Instructions No. P – 011 – 96 for the Packing and Use of the WITTY PLUS Reserve Parachute

(WP-110, WP-130, WP-150, WP-175, WP-210)

Technical Description of the WITTY PLUS Reserve Parachute

11th edition

In Jevíčko, 03/2015

List of Changes

If it becomes necessary to change or extend this manual, the parachute owner will be notified by means of bulletins approved by the Civil Aviation Authority of the Czech Republic. New (corrected) data sheets will be enclosed with those bulletins. The manual owner is obliged to record any notified changes in the List of Changes and to replace outdated data sheets with valid ones. Changed or newly added parts of the text will be marked with a vertical line on the side, and with a change number and the change issue date indicated on the bottom of the page.

Change seq. No.	Chapter	Numbers of sheets to which the change relates	New sheet issue date	No. of bulletin in which the change was published	Bulletin approval date	Execution date Signature

CAUTION!

1. **Proper training and experience are necessary in order to reduce possible risks, the occurrence of serious injuries, or death.**

   Never use this equipment:

   A - If you did not read, or had any problems understanding this caution tag, and if you have not completed a training program prescribed for the use of this equipment.

   OR

   B – If you did not read, or had any problems understanding, all of the flying manuals and packing instructions, and have not completed at least 100 parachute jumps;

2. **In order to reduce the risk of death, serious injury, and damage or destruction of the parachute canopy, it is recommended not to exceed the load limits and velocity at the point of the parachute's opening (see the technical and tactical parameters shown in Table No. 1).**

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SECTION I

Technical description of the WITTY PLUS reserve parachute (hereinafter referred to as WP and a number indicating its size in square feet WP-110, WP-130, WP-150, WP-175, WP-210)

1. Designation

1.1. The WITTY PLUS parachute canopy (WP-110, WP-130, WP-150, WP-175, WP-210) is designed for use as a reserve parachute in tandem-arranged packaging.

The parachute canopy can also be used as the main parachute, in which case it MUST NOT be reused as a reserve parachute.

2. Tactic-technical parameters

2.1. Basic parameters

Reserve parachute type	***Surface [sq. ft.]***	***Maximum parachute canopy load [lb/kg]***	***Parachute canopy weight [lb/kg]***	***Volume [cm^3/cu.in]***	***Max. velocity at parachute opening [$km.h^{-1}$]***
WP-110	112	190/86	4.6/2.1	4070/248	278
WP-130	132	220/100	5.2/2.3	4810/293	278
WP-150	150	255/116	5.6/2.5	5550/339	278
WP-175	175	255/116	6.45/2.9	6290/384	278
WP-210	210	277/126	7.81/3.5	7770/474	278

Table No. 1

Parachutes complied successfully with rigidity drops at a range set according to TSO C23d.

3. Manufacturing

This parachute is made in a unified form. Upon request, the following modifications can be provided:

- Different color finish.

4. Warranty Period

The warranty period runs for 24 months, beginning on the date of dispatch.

The manufacturer will not honor any complaints in the event that:

- the user has violated parachute packing, storage, and/or maintenance conditions.
- the parachute was damaged by becoming caught in gearing or other static equipment parts.
- the parachute is not submitted along with the parachute's log book, or if that log book is not completed correctly.

5. Time Life

The total time life of the parachute is set to 20 years since the production date in maximum. However, it depends on the technical condition of each parachute. Therefore it is required to meet the following conditions:
a) Replace damaged parts in time and without any delay. Any replacement of parts must be recorded in the parachute log book.
b) Repair the parachute and its parts in time and without any delay, always according to technical conditions of repairs. Each and every repair must be recorded in the parachute log book.
c) After the elapse of 5 years carry out overall technical inspections (validity - 2 years inmaximum, result to be recorded in the parachute log book) till its unworthiness for jumps.

6. Operational Conditions

The functions of the parachute are guaranteed at an atmospheric temperature ranging from –40 °C to + 93,7 °C, and at a humidity level corresponding with those temperatures.

7. Packaging Duration

Before use, the parachute may be packed for a maximally period of 365 days.

If national regulations require a shorter repacking period, such regulations are applied.

