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

(WP-110, WP-130, WP-150, WP-175, WP-210, WP-260)

Technical Description of the WITTY PLUS Emergency Parachute

(WP-110, WP-130, WP-150, WP-175, WP-210, WP-260)

(9th edition)

In Jevíčko, 09/2009

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 The manual owner is obliged to record any notified changes in the List of Changes and to replace outdated data sheets with valid ones.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).**

MarS a.s.

Okružní II. čp. 239

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SECTION I

Technical description of the WITTY PLUS emergency 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, WP-260)

1. Designation

1.1. The WITTY PLUS parachute canopy (WP-110, WP-130, WP-150, WP-175, WP-210, WP-260) 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	220/100	5.6/2.5	5550/339	278
WP-175	175	220/100	6.45/2.9	6290/384	278
WP-210	210	253/115	7.81/3.5	7770/474	278
WP-260	260	308/140	9,21/4,2	9250/564	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
- Different container dimensions

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. Service Life

The total service life of the parachute is set to 15 years since the production date in maximum. The user is nevertheless required to secure the following:

- condition monitoring of parachutes in the productive running
- consequent control of all parachute components by a packer with every repacking of the parachute
- early exchange or reparation of worn-out components

The owner is obliged to carefully preview the parachute after every real using and check, if there is not any damage of some components.

The canopy is to be equipped with the WARNING label. By removing this label, the user loses (breaks) all warranties given by the manufacturer.

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, 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 a.s. Jevíčko, or from the Testing Laboratory of AeČR (AERO CLUB OF CZECH REPUBLIC).

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. Parachute canopy pilot parachute (for instance PV – 028, PV – 038 etc.)	1 piece
10.2. Parachute canopy bag (for instance VV – 051 or VV – 050 etc.)	1 piece
10.3. Parachute canopy with lines	1 piece
10.4. Screwing clips	4 pieces
10.5. Braking canvas (slider)	1 piece
10.6. Control loops (for instance ŘP – 006 or ŘP – 007)	2 pieces

11. Technical Description of the Parachute

11.1. Pilot parachute

The function of the pilot parachute is to pull out the parachute canopy with lines from the packing.
It is necessary to use a pilot parachute with a spring force greater than 100 N!!
We recommend using pilot parachutes No. PV – 028, PV – 038 etc.

11.2. Parachute canopy bag

The parachute canopy bag is used for the storage of a folded parachute canopy and lines. The upper part of the parachute canopy bag is stitched with a connecting hemming line that provides the connection of the parachute canopy bag and the pilot parachute. The parachute canopy bag is made of nylon material and reinforced with hemming lines that are 20,25 and 43 mm wide. The connecting hemming line is 5 m long and 50 mm wide. The connecting hemming line makes sure that the parachute canopy bag is pulled out even in the event that the pilot parachute fails or becomes jammed (for instance VV – 051 or VV – 050 etc.)

11.3. Parachute canopy with lines

The parachute canopy 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. Braking canvas (slider)

The rectangular 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).

11.6. Control loops

These loops, to which control lines are attached, control the parachute. Control loops ŘP – 006 or ŘP – 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.

SECTION II.

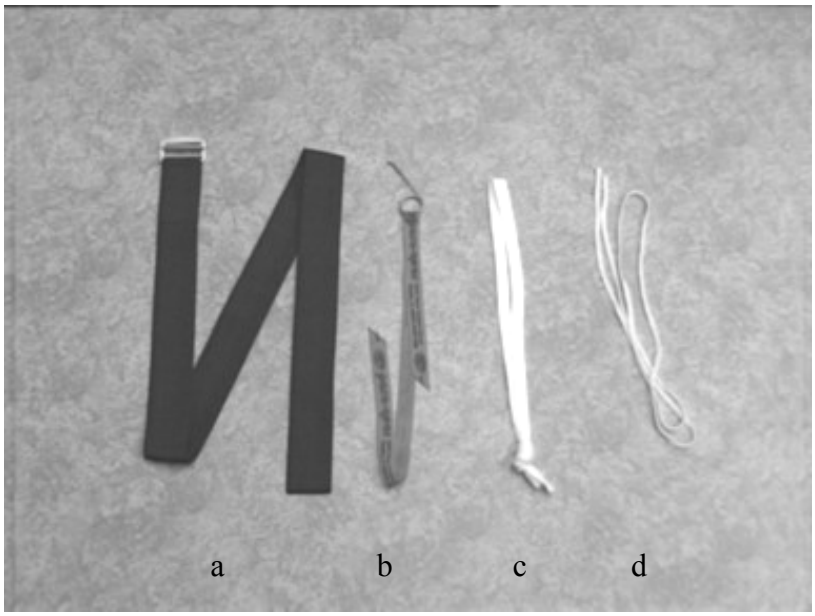
Packing Instructions

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:

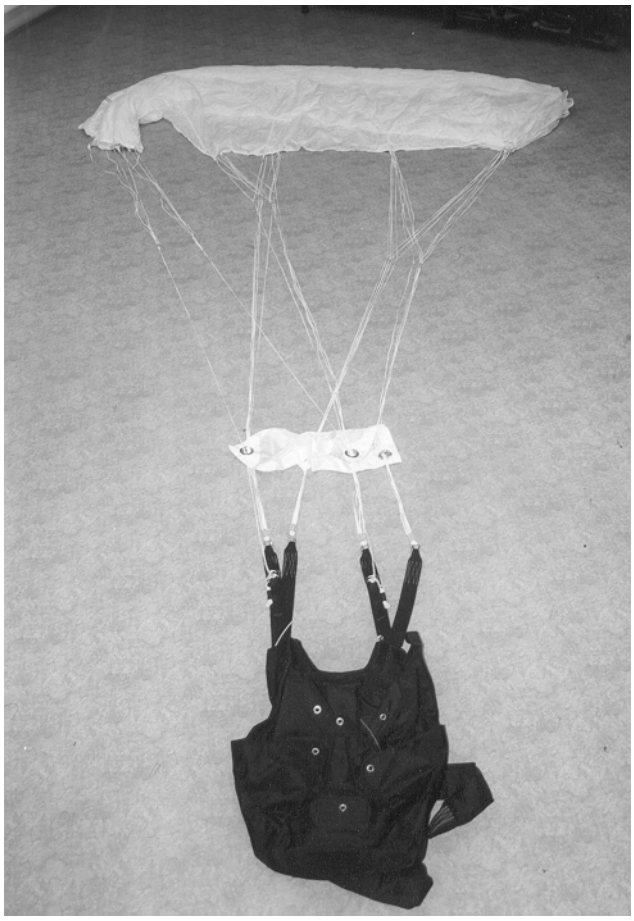
   a) Auxiliary packing strap (with a buckle)
   b) Auxiliary needle with a hemming line
   c) Container expansion limiting string
   d) Packing line

All of these aids are manufactured in contrasting colors.



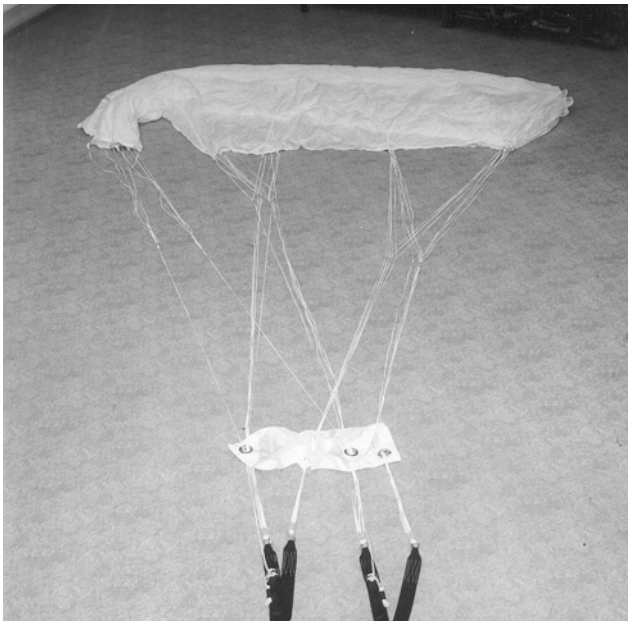
Picture 1

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

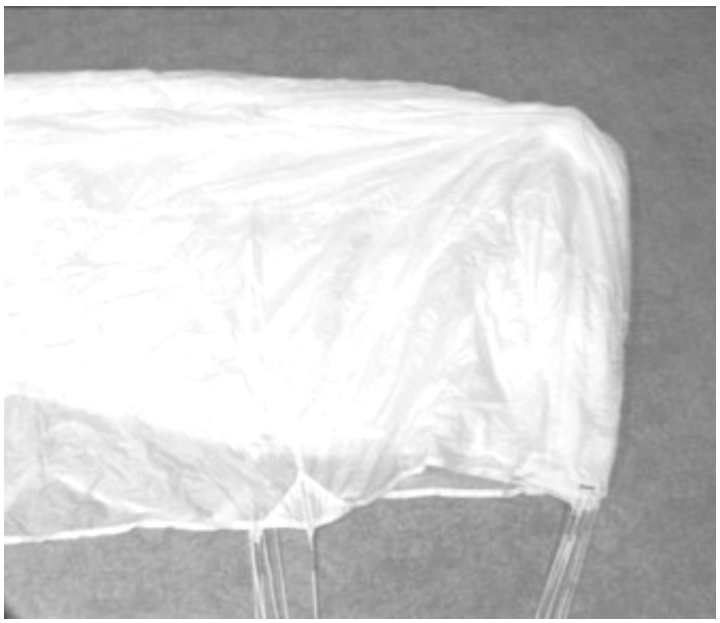
3. Straighten the individual fields so that the supporting lines are tight. Then straighten and smoothen the front and rear parts of the parachute canopy. The individual groups of the supporting lines must remain taut during the entire packing procedure.



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.

