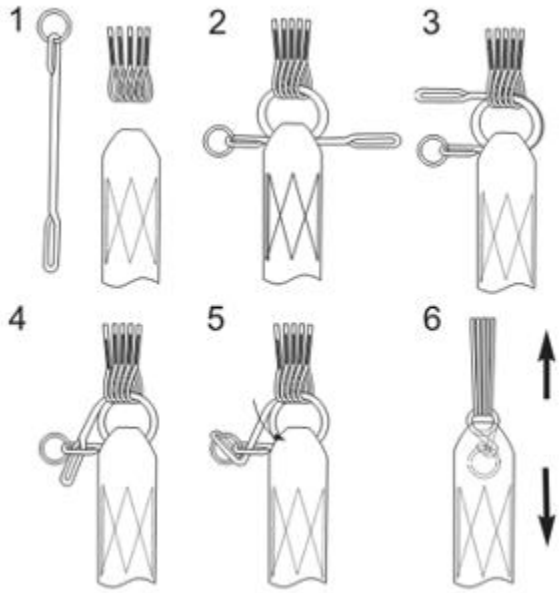
- Harness and container
- *Reserve toggles
- Main pilot chute and bridle (drogue)
- Main deployment bag
- **main risers and toggles
- Main cutaway handle (pillow or loop style)
- *reserve pilot chute
- *reserve bridle and deployment bag
- * reserve ripcord (pillow-type or loop style)
- repack log card
- Owner's manual (CD or paper)
- *RSL or DRD-lanyard (option)
- ***Reserve closing loop
- Main closing loops
- Rubber bands for main D-bag
- Drogue release
- Passenger harness

* Warning: replacement of these components effects in safety in a critical way. You are allowed to use original parts only. Use of any other components is ***stricktly prohibited***.

** Use of «turned» french-style risers is ***stricktly prohibited***.

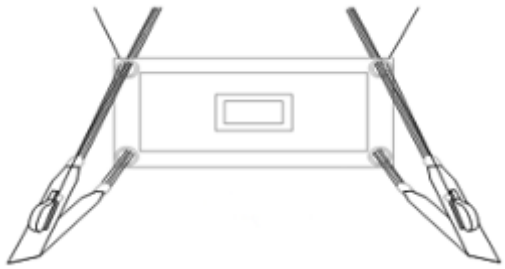
*** Use only 2,3 mm thick Microline CYPRES cord. Use of any other material as reserve closing loop is ***stricktly prohibited***.

3. Reserve packing preparations
3.1. Reserve assembly

3.1.1. Attach the canopy to the reserve risers following the canopy manufacturer's instructions.	
3.1.2a. If you use metal connector links - 1. They should be tightened by fingers to the point it stops 2. Tension the barrel 1⁄4 turn with a wrench. Position larger end of the link towards riser, lines to the other end. 3. Install a bumper to protect the link, lines and slider grommet. 4. Secure the bumper by handtacking	
3.1.2б. If you use softlinks – 1. Attach softlinks following the softlink manufacturer instructions. 2. Handtack the ring (tab) to riser to keep it in position	

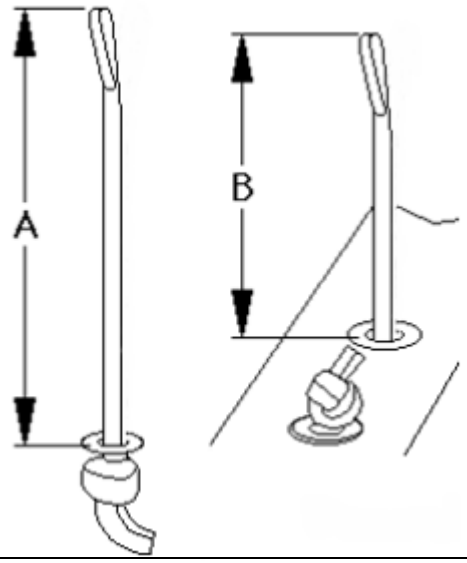
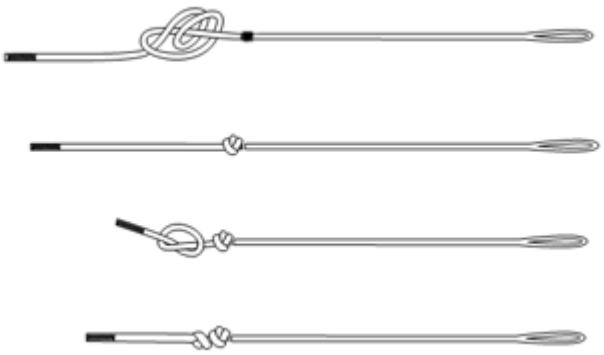
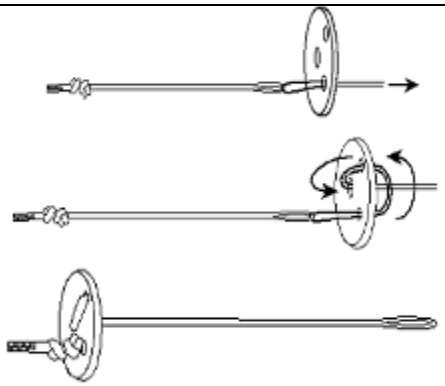
3.2. Attaching the steering toggles

It is important to follow the reserve canopy owner's manual directions before attaching the toggles to the steering lines. The reserve owner's manual contains important information relevant to that particular make and model of reserve canopy. The reserve canopy steering toggles are supplied with the Fire. These steering toggles are compatible with the Fire reserve risers. It is important to attach the steering toggles at the mark that is located along the steering line. If the toggles are mounted too far down the steering lines, the canopy may be less responsive and if the toggles are mounted too high up, the canopy may suddenly stall on landing.

3.2.1. Ensure the steering lines are correctly routed (i.e. they should not wrap around any suspension lines). Check that the steering line passes through the rear slider grommet and the guide ring on the riser.	
3.2.2. Locate the mark on the steering line that indicates the correct toggle location. Verify that both steering lines are symmetrically marked in the same way. If you find difficult to find the correct location of this mark, refer to the reserve canopy owner's manual. Make a finger-trap loop to the end of the line to fit the mark on the line. With Microline, tie and adjust an overhand knot to secure the finger-trap. Prefer sewing on Dacron lines, because the knot would be really big on these.	