8. Parachute Usability

This parachute is designed for applications in parachute sets, specifically as a emergency parachute in a tandem arrangement. The parachute is connected to a harness with mailon-type screwing clips. To allow for the connection of a emergency parachute, the carrying harness must have four free ends, the rear free ends being ended with carriers for control loops.

Using the screwing clips or soft links SFL, connect the parachute to the free ends of the carrying harness, lead the guiding lines through metal rings on the rear free ends, and attach control loops

Attach a pilot parachute to the end of the connecting trimming line, which is one of parachute canopy components.

A emergency parachute can be integrated in a parachute set only by a person with necessary qualification, or by the manufacturer's employee.

The use of a standby parachute with different packing components from another manufacturer is conditional upon an approval from the parachute manufacturer, MarS.

9. Parachute Functions

The emergency parachute is used in the event of a defect occurring on the main parachute.

When a defect is found on the main parachute's canopy, the main parachute must be discarded before using a emergency parachute.

The parachutist activates the parachute by pulling out the standby parachute releaser from the flexible tube, which extracts the parachute packaging. Subsequently, the parachute packaging flaps become released, the pilot parachute springs up into the airflow, and pulls out the canopy bag from the packaging. Lines in the storage compartment on the parachute canopy bag become undone and the parachute canopy moves out of the bag. The parachute canopy begins to inflate and at the moment that the slider declines to the free ends the parachute canopy is in fully functional condition. Afterwards, release the parachute brake by pulling out the controlling loops and then fully concentrate on parachute maneuvering.

10. Parachute Set

The parachute comprises the following main components.

10.1. Reserve pilot chute	1 piece
10.2. Free bag	1 piece
(for instance VV-051, VV-050, VV-075 etc.)	
10.3. Parachute canopy with lines	1 piece
10.4. Screwing clips	4 pieces
or	
10.5. Soft links SFL (with a strap)	4 pieces
10.6. Braking canvas (slider)	1 piece
10.7. Control loops	2 pieces
(for instance RP – 006 or RP – 007)	

11. Technical Description of the Parachute

11.1. Reserve pilot chute

The pilot chute secures the opening of the reserve container and pulling the free bag (with a stowed reserve parachute canopy) out of the reserve parachute container.
It is made of PAD fabric and net. The bottom is reinforced with duralumin sheet.
The PV-028 chute is equipped with a coiled spring with the minimal ejection strength of 100 N.
The PV-055 chute is equipped with a coiled spring with the minimal ejection strength of 180 N.

11.2. Free bag

Is designed for stowing a packed canopy of the reserve parachute into the reserve parachute container. It is made of PAD fabric. A bushing is pressed-on in the middle of the container for leading the closing line of the reserve parachute. A loop for the attachment of the pilot chute is sewn on the other end of the webbing.

11.3. Parachute canopy with lines

Is made of nylon material with 0-31 permeability.The parachute canopy has 7 channels, each of which consists of cells. The force developed by line loops is distributed to the parachute canopy by means of hemming lines that are 13 and 20 mm wide. Other strained parts of the parachute canopy are reinforced with hemming lines that are 13 mm wide. The trailing edge is reinforced with a hemming line that is 15 mm wide. At its free ends, the parachute canopy is tied up into two lines of load-carrying lines that split at the parachute canopy.

11.4. Screwing buckles

Four screwing buckles are attached at the end of supporting lines and are used to connect the parachute canopy and the supporting harness. The guaranteed strength of these buckles is at least 3.5 kN.

Tightening screw clamps – information for users:
When attaching the screw clamp, first, you have to screw the nut of the screw clamp by hand until it stops, and then to screw it with a spanner by $^{1/4}$ revolution (90^{o}).

Warning: You have to tighten the screw clamp carefully in order not to rip the nut.

11.5. Soft links SFL (with a strap)

Connection of suspension lines of the reserve parachute to the risers of the carrying harness is possible with the help of 4 pieces of rapid links or with the help of 4 pieces of soft links (with strap).
Soft link SFL is made of Microline line of the minimal strength of 1300lb. To one end of the line there is a strap sewn, while the inserted line that goes through the strap loop forms a loop.
The other end of soft ling forms a loop that secures the connection after mounting when threaded over the strap.

11.6. Braking canvas (slider)

Is made of nylon and its periphery is reinforced with a 43 mm wide hemming tape. All of its four corners are applied with pressed brass bushings No. 8 (made in the USA).
Reserve parachutes WP-150, WP-175 and WP-210 has the slide crosswise strengthened with the tape of the width of 78 mm.

11.7. Control loops

These loops, to which control lines are attached, control the parachute. Control loops RP – 006 or RP – 007 are made of a 25 mm wide strap. Their reinforced part, which is to be stuck into the control string, is fitted with a No. 0 pressed brass bushing into which the control string is introduced.

Connection of suspension lines of the reserve parachute to the risers of the carrying harness with the help of softlinks (with a strap)

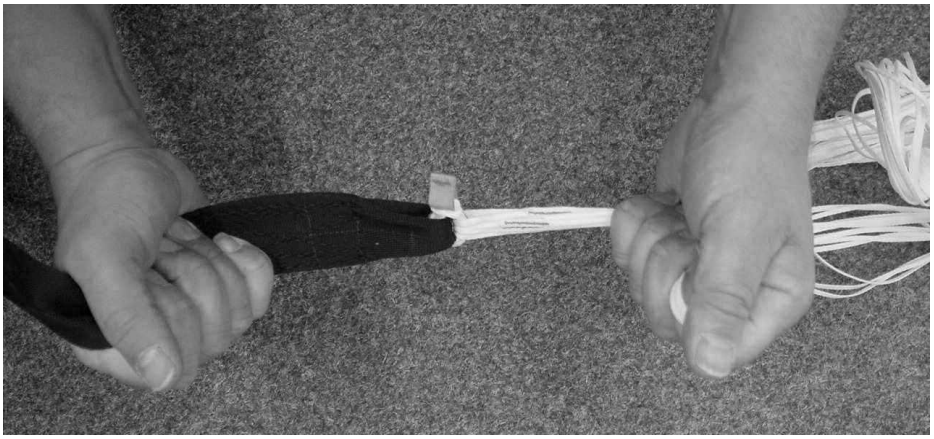
Thread the free loop of the „softlink“ through the loops on the ends of suspension lines of the reserve canopy and through the loops made on the risers of the carrying harness that are designed for connection of the reserve parachute.

Once again thread the free loop of the “soft link” through the loops of the suspension lines and through the riser of the carrying harness. Tighten the connection well.

Thread the free ending loop of the “soft link” through the loop formed with the inserted line of soflink that is going through the strap on the other end of “softlink”.

Thread through the free ending loop the other end of the “softlink” with a strap, and tighten the connection so that the connection is firm enough.

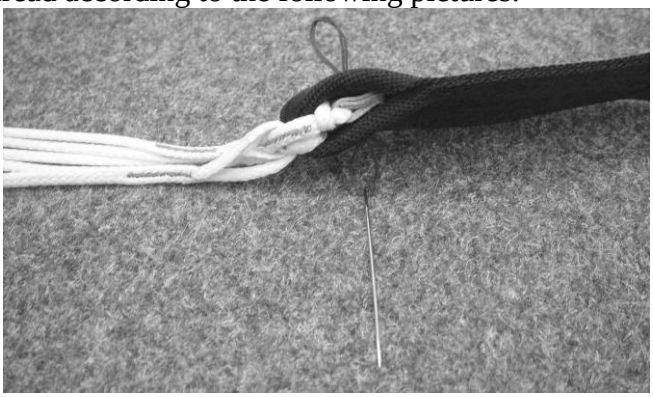
Tighten this connection by pulling the suspension lines of the reserve parachute and the risers of the carrying harness.

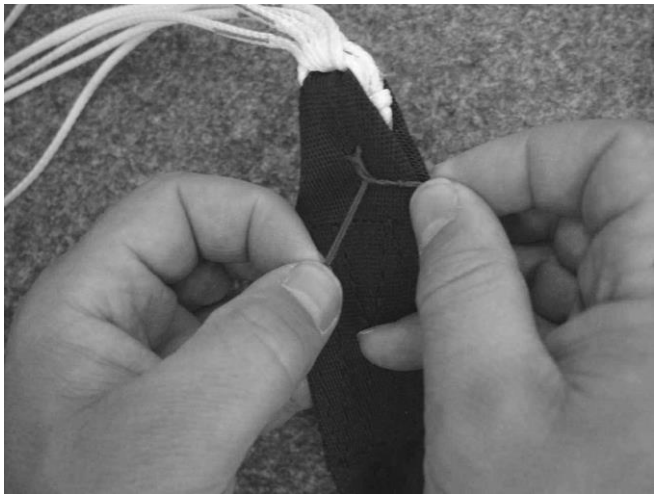


Turn this connection so that the connection of both its ends with a strap is inserted in the loop of the riser of the carrying harness.

Make sure once more that the connection mounting is secure by pulling the suspension lines and risers.

Finally carry out securing of the connection position with two stitches made with the red thread according to the following pictures:





<u>Warning:</u>

It is necessary to carry out a check before every use, if the connection of softlink is not damaged.

SECTION II.

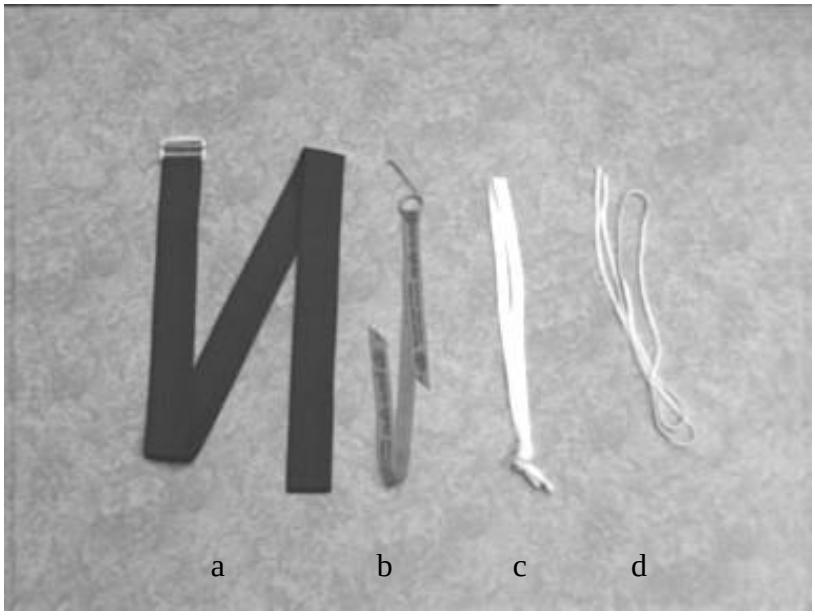
Packing Instructions

The parachute canopy is packed by an authorized person (packer) who confirms his proper packing by making an entry in the parachute log book.

1. The following aids are used for parachute packing:

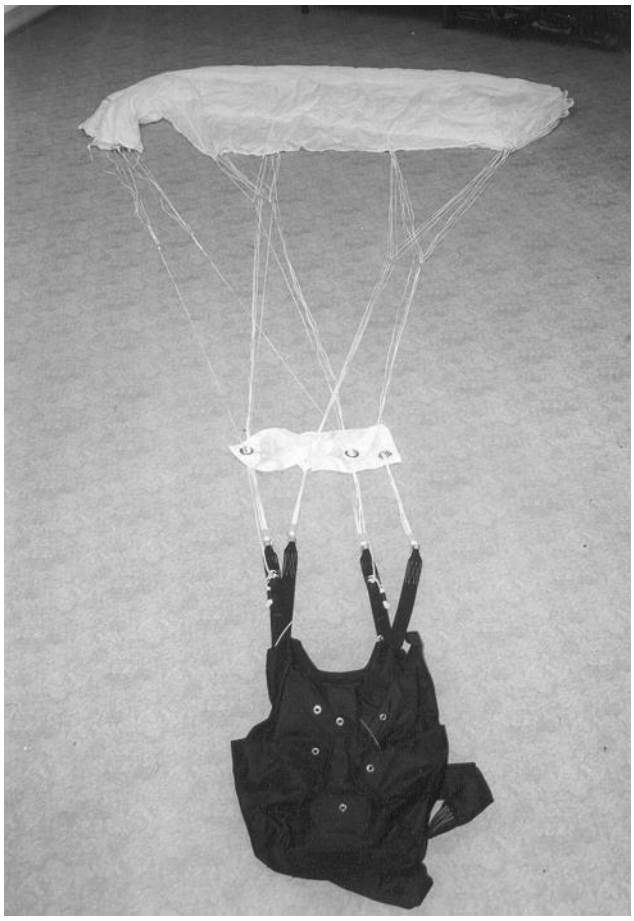
   a) Auxiliary packing strap (with a buckle)
   b) Auxiliary needle with a hemming line
   c) Container expansion limiting string
   d) Packing line

All of these aids are manufactured in contrasting colors.



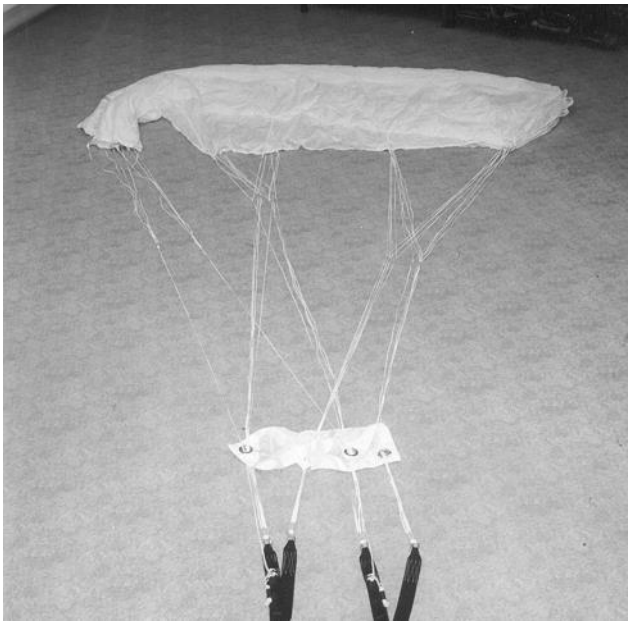
Picture 1

2. The supporting harness is to be attached to the edge of the packing board and the parachute canopy is then to be unfurled over the surface of the board, as shown in picture No. 2. If the lines are entangled, undo them first. Move the slider to the free ends. Check all of the important parachute canopy components. When the check is complete, insert the rope with the needle into the flexible hose on the harness side and introduce the handle into the reserve parachute releaser pocket.



Picture 2

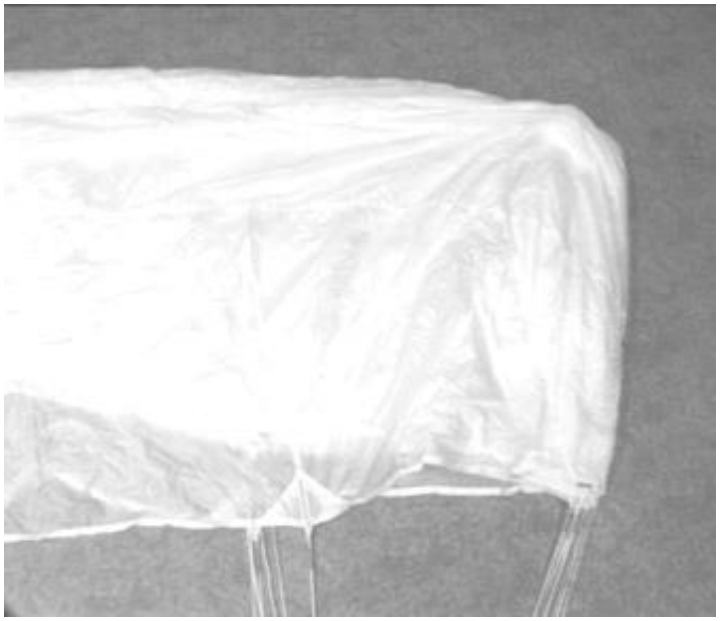
3. Straighten the individual fields so that the supporting lines are tight. Then straighten and smoothen the front and rear parts of the parachute canopy. The individual groups of the supporting lines must remain taut during the entire packing procedure.



Picture 3

4. Use the packing line to tie together the screwing buckles on the straps of the reserve parachute. As a result, the lines will be evenly tight during packing.

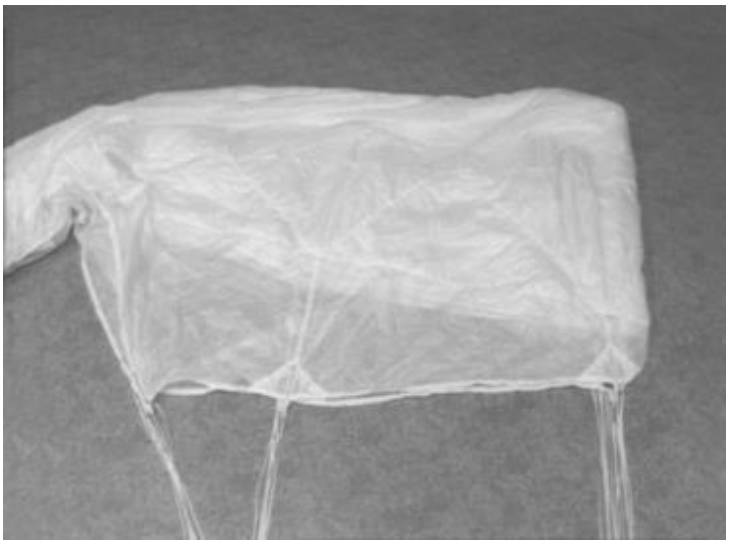
Picture 4



5. Fold the front parachute canopy part (reading edge) underneath and straighten it carefully.

Picture 5

6. The parachute canopy is packed by means of S folds so that the bundle of lines on each other in the center.



Picture 6

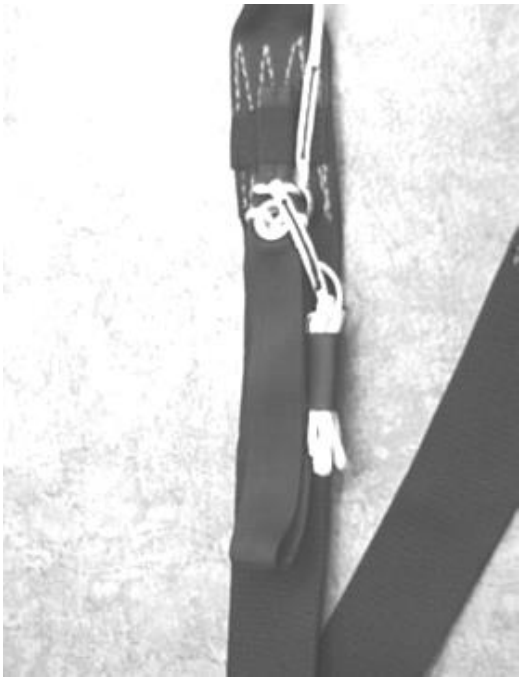
7. Continue to pack the parachute canopy until the fourth row of lines.

Picture 7

8. Pull out and fold side stabilizers on each side.

Picture 8

9. Brake the parachute canopy, straighten the control lines under a Velcro tape to which you then attach the control loop on a Velcro tape.



Picture 9

10. Divide the channels on the drainage edge to the left and to the right, depending on the control lines. Properly arranged supporting lines of the parachute canopy lie in the center.

    Place the trailing edge of the parachute canopy on the straightened parachute canopy and support the edges that overhang the width of the straightened parachute canopy. The control lines must be taut and straightened.

Picture 10

11. Pull the slider behind the central point, right next to the stops, and straighten it. Straighten the lines as well.

Picture 11

12. Move the trailing edge over to the slider bushings and fold its sides underneath.

Picture 12

13. Fold the bottom part of the parachute canopy into an ‘S’-shape and place the auxiliary packing line underneath.

Picture 13

14. Then divide the upper part of the parachute canopy in two symmetric halves, thus obtaining a ‘V’ shape.

Picture 14

15. Using the auxiliary strap, tighten the divided parachute canopy so that the buckle and the loose ends face the lines.

Picture 15

16. Prepare the container that must be protected against expanding by securing its middle parts with a stronger hemming line or string on which you need to make a knot with a loop.

    Fold some sections of the connecting hemming line of the container and the pilot parachute to secure the container's elastic eye.