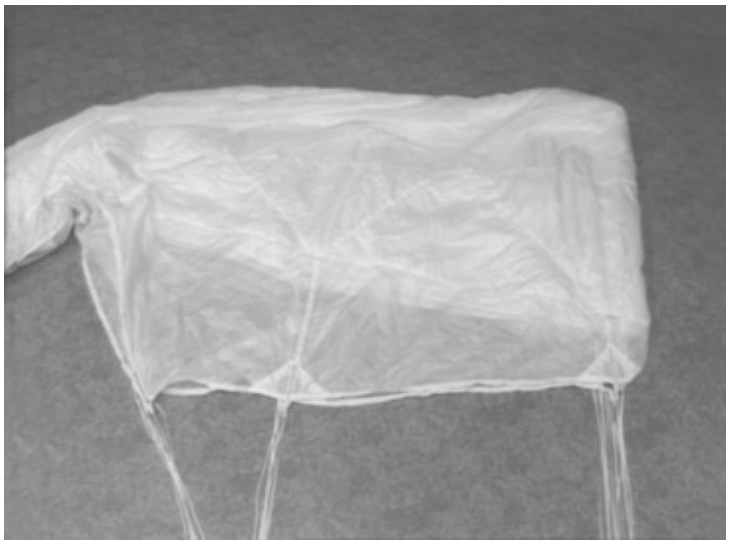
Picture 4



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

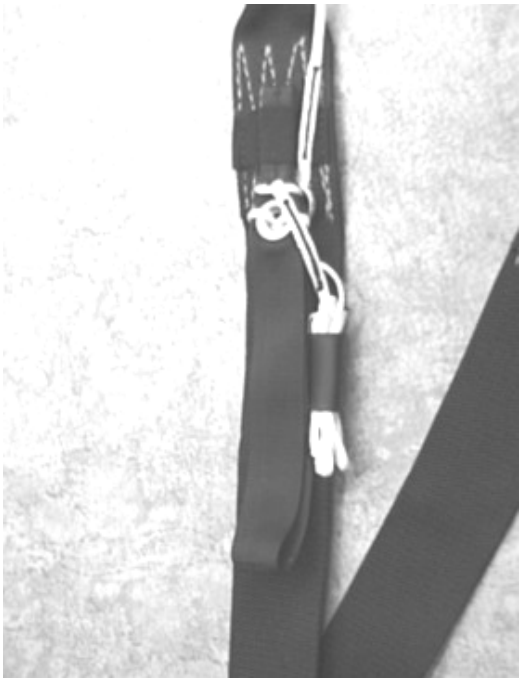
7. Continue to pack the parachute canopy until the fourth row of lines.

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.

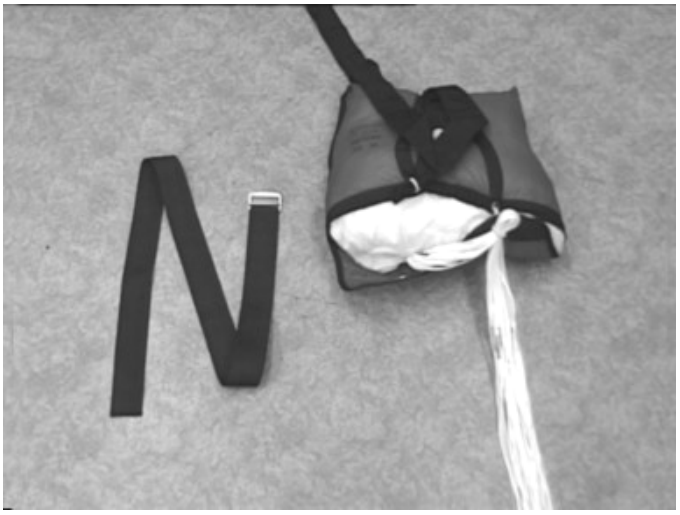
    Fold some sections of the connecting hemming line of the container and the pilot parachute to secure the container's elastic eye.

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 (for instance, P-001-01).

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 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 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

Parachutes are to be stored on racks in a dry, dark, and well-ventilated room. The bottom rack must be at least 0.15 m from the floor, and racks must stand at least 0.5 m from walls and at least 1 m from heating radiators. If a parachute is stored for a longer period, it must be properly ventilated minimally for 24 hours at least once in six months. During ventilation, the parachute must be protected from exposure to the sun. Ventilation must be recorded in the parachute log book.

It is forbidden to store parachutes in the same room with acids, oils, solvents, and other chemically aggressive substances. A parachute storage room must comply with the following climatic conditions:

- Relative humidity: 35 % to 70 %

Parachutes are stored unpacked. Packed parachutes can be stored for no more than 365 days from its packing day.

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

2. Transportation of parachutes

Under the conditions of their active use, parachutes are transported in portable bags carried by airplanes or in covered cars (cars with a canvas cover or vans). In other cases, parachutes are transported unpacked in portable bags and laid in cartons, crates, transport cases, or containers. The inside surface of transportation packaging must be smooth and clean.
The walls of transport cases and crates must be covered with wrapping paper.