3.2.3. Thread the end of the steering line through the hole on the toggle. Loop over the end of the toggle and draw tight Repeat the procedure for the other toggle. Inspect the installation. Check to be sure the steering lines are routed correctly.	

3.3. Installing the reserve closing loop

3.3.1. Use only 2,3 mm thick Microline CYPRES cord. Size of the finger-trap is 1,5-2 cm. Use of any other material as reserve closing loop is ***stricktly prohibited***.	
3.3.2. Install correct closing loop length as per rig label: **- A – from washer to the end of the loop** **- B – from the bottom of the container to the end of the loop** Measures are valid for pre-stretched loops.	
3.3.3. Take a loop and a CYPRES washer. Mark the length of the loop + 2 cm (it takes 2 cm to attach the loop to the washer) Tie a double knot on the mark and secure with a single knot as shown.	
3.3.4. Thread the loop through the holes on the washer as shown.	

3.3.5. Remove the thread and place a smooth metalbar in the loop and pre-stretch as shown. Inspect the length of the loop.	
3.3.6. If you use self-made loops, lubricate 5 cm from the end of the loop with silicon. (a silicon pad is included in CYPRES Packer's Kit)	
3.3.7. Install the loop to the bottom of the container threading it first through the rubber band covered «anchor-grommet» and back through the next grommet and the hole in the AAD cutter. Re-check the loop length.	

3.4. Installing the AAD

3.4.1. Install the AAD in the pocket at the backwall of the container. Note, that the cables of the unit must be at the bottom, close to the container wall. NOT the other way round.	
3.4.2. Thread the control unit and it's cable in it's channel on the base of the container and place it in it's pocket in the back pad. Excess cable can be placed as shown inside the channel. Make sure, that there is not too much loose cable between the control unit pocket and the channel.	

3.4.3. Thread the cutter to it's holder. Excess cable can be placed either in the velcro pocket or inside the AAD unit spandex-pocket. Make sure that there is not too much loose cable between the cutter holder and the device pocket.	
3.4.4. Thread the reserve closing loop through the cutter hole.	

3.5. Installing the RSL

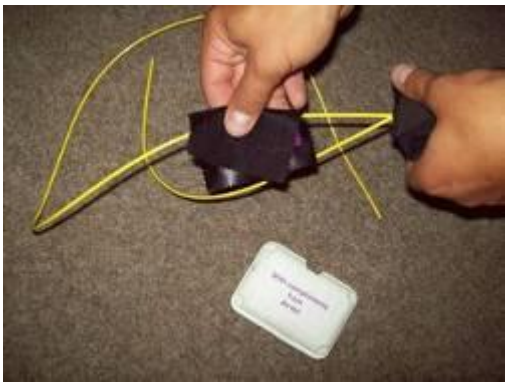
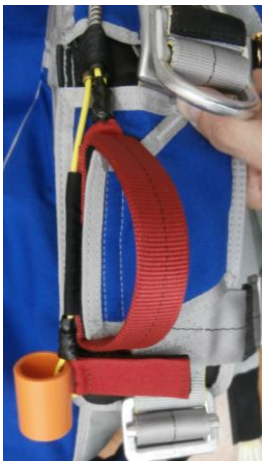
3.5.1.

Inspect that the RSL lanyard is intact.

Starting from the container side place the lanyard all the way to it's channel attaching the velcro.

Fold the lanyard and near the shackle end and insert the stump under the top shoulder flap.

3.6. Attaching the cut-away handle

3.6.1. Pick up the cut-away handle and inspect it. Pick up reserve drogue release and inspect it. Clean cables from dirt. Lubricate cables (use only pure silicon or silicon from CYPRES Packer's Kit).	
3.6.2. Thread the cables of cutaway handle to their housings. Thread the cable of reserve drogue release thry channel on cutaway handle and to his housing. Place the cutaway handle in it's pocket. Mate the Velcro of reserve drogue release, and place it under the harness.	

3.6.3.

Longer cable comes out of the housing at the neck under the collar.

Thread the cable through the RSL lanyard loop.

Thread the cable to the next housing until it comes visible at the end of the housing on the left side.

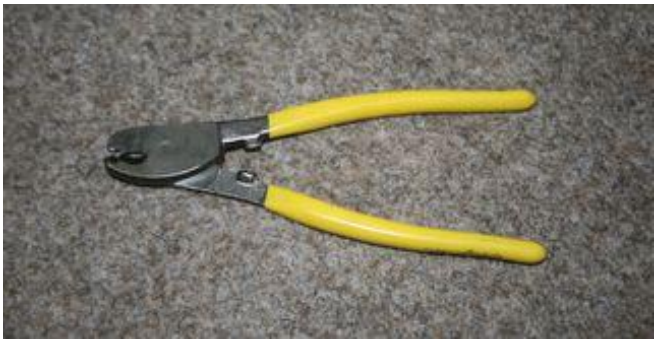
WARNING: Make sure that the cable is not hooked to the AAD control unit cable, with the reserve parachute ripcord or steering lines or other parts, before inserting it to the second part of the housing.

3.6.4.

Determine and measure the release cables sticking out of housing. The left hand side should be 140 mm and right hand side 160 mm.

Cut the cable to required length. (Preferably with cable cutter). Heat the tip of the cut cable with lighter and smooth the cable end with fingers to cover the metal core.

WARNING: this adjustment is necessary to make sure that the left 3-ring release opens before the right one (the side which the RSL is attached at)



3.7. Attaching the reserve ripcord

3.7.1. Take reserve ripcord and inspect it. Insert the ripcord cabel into housing and place the handle into pocket.	
3.7.2. Thread the reserve cable through RSL-ring and then through the guide ring. The RSL ring must be between the reserve ripcord housing and the guide ring. Mate Velcro on RSL lanyard with Velcro on top reserve flap.	

Addition for DRD packing (optional).

Before reserve packing, be sure to perform additional checks, described below, to insure the compatibility of DRD parts. The use of wrong size parts of the system can lead to failure of the parachute.

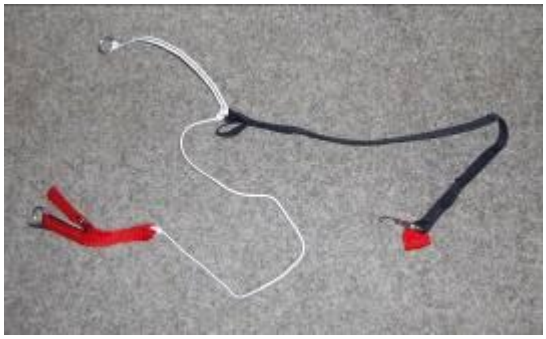
It is important to exactly perform the instructions, specified in the scheme of installation DRD. Errors in the installation or failure to comply with instructions may lead to complete failure of the reserve (reserve PC in tow), which can be eliminated only by RSL shackle release.

Reserve packing must be made with strict accordance with the packing manual.

In case you do not understand any part of the instruction - please contact the SWS company for more information.

1. Make sure the DRD anchor, located on the bridle, is properly oriented. Pocket of the anchor must be on PC side, and the loop – on the d-bag side.	

3.8. DRD system preparation (optional).

3.8.1. Place the DRD line on top loop of the RSL\DRD lanyard, under the ripcord line. Please note, the lower loop is used ONLY for the cutaway cable, no lines are mounted to it.	
3.8.2. Thread the reserve cable through RSL-ring and then through the guide ring. The RSL ring must be between the reserve ripcord housing and the guide ring. Mate Velcro on RSL lanyard with Velcro on top reserve flap. Place lower loop of DRD lanyard on cutaway cable, between housings. Insert the DRD trigger in the pocket on the inner top flap. Place the trigger line in the elastic pocket on the inner top flap. Note that the line is placed so that the first came out internal loop.	

4. Reserve Packing Instructions

4.1. Technical Inspection

Sky Wide Systems requires a technical inspection to be carried out:

- When introducing the system into service
- In connection with every reserve repack (regardless of whether the reserve has been used or not)
- After using the system in unusual conditions (like for example landing into water)
- periodically, every six months or following the regulations of the country where the equipment is used.

The inspection may be carried out by an appropriately certified parachute rigger.
Read the manual carefully before the inspection.

Object	Priority
Harness	Damaged edges, frayed webbing, broken stitches, condition of elastic keepers
Reserve ripcord: handle, pocket, ripcord cable, ripcord pin	Handle pocket, no kinks in the cable, termination ball, enough slack in cable, velcro, cable, housing attachment, housing condition
Main cut-away handle, pocket, cut-away cables	Handle pocket, damaged and dirty cut-away cables, enough excess cable in 3-ring releases, velcro, damaged housings, loose housing attachments
Container flaps	Damaged stiffeners, bent or damaged grommets, sharp and burred edges, improper installation
AAD installation	AAD installed following instructions, cables, control unit
Main risers	Damages: bent connectors, 3-ring release loop, togglekeepers, «frozen» 3-ring release rings
Reserve risers	Damages:: bent connectors, brake and toggle attachments
Main pilot chute, bridle and deployment bag, drogue release	Damages: grommets, worn rubber bands, kill-line, pilot chute fabric
Reserve pilot chute, bridle and freebag	Damages: Grommets, velcro, safety stow, bridle, pilot chute fabric and mesh, pilot chute spring, pilot chute attachment to bridle
Hardware	Rust, burrs, sharp edges, proper installation
Loops	Condition, correct lenght

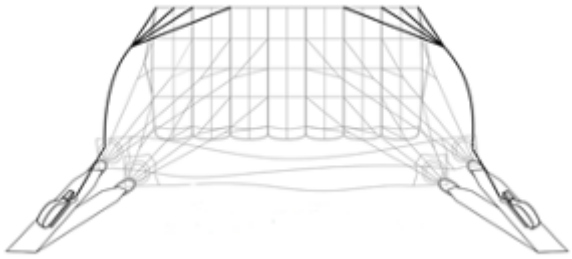
4.2. Required tools

List of tools:

- Weight bag (4 pcs)
- Packing paddle (2 pcs)
- Adjustable wrench
- Cranking device
- rule
- temporary pin
- tying cord (recommendation: microline 1000)
- pull through cord
- thread through rod
- owner's manual
- packing plate (preferably square)
- Silicon oil/pad (CYPRES Packer's Kit)
- Pull-up cord
- packing data card, rigger logbook, pen.
- seals, seal press, seal thread, stickers, tape, scissors, date stamp, rigger stamp
- hand tacking thread, needle

Recommendation:
Count your tools before and after the packjob

4.3. Setting the brakes

4.3.1. Inspect that reserve toggles have been properly attached.	
4.3.2. Set the brake by the riser line loop, then by the toggle, and place the excess line to the outside. Fasten snap. Mate Velcro on toggle and riser. Pull the steering line up (to the canopy), to remove the slack.	
4.3.3. Fold the excess line 2-4 times (depending on the lenght) and place in Velcro pocket.	

4.4. Flaking the canopy

4.4.1.

Flake the canopy following the manufacturer instructions.

Use only Pro Pack-method.

After flaking the canopy should look as shown in the picture.

4.5. Placing the canopy into the free bag

4.5.1.

Make the first S-fold to match the distance between freebag edge and grommet.

We recommend, that you use packing paddles to produce smoother and more accurate packjob.

Separate the slider grommets away from the centre and leave 10 cm between them.

The edge of the slider is to be appr. 5 cm more in than the edge of the S-fold.

4.5.2.

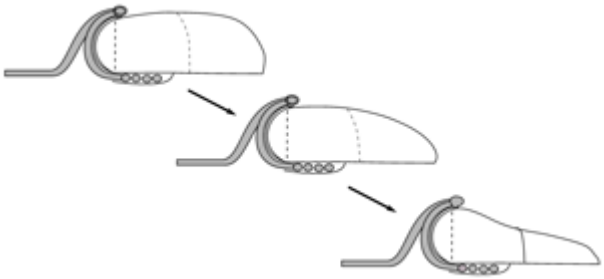
Place center of the trailing edge on top of the S-fold as shown.

Wrap the trailing edge around the cocooned canopy leaving only the nose outside.

Fold the nose in two and place them under the cocoon.

The width of the cocooned canopy should be the same or slightly wider than the mouth of the freebag.

4.5.3. Make another S-fold – the same size as the first.	
4.5.4. Divide the canopy in two creating two «ears».	
4.5.5. Lift the canopy and place the freebag under the canopy. Spread the center cell and slide it into the freebag in a way that the mouth of the center cell is left outside.	

4.5.6. Make the «ears» and make a fold at the level of the edge of freebag. Insert «ears» into the freebag.	
4.5.7. Close the bag with the safety stow The canopy should be appr. 5 cm out of freebag mouth to fill properly reserve container corners.	
4.5.8. Dress and shape the freebag to the form of the reserve container.	

4.5.9. Turn carefully the bag upside down to show the line stow pouch. Open the line stow pouch.	
4.5.10. Place lines in elastic stows.	
4.5.11. Close the velcros of the line stow pouch.	

4.6. Placing the freebag to the reserve container

4.6.1. Pass the pull-up cord to the reserve closing loop. Open reserve container flaps. Position reserve risers in the reserve pack tray. Fan the links and place the rear links to the outside to make packjob flat. Pass the pull-up cord through the freebag grommet.	
4.6.2. Place the bagged canopy in the pack tray taking care that the grommet in the packtray, loop and grommet in the freebag are in line. Keep the freebag in place with your knee and work freebag into the container filling the corners. Spread out the lower flap protector fabric.	

4.7. Closing the reserve container (with or without DRD)

Reserve container closing with DRD system (4.7.1 – 4.7.5).

4.7.1. Fold the «anti-twist» part of the freebag and the bridle on top of the freebag.	
4.7.2. Fold the bridle in the V-shape leaving 1,5 m unfolded. Loop on the bridle should be on the lower side, if not – make a half-twist in any direction.	
4.7.3. Close the inner upper flap. Make sure that there is no canopy left under this flap. Reserve loop goes through the ring on the DRD trigger.	

4.7.4. Make a bridle fold up, connect a trigger - inserting a red pocket in the pocket on the bridle, fix a loop through the grommet on the trigger by inserting a pin into loop, then in red pocket and hide in a pocket on the bridle. Fold the bridle, repeating the previous V-shaped folds.	
4.7.5. Close and pin the right side flap. Use the packing paddle to keep bridle stack in place. Repeat the same with the left side flap. Secure the loop with the temporary pin. Make room to the center and work the canopy material towards the upper sides of the container.	

Reserve container closing without DRD system (4.7.1 – 4.7.5).

4.7.1. Fold the «anti-twist» part of the freebag and the bridle on top of the freebag.	
4.7.2. Fold the bridle in the V-shape leaving 1,5 m unfolded.	
4.7.3. Close the inner upper flap. Make sure that there is no canopy left under this flap.	

4.7.4. Close and pin the right side flap. Use the packing paddle to keep bridle stack in place. Repeat the same with the left side flap.	
4.7.5. Secure the loop with the temporary pin. Make room to the center and work the canopy material towards the upper sides of the container.	

Reserve container closing (continuation)

4.7.6. Fold the rest of the bridle vertically to the grommet level.	

4.7.7.

Insert thread through rod through the pilot chute. Check that the rod goes straight and does not interfere with the mesh or spring coils. Pull the pull up cord through the pilot chute with the rod.

Place the pilot chute spring on top of the sideflaps with grommet accurately in the center.

Pull the pilot chute fabric down towards the main container. Make sure, that the seam of the pilot chute cap binding tape is pointing either towards 1200 hrs or 0600 hrs. This is necessary to hide the seam under the upper or lower flap.

4.7.8.

Compress the spring and secure with the temporary pin.

4.7.9. Turn the pilot chute fabric half round to have it slightly wider than the bottom flap.	
4.7.10. Keepin the pilot chute fabric in place, close the bottom flap. Most of the material should be now under the flap. Secure with the temporary pin.	

4.7.11. After dressing the material even inside the container, push ears of the side flaps into the container. Make sure not to move anything inside.	
4.7.12. Close the upper flap. Insert the pin to the loop and hide it's tip under the pocket at the end of the upper flap. Fasten Velcro tab on RSL\DRD lanyard to Velcro pocket.	
4.7.13. After closing the container stuff the remaining pilot chute fabric under the bottom flap. Be carefull not to move bridle or damage the fabric.	

4.7.14. Seal the reserve container.	
4.7.15. Close the pin cover.	

4.7.16. Switch the AAD on and check that it is operational.	
4.7.17. Mark the repack date on reserve ripcord handle or – if there is a pillow, on the lower cut-away housing.	
Count your tools!!!	

5. Main Parachute Packing Preparations

5.1. 3-ring Release System Installation

3-ring release system is used to attach the main risers to the harness and allow simultanious jettison of the main by pulling a single handle.

The system consists of three rings that fit into each other. The system is closed by a loop that is thread through the upper ring and thereafter through a riser grommet. The loop is locked in place by a yellow cut-away cable.

Each ring is a lever with ratio of 1:10. Thus, three rings reduce the load to 1:100. Therefore the system endures the canopy opening shock. During the opening the force required to keep the lock closed is less than 0,5 kilograms. Keeping the system clean and operational is crucial, because the lightest part of it – white loop (as well as dirt or freeze) may result in jamming of the rings and prevent the main jettison.

It is also important to understand the properties of the nylon material in risers of the system. When nylon stays in the same position for a long time, it begins to conform to that position, which hinders the opening of the system. For that reason it is important to disassemble, inspect and flex the system by bending rings back and forth at least once a month to make them work properly and release even if the force exerted is small (baglock, slider hangup, "candle")

5.1.1. Place the rig facedown as you would pack it. Detect right and left riser (right riser has RSL ring). Place the risers in front of the rig, steering line guide ring showing up.	
5.1.2. Pass the lowest ring of the riser (middle ring of the 3-ring system) through the large harness ring. Fold it back upwards. Thread the smallest ring of the riser (small ring of the 3-ring system) through the middle ring in the same way, but make sure it does not pass through the large ring as well. Bring the white loop over and through the small ring and then through the riser grommet so it protrudes out the back of the riser.	

5.1.5.

Thread the loop through the cable housing grommet. Tha flat side of the grommet should be against the riser.

Lock the loop at it's place by threading the yellow cable through the loop. Make sure the loop is not twisted. Be careful not to bend the cable too much to wrinkle the coating.

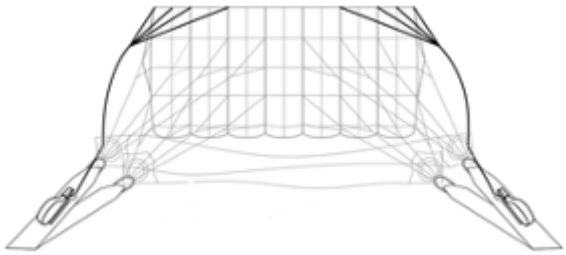
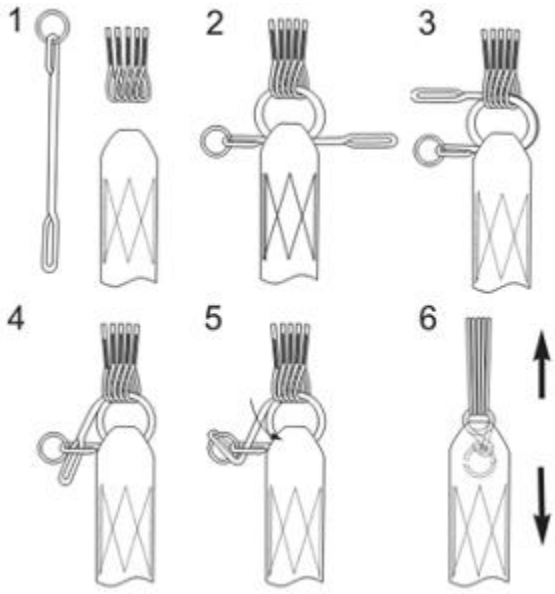
Insert the excess cable into the channel which is on the back of the riser.

Repeat the procedure with the other riser.

Fasten RSL\DRD shackle on the ring on right riser.

NOTE!
Use of «turned» french-style risers is ***stricktly prohibited.***

5.2. Attaching the Main Canopy

5.2.1. Attach the main canopy to the main risers following the canopy manufacturer's instructions.	
5.2.2a. If you use metal connector links - 1. They should be tightened by fingers to the point it stops 2. Tension the barrel 1⁄4 turn with a wrench. Position larger end of the link towards riser, lines to the other end. 3. Install a bumper to protect the link, lines and slider grommet. 4. Secure the bumper by handtacking	
5.2.2b. If you use softlinks – 1. Attach softlinks following the softlink manufacturer instructions. 2. Handtack the ring (tab) to riser to keep it in position	

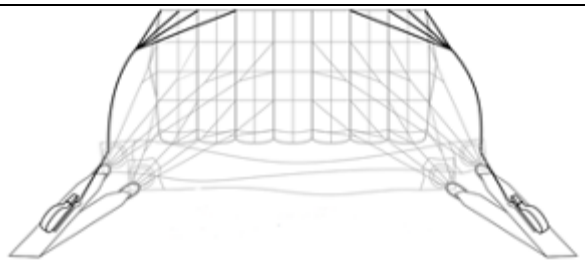
5.3. Attaching the Main Steering Toggles (guiding and flaring toggles).

It is important to follow the canopy owner's manual directions before attaching the toggles to the steering lines. The canopy owner's manual contains important information relevant to that particular make and model of the canopy. The main canopy steering toggles (guiding (outer) and flaring (inner) toggles) are supplied with the Fire Tandem. These steering toggles are compatible with the Fire main risers. It is important to attach the steering toggles at the mark that is located along the steering line. If the toggles are mounted too far down the steering lines, the canopy may be less responsive and if the toggles are mounted too high up, the canopy may suddenly stall on landing.

If your canopy have 2 steering lines – use only guiding (outer) toggles.

If your canopy have 4 steering lines, but they connect to 2 toggles – use only guiding (outer) toggles.

If your canopy have 4 separate steering lines – use guiding AND flaring toggles.

5.3.1 Ensure the steering lines are correctly routed (i.e. they should not wrap around any suspension lines). Check that the steering lines passes through the rear slider grommet and the guide ring on the riser. If your canopy has 4 separate steering lines – guiding (outer) lines and flaring (inner) lines goes throught different rings.	
5.3.2 Locate the marks on the steering lines, that indicates the correct toggle location. Verify that all steering lines are symmetrically marked in the same way. If you find difficult to find the correct location of this mark, refer to the main canopy owner's manual. Make a finger-trap loop to the end of the line to fit the mark on the line. With Microline, tie and adjust an overhand knot to secure the finger-trap. Prefer sewing on Dacron lines, because the knot would be really big on these.	
5.3.4. Thread the end of the steering line through the hole on the toggle. Loop over the end of the toggle and draw tight. Repeat the procedure for the other toggle. Inspect the installation. Check to be sure the steering lines are routed and attached correctly.	

5.4. Measuring And Attaching the Main Container Closing Loops

5.4.1. The main container closing loop is manufactured from Microline 1000 (750) cord. The size of the eye is 1,5 – 2 cm. The length of the loop from top to mark – 3-7 cm. Pick up the loop and a washer. Make a double knot at the mark on the loop. Thread the loop through the washer.	
5.4.2. Pass the loop through the grommets on the bottom flap.	
5.4.3. Adjust the length of the closing loop after packing the main. If the force to extract the pin is less than 2,5 kg the loop must be shortened. Too loose container may lead to pin loosening and premature opening of the main canopy. If you cannot pull the loop through all grommets, the loop should be made longer. After adjusting the length draw the knot tight and thread the loose end into the washer.	

5.5. Attaching the Deployment Bag And the Pilot Chute

5.5.1.

Thread bridle through the canopy attachment loop. Pass the drogue and bag through the looped end of the bridle.

Tighten the knot.

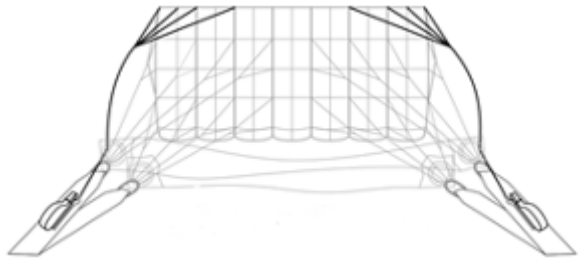
Install rubber bands.
Use only tandem (wide) rubber bands. **Do not use** standard rubber band for sport canopies.

6. Main Packing Instructions

6.1. Setting the brakes

6.1.1.

Inspect that the toggles have been properly attached.



6.1.2.

Pull the steering line(s) until the snake-eye passes through the guide ring.

Set the brake by the riser line loop, then by the toggle, and place the excess line to the outside.

There can be no brake settings (Icarus Tandem), brake setting only for steering toggle (ParAAvis Tandem), or brake setting for both toggles (steering and flaring, like on Aerodyne Tandem).

Check with canopy manual.

If flare toggle has brake setting – pull excess line above guiding ring.

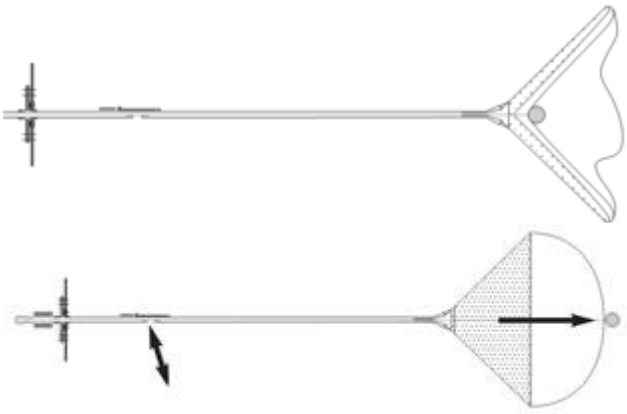
Fasten the snap on steering toggle (red), put lower part of the toggle in pocket.

Insert flaring toggle (black) stiffeners to their appropriate pockets.

Pass the excess steering line through the two elastic loops located on the reverse side of the riser with the toggle assembly.

Set brakes should look as shown in the picture.

6.2. Flaking And Folding the Canopy

6.2.1. Flake the canopy following the canopy manufacturer's instructions. SWS recommends using the Pro Pack-method, because this method produce optimal bulk distribution to the D-bag and container. After flaking the canopy should look as shown in the picture.	
6.2.2. Cock the drogue chute. Check the kill-line verification window, that kill-line has been pulled enough. You must see the marking or black coloured line in the window.	

WARNING.
If you fail to cock the pilot chute, it does not inflate and does not create enough drag to open the main canopy. This may subsequently create a malfunction.
Cock the pilot chute - ALWAYS!!!

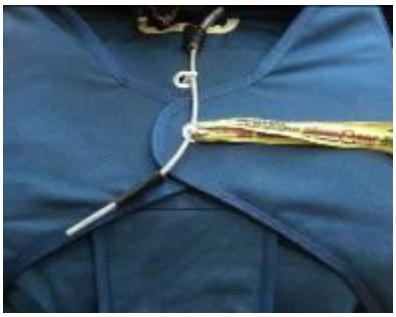
6.3. Placing the Canopy Into the Deployment Bag

6.3.1. Make the first S-fold to match the D-bag length. The trailing edge is to be appr. 5 cm more in than the edge of the S-fold. Control the first S-fold with your knees and make the second fold.	
6.3.2. Slide the D-bag over the canopy keeping lines in the center. Try to fill up the D-bag corners to avoid the bulk gathering to the center. It would make next steps more difficult. Close the D-bag starting with the middle rubber band. Take care that the bands are in good condition. During deployment rubber bands hold the canopy in the D-bag. Go on by closing the flap with corner bands. Cover locking stows by safety flap (small triangle flap) with top rubber band in the middle line of rubberbands.	
6.3.3. Stow the remainder of the lines in the rubber bands (right-middle-left-middle-right and so on) leaving about 50 cm between D-bag and container unstowed – this will help to secure the soft opening of the main. Recheck once more that drogue chute is cocked.	

6.4. Placing the D-bag Into the Main Container

6.4.1. Insert main drogue release into its housing. Prepare drogue 3 ring release for packing.	
6.4.2. Place main bag in the container.	
6.4.3. Place risers side by side along reserve container, rear risers to bottom. This will assure neat and flat packjob. Close the riser cover.	

6.5. Closing the Main Container

6.5.1. Insert flexpin in housing. Take the big ring on the drogue bridle and assemble 3-ring. Main and reserve drogue releases goes throught two different sides of the white locking loop.	
6.5.2. Insert pull-up cord in top loop on the bottom flap, tighten upper flap (pull-up cord goes throught top grommet of the upper flap). Close upper flap by inserting the flexpin. Pass the pull-up cord under the flexpin and extract it, pulling carefully.	
6.5.3. Insert pull-up cord in bottom loop on the bottom flap, tighten upper flap (pull-up cord goes throught bottom grommet of the upper flap). Close left and right flaps, and close the container by inserting the flexpin. Insert flexpin in webbing pocket.	
6.5.4. Tuck the excess bridle under the bottom edge of the right side flap. Close the pin cover.	

6.6. Drogue packing

6.6.1.

Lay the pilot chute out mesh side up.

Fold the pilot chute to the center.

Fold pilot chute again.

Fold the pilot chute in thirds.

S-fold bridle on top as shown.

Make a tight roll. The tighter, the better.

Insert the drogue chute into the pouch, bridle against the container.

Pat the pouch to flatten the pilot chute to fill the pouch. Carelessly into the pouch stuffed pilot chute can be impossible to be pulled out.

7. Using the System

7.1. Pre-jump Equipment Check

Check your gear carefully prior the jump. A number of precedents and skydiving accidents could have been avoided by careful pre-jump equipment check and by repairing found, possibly dangerous defects in time.

To ensure trustworthy check, we recommend that you do it every time in a same sequence –«front: from up to down. Then back: from up to down»

Equipment check, front

AAD	Switched on and in the right mode
3-ring releases	Assembled correctly, loop intact, cut-away cable intact, cable passes through the loop and is inserted to the riser channel.
RSL\DRD (if installed)	Assembled correctly
Chest strap	Webbing and hardware ok, elastic keeper ok.
Housings (cut-away, reserve)	Undamaged, securely attached to the harness
Reserve ripcord and cut-away handle	Properly in their pockets, velcro ok
Size adjusting hardware (if installed)	Tightenet symmetrically
Leg straps	Webbing and hardware ok, elastic keepers ok

Equipment check, back

Reserve container	Container closed correctly, pin in place, luup intact, seal intact, RSL lanyard (if present)correctly installed
Reserve pin cover	Flap is closed correctly and secured
Main risers	Untwisted
Main container	Closed correctly, pin correctly, loop intact, pilot chute cocked.
Main pin cover	Closed correctly
Pilot chute	Packed correctly, handle/hackey attached correctly

NOTE!

It is extremely important to check that reserve repack is valid. This can be checked from a sticker on the reserve ripcord (if the reserve ripcord has a pillow type handle, the sticker is found on cutaway housing on the left side), markings on the paperseal or in the packing data card.

Jumping with a parachute with repack out of date is absolutely forbidden!

7.2. Donning the Parachute

7.2.1. Passenger harness

Adjusting the harness and making sure it fits correctly should be done after the harness is put on and all straps are done.

To adjust the harness use:
- Shoulder and diagonal straps
- Leg straps
- Belly strap
- Chest straps

When the harness is properly adjusted, load carabiners are located on top of the passsenger shoulder line.

Harness should be a close fit in both winter and summer clothing. You should check proper adjustment during "get ready" training with passenger. Attached passenger hangs on the tandem instructor, and margin between snaps and passenger body should be minimal.

7.2.2. Instructor harness

Tandem instructor adjusts his harness by regular means using harness straps. Correct and close fit of the harness will provide comfort load bearing during deployment, and eliminate any chance of injury during deployment.

7.3. Jump procedures.

7.3.1. Attaching of the passenger.

Attaching passenger to the TI Is performed after aircraft boarding in the following order:
- Side carbines are hooked up to the left and right delta-rings accordingly.
- Load carbines are hooked up to the left and right D-ring of the 3-ring system accordingly.

Tandem instructor tightens the passenger by pulling out the side attachment webbings. He can get help for that if necessary from other jumpers. Excess webbing is to be secured by the bands.

7.3.2. Exit.

After "Ready" signal from the pilot, TI and passenger assume a correct pose at the aircraft exit.
1. After exit, stabilize your freefall in a belly to relative wind position.
2. After stabilizing, deploy drogue from BOC pouch with a swift throw to the right.

WARNING:
Deploy drogue in a single motion only!!!
Exit with drogue out of BOC pouch is forbidden!!!
Drogue deployment while unstable or head-down is forbidden!!!

3. Confirm drogue deployment visually.
4. Continue freefall under drogue.
5. Deploy main release at 1400 meters.
6. After stabilizing vertically, do a visual check of the opening canopy. In case of hesitation - pump the brakes.
7. Loosen the side mounts (TI's choice), unhook below 300 meters if necessary.
8. Help the passenger to assume a comfortable pose in the harness.
9. Practice landing procedures with the passenger.
10. Landing pattern is calculated just like on any normal ram-air canopy.
11. Final turn should be at no less than 100 m. to have an opportunity to correct any mistakes that might occur.

7.3.3 Passenger landing procedures.

After TI's command "get ready for landing", passenger should assume a landing position:

- bend his legs in the knees and raise them up, with help of his hands.
- passenger should be aware that TI will land first, and that the passenger shall maintain the landing position until he comes to a complete halt.
- "Prepare for landing" command should be given no higher than 20 to 30 meters so the passenger will not get tired from holding the landing position.

All necessary landing accuracy maneuvers shall be finished no lower than 100 meters.

The tandem should be on a final approach at this time, strictly headwind. Canopy full speed should be engaged no lower than 20 meters. Give the "get ready for landing" command at 20-30 meters. Flare at 3-5 meters to land with minimal horizontal and vertical speed.

WARNING:

1. Under no circumstances should you detach the load carbines until landing!!! Side carbines should be detached no higher than 300 meters!!

2. Landing is the most responsible part of the jump. Flare height depends on weather conditions and passenger weight, and is determined by the TI's skill.

7.4. Tandem Emergencies

Exit Phase (Before Drogue fall)

Bag out immediately on exit:
Deploy drogue, release drogue immediately and expect a malfunction. If cannot deploy drogue, cut-away and deploy reserve.

Unstable on exit:
Try to physically rectify student's position to gain stability, if unsuccessful deploy drogue preferably in a face to earth position.

Side spin:
If left side down deploy drogue. If right side down initiate reserve deployment. It may still be advantageous to deploy drogue even if right side down.

Drogue release handle pulled prior to deployment of drogue:
Immediately deploy drogue.

Unable to locate drogue:
Make second attempt to locate drogue again, check drogue has not prematurely deployed, if not, immediately initiate reserve deployment.

Drogue handle comes off
Drop handle, reach back to drogue pouch, grab fabric and throw as normal.

Drogue fall

Collapsed drogue:
Pull drogue release handle after 6-8 seconds of freefall. Immediately initiate reserve deployment.

Cannot locate (or pull) drogue release handle:
Pull secondary drogue release handle

Cannot locate (or pull) secondary drogue release handle:
Immediately initiate reserve deployment.

Drogue detaches / breaks:
Immediately initiate reserve deployment.

Drogue becomes entangled:
Have one attempt to clear the entanglement, if unsuccessful, immediately initiate reserve deployment.

Main container opens during drogue fall:
Pull drogue release, be prepared for a malfunction.

Left arm incapacitated by injury or by student:
Pull secondary drogue release handle.

Right arm incapacitated by injury or by student:
Pull primary drogue release handle, if cannot find primary drogue release handle, immediately initiate reserve deployment.

Unable to locate either drogue release handle:
Immediately initiate reserve deployment.

Drogue release handle pulled

Main malfunction:
Cut-away and initiate reserve deployment.

Inflated drogue does not release:
Pull secondary drogue release handle.

Inflated drogue in tow:
Immediately initiate reserve deployment.

Drogue deflates but does not release:
Pull secondary drogue release handle.

Deflated drogue in tow:
Immediately initiate reserve deployment.

Drogue detaches / breaks on drogue release pull:
If main does not deploy initiate reserve deployment. If main canopy starts to deploy after reserve deployment, cat-away the main canopy.

8. Maintenance And Storage

8.1. Periodic Inspection

The secret to extending the life of your new harness and container system is performing periodic inspections and maintenance. Usually the Fire requires very little maintenance unless it is subjected to abnormal or harsh conditions. Remember, you entrust your life to the skydiving equipment you have chosen. It is your responsibility to ensure that equipment remains in optimum working order.

The best approach to rig maintenance is to spend a few minutes performing a periodic, detailed inspection of the rig. The inspection should be performed at least once per month. Obviously, the more you use your equipment, the more frequently you should inspect it. If any wear or damage is found, contact your rigger and have it fixed immediately. If you have any suspicions or questions, do not hesitate to call and ask a rigger or the manufacturer for advice.

Periodic inspection should cover all parts of the harness and container system while paying particularly close attention to following areas:

Cut-away system

3-ring releases, housings, handles and handle pockets

Reserve System

Guide ring, closing loop pin ripcord cable and handle, housing, reserve container. You should not attempt any repairs or modifications to any of these items unless you are an appropriate certified rigger. You can, however, identify smaller problems before they become more severe. Some items to look for would include kinks in the reserve ripcord cable, frayed or worn closing loop, frayed stitching on the container.

Harness

The harness should be inspected periodically for broken stitching or frayed webbing.

Main Container

Inspect the plastic stiffeners in the container flaps and have replaced any that are broken. Replace any grommets that are deformed, nicked, damaged, or that are pulling out of their setting.

Main Pilot Chute

Check the centerline (the length of nylon line inside the pilot chute that extends from the handle to the base) of the main pilot chute. It must be firmly sewn at each end; there must be no broken stitches or torn fabric. Inspect the seam that joins the pilot chute mesh to the pilot chute fabric. If the mesh is torn or badly frayed, replace the pilot chute.

Closing Loop

The main container is held closed with a closing loop made of Microline. This loop is subject to wear. If it wears out and breaks, the main canopy may release prematurely and a malfunction may result. Replace the closing loop upon the first sign of wear. A closing loop is a lot less expensive than some of the possible consequences of a premature opening.

Main Risers

Check regularly main riser loop, rings and grommet for damage, wearing or fraying. Check also steering lines, toggles and togglekeepers.

Hook And Loop Fasteners (Velcro)

Check regularly the condition and cleanlines of velcro found on your rig. Clean the hook side, if it has gathered dirt. When you find that your hook and loop fastener is losing its adhesive qualities, have them replaced by a rigger.

8.2. 3-Ring Release System Periodic Maintenance

To ensure proper operation 3-Ring release system requires periodic maintenance and inspection at least once in every 3 months. This is especially important if the rig has not been used for an extended period, such as during the winter. Immediate inspection is required if it has been subjected to some abuse such as being dragged across a runway, a water landing or exposure to a lot of dust or sand.

It's important to maintain the system even more frequently in humid, muddy or freezing conditions.

8.2.1. Every 3 months operate the 3-Ring release system on the ground. Extract the cable completely from the housings and disconnect the risers.

8.2.2. While the system is disassembled, closely inspect it for wear. Check the white locking loops to be sure they are not frayed.

8.2.3. Check the hook and loop fastener on the cutaway handle and main lift web to be sure it is clean and adequately holds the handle.

8.2.4. Check the cable ends for a smooth finish. Check the cable ends and consult a rigger or the manufacturer if a burr or "hook" is present.

8.2.5. Check the stitching, including that which holds the large rings to the harness.

8.2.6. Check that all 3-Ring release housings are firmly clamped.

8.2.7. Take each riser and vigorously twist and flex the webbing near where it passes through each ring. The idea is to remove any set or deformation in the webbing. Do the same thing to the white loop.

8.2.8. Check the housings for dents or other obstructions.

8.2.9. Clean and lubricate the release cable with a silicone spray. Spray on a paper towel and firmly wipe the cable a few times. A thin, invisible film should remain, too much will attract grit and dirt and becomes sticky in low temperatures. That may increase the needed force to make a cut-away.

8.2.10. Inspect the end fittings at the end of each housing. If one of these fittings were to come off the housing, a riser might release prematurely.

8.2.11. If any wear is found, consult the Sky Wide Systems or a rigger before using your Fire.

8.2.12. Reassemble the system. Make sure the risers aren't reversed or twisted.

8.3. Storage

Parachute systems are manufactured primarily from nylon. Nylon is very durable, but is still susceptible to damage from several sources:

Sunlight

The ultraviolet rays in sunlight quickly and permanently weaken nylon. Keep your parachute out of direct sunlight as much as possible.

Acids

Acids damage nylon. Do not spill acid on your parachute. Keep your rig away from hangar floors, close to acid batteries or similar areas where acids may be present. If such contamination does occur, immediately and thoroughly wash the rig with plenty of warm soapy water. Until a rig can be washed, baking soda will quickly neutralize most acids. If acid damage occurs or is suspected, a rigger should thoroughly inspect your rig.

Oils and Grease

Most petroleum compounds do not weaken nylon; they simply stain it. A rigger using the proper petroleum solvent should promptly remove such stains.

Water

Water will not structurally damage nylon, but prolonged agitation in fresh water weakens webbing or may cause some fabric and tape colors to bleed. Salt water may damage nylon, because when drying it creates small salt crystals inside the fibres. If the parachute has been in salty water, it must be promptly and thoroughly washed off with plenty of fresh water. Drying the wet parachute must be done by hanging it to dry outside the straight sunlight in a well ventilated area.

Soil

Soil may damage nylon. Brush off the soil after it has dried and gently wash with warm soapy water. Be sure that the soil is not in the cable housings, 3-Ring release or reserve ripcord pins or loops. Consult a rigger if your rig is heavily soiled or extremely dirty.

Sand

Fine sand will weaken and cut webbing and fabrics of all types. Prolonged exposure to sand will shorten the life of the entire parachute assembly. One way to minimize the damage done by sand is to use a packing mat while packing.

Abrasion

Nylon quickly frays if dragged over concrete or other rough surfaces. Do not drag your rig on the concrete while packing.

9. Customer Care

9.1. Spare Parts

Most of the spare parts are ready to ship on order. If you choose to use non-original spare part, make sure that it is identical to the original in terms of size and standards of manufacture and material. For example: make sure, that you have long enough cables to cut-away handle.

When ordering spare parts you will need the date of manufacture and a serial number. This data can be found inside the main container and reserve risers.

9.2. SWS Company Contact Information

Address: (physical)	Ukraine, Kiev Borispolskaja Street 9 Budmash – factory , building 111, 4th floor, office 404
e-mail:	info@sws.aero
www:	www.sws.aero
President: Tel: ICQ:	Alexey Sharadkin +38-067-404-00-16 # 112688137