Handbook

for

Troop Parachute

RS-4/4 T

NSN: 1670-12-363-4117
Part No. 50-214/07:00,
Part No. 50-214/09:00

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List of Contents

1. Intended use and technical details

1.1. Intended use

The RS-4/4 T parachute is a steerable Troop Parachute for automatically opening which can be used for general training of parachutists and for armed forces operations.

1.2. Technical details

Parachute canopy area	approx. 74 m²
Number of gores and suspension lines	30
Length of each suspension line from base to D-ring	7 m
Dimensions of the packed parachute	540 x 310 x 180 mm
Weight of the packed parachute	approx.13 kg
Payload	50 – 150 kg / 108-325 lbs.
Maximum overload during the opening	5 – 6 g
Dropping out speed	100 – 250 km/h / 54-135 KIAS
Minimum jump altitude	150 m / 500 ft (aeroplane)* 250 m / 800 ft (helicopter)*
Rate of descent close to ground with 130 kg working load	4.0 m/s
Turn velocity	6-8 s / 360°
Storage time in packed condition	180 days
Service life time period	15 years (recommended)

* *see also para 5.1*

1.3. Component parts of the RS-4/4 T Troop Parachute

Designation	Quantity	Item number
Canopy	1ea	50-34/07:00
Deployment bag with static line	1ea	50-508/04:00
Riser	1pair	50-307/04:00
Harness RS 2000	1ea	50-755/01:00
Pack tray	1ea	50-754/01:00
Carrying bag	1ea	50-513/04:00

2. Description of the parachute

2.1. Parachute canopy with rigging lines (Fig.1a, 1b)

The parachute canopy has a special form and special arrangement of fabric with varying air permeability, which results in the excellent aerodynamic characteristics.
It consists of 30 gores and has 30 rigging lines that run from the Connector Links to the base of the parachute canopy and from there to a second fixing point. The piece of linen running along the inside of the parachute canopy is shorter than the corresponding fabric sheet and this results in a bead in unfolded condition – the leading surface.
Every gore is manufactured by 8 parallel cutted fields of different length. To assist the unfolding of the parachute canopy an air pocket is affixed to the base of every second gore.
15 top lines run over the top opening. These are loosely gathered in their middle with an top loop (packing aid loop).
There is a steering note on each of the gores 7 and 9 and 23 and 25, each with 2 sub-steering lines. Steering the canopy is possible by using the left and right steering line, which are splitted into branch lines and further into sub-steering lines
The base edge is fitted with a basic net.
The device label is located on gore 1, field 1.

Fig. 1-a

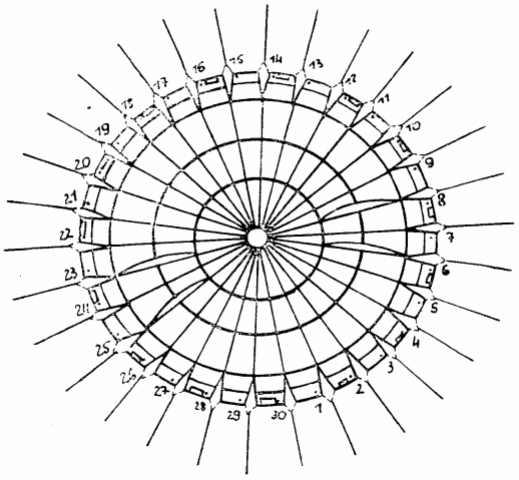


Fig.1-b

2.2. Deployment bag with static line (Fig.2)

The pack tray is made of COTTON fabric, and its dimensions in packed condition are approx. 450x300x100mm. In the pack tray inside (short small side) an inner webbing loop is fixed with the static line, which is also fixed with the outer webbing loop. The free end of the loop is used for shear connection with the top loop of the canopy.
On the upper side of the container there are two rigging line loop seams which are sewn diagonally on the backing.