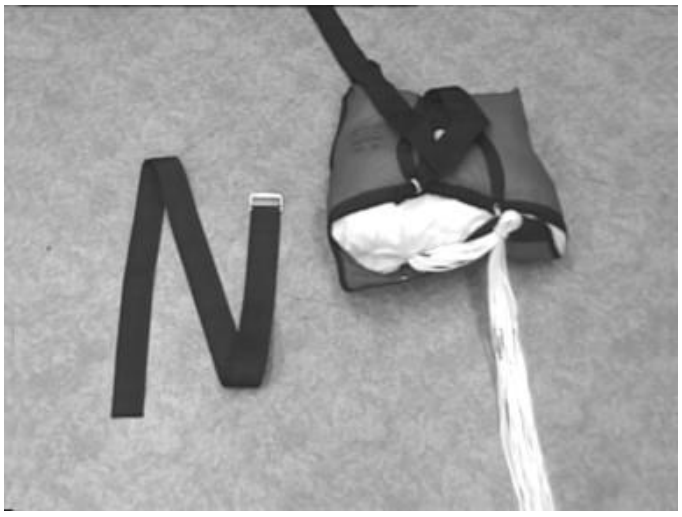
Picture 16

17. Carefully insert the compressed parachute canopy (start with its divided part) into the container. The container's elastic eyes are secured with the

connecting hemming strap.

Picture 17

18. Arrange and smooth the parachute canopy inside the container. **Then release and pull out the auxiliary packing strap**. Close the container with the flap and secure it with the bundle of lines.



Picture 18

19. Close the container with the other half of the flap as well.

Picture 19

20. The remaining support lines of the parachute canopy are stored in a pocket on the rear side of the container. The pocket is then secured with Velcro tape.

Picture 20

21. Untie the packing line and the screwing buckles on the backup parachute straps. Introduce the packing string in the closing eye of the packaging on the harness and lead it to the eye of the hemming line that had prevented the middle container section from expansion.

Picture 21

22. The placement of the container with a reserve parachute canopy is discussed in the description of wrapping part packing.

SECTION III

Instructions for the use of the parachute

1. Preparation of the parachute before a jump

Before a jump, the parachutist is required to check the following: the placement of the needle of the rope releaser in the closing string's eye, the placement of the releaser handle, the intact condition of the seal thread, and the parachute packing date. The releaser rope must be free for passage in both the flexible hose and the opening of the steel handle to prevent the unwanted opening of the backup parachute.

2. Parachute opening

The Reserve parachute is used in the event of a defect occurring on the main parachute.

When a defect is found on the main parachute's canopy, the main parachute must be discarded before using the emergency parachute.

The parachutist activates the parachute by pulling out the releaser located, in most parachute sets, on the left side of the supporting harness. Pulling the releaser out of the flexible tube will pull out the needle from the eye of the parachute's sealing packaging. Subsequently, the parachute packaging flaps are released, the pilot parachute lines up into the airflow and pulls out the canopy bag from the packaging. The parachute canopy begins to inflate and at the moment that the slider descends to the free ends the parachute canopy is in a fully functional condition. Afterwards, release the parachute brake by pulling out the controlling loops, and then fully concentrate on parachute maneuvering. When a defect is found on the main parachute canopy, the main parachute must be discarded and the emergency parachute must be used instead.

SECTION IV

Instructions for the storage and transportation of the parachute

1. Storage conditions

The parachutes must be stored on shelves with surfaces that are smooth and clean, without corrosive products. The parachute must be a minimum distance of 0.5m from walls and at least 1m from heaters.

If the parachute is stored for a longer period, it must be aired out at least once every 6 months for a minimum of 24 hours. While being aired out, the parachute must not be subjected to direct sunlight. Regular airings are recorded in the record log.

It is forbidden to store acids, oils, paint thinners or other aggressive substances together with parachutes. The following climatic conditions must be observed in areas were parachutes are stored:

- Day temperature + 14 to + 25^{o} C
- Day relative humidity 35 to 70%

The storage of metal objects not belonging to the parachute rigs or other parachutes (this excludes metal shelving for parachute storage and metal objects designated for ensuring storage operations), oils, acids and substances releasing active gases are not permitted in rooms where parachutes are stored. Smoking is prohibited in this area.

Parachutes are stored unpacked. Packed parachutes can be stored for up to 365 days from packing.

2. Transportation of parachutes

Under the conditions of their active use, parachutes are transported in portable bags.

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