1 Static line with hook, soft pin and static line sleeve

2 Deployment bag

3 Closing flap

4 Protection flap for suspension lines

Fig: 2

The open side is fitted with a closing flap. This enables the closing of the pack tray (window bolt closure). Protective flaps are sewn onto both sides and the upper short side.
The upper section of the static line is covered with a cotton protective sleeve. The sewn-on loop with its affixed coupling pin is used to close the container when packing. A snap hook is sewn onto the end of the approx. 15 ft. long static line.

2.3. Pack tray

The Pack tray has an oblong base shape with four closing flaps that form the loop-grommet closure.
The container is fixed to the harness by back strap retainer/keeper that are sewn onto the outside of the base of the container and are closed with press-studs. The pocket for the parachute control book and the waist band/waist band adjuster panel for fixing the reserve parachute are also sewn onto the outside base.
There are two retaining loops with rubber rings on the upper closing flap into which the static line is looped.
On the left closing flap there is a pocket for holding the static line snap hook.

1 Flap 1

2 Flap 2

3 Flap 3

4 Flap 4

5 Waist band

6 Waist band adjuster panel

7 Log record stow pocket

8 Static line snap hook stow pocket

9 Diagonal back strap retainer/keeper

10 Horizontal back strap retainer/keeper

11 Running loop

12 Rubbers for stowing suspension line

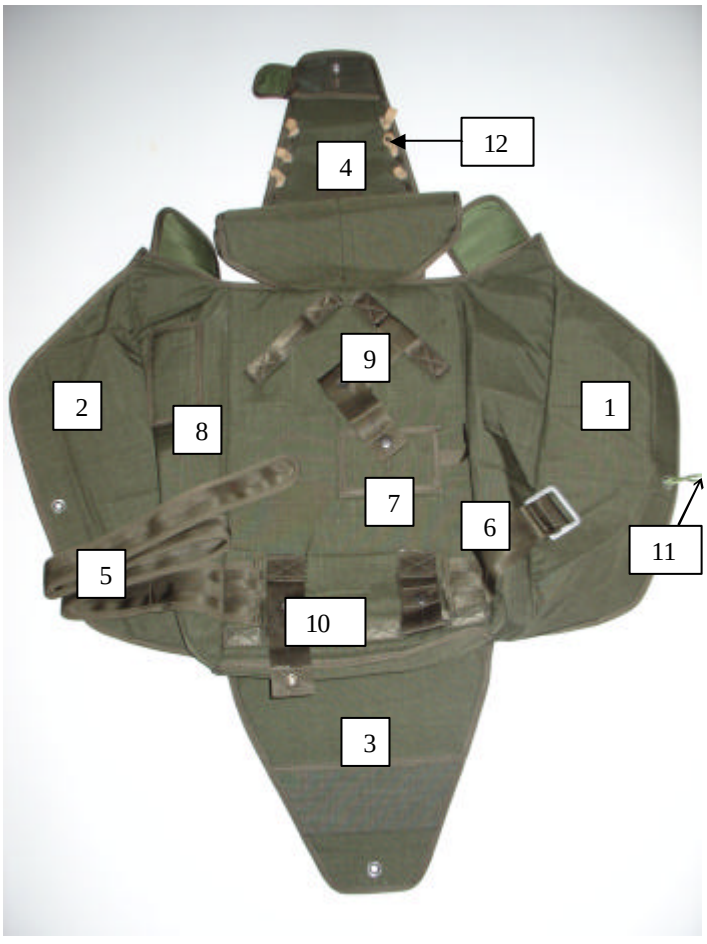
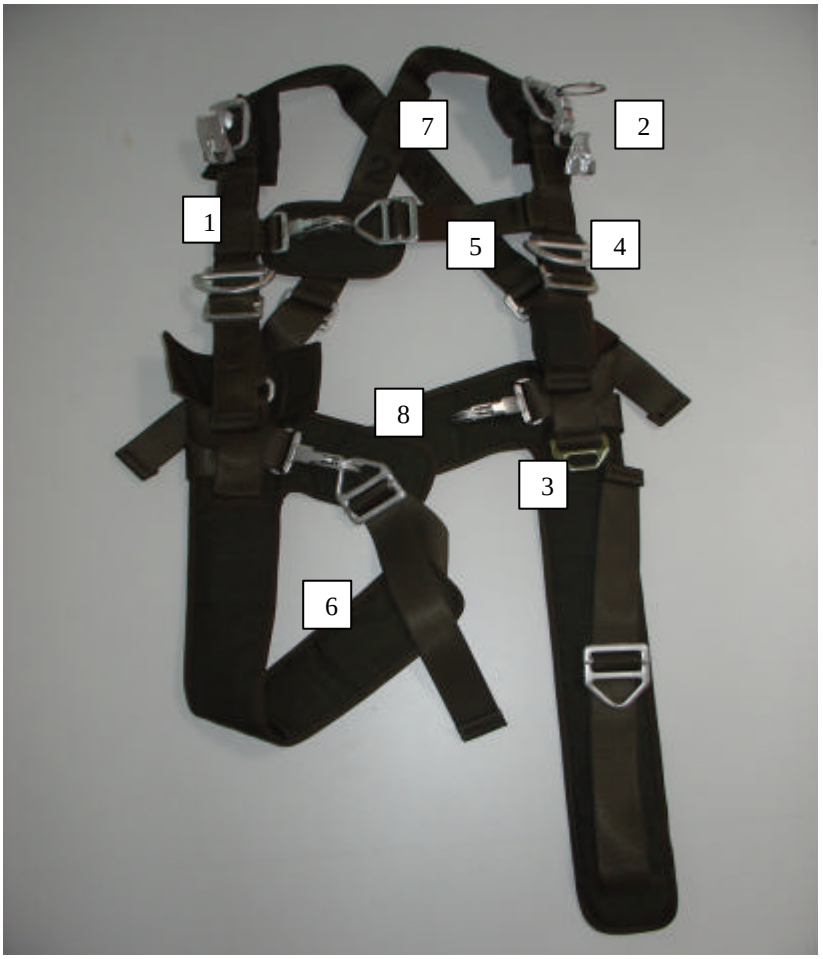


Fig. 3

2.4. Harness (Fig.4)

The harness consists of four riser belts, two main belts with chest straps, adjustable back belt with cross and transverse parts, the horizontal back strap and two leg straps.
The risers belts run from the D-rings of the parachute canopy to the canopy quick release lassambly that connect the risers to the main lift webs.
The adjustable chest belt is sewn onto the main webs above the D-rings that are used for hooking in the reserve parachute.
The chest strap and the leg straps, which are also adjustable, are fitted with snap hooks.
Protective padding is fitted under the quick release locks and under the ejector snap hooks. The canopy quick release assemblies are fitted with protective pads.



1 Main lift web
2 Canopy release assambly
3 Trapez-ring
4 D-ring
5 Chest strap
6 Leg strap
7 Diagonal back strap
8 Horizontal back strap

Fig. 4

3. Completion

The harness-riser connection (closing the quick release locks) is achieved as follows:
- Stick the upper part in the lower part of the quick release lock
- Engage the locking pivot in the upper part
  By pressing the locking section lightly with the thumbs and simultaneously pulling on the pull ring the locking pivots engage into the upper part.
- Position pull ring and close lid
- Pull over protective sleeve

The container is fixed to the harness with the harness fastener and the securing loops, whereby an adjustment can be made to suit the height.

4. Packing instructions

4.1. Packing aids

Packing can take place on a packing table, field packing lane or other suitable clean surfaces. The packing surface should be about 15 x 1,0 m. The usual packing tools should be used for packing (shot bag, packing stick, packing hooks).

4.2. Inspection

The parachute should be subjected to a careful inspection before each jump. In addition the appliance completed for use should be stretched on the packing surface from harness to the top of the canopy and the rigging lines are untangled so that all suspension and steering lines run from the base to the D-rings without being twisted or crossed over. With the canopy, gore 1 lies on top in the middle.
The inside base of the pack tray points upwards.

The following sequence for the inspection is appropriate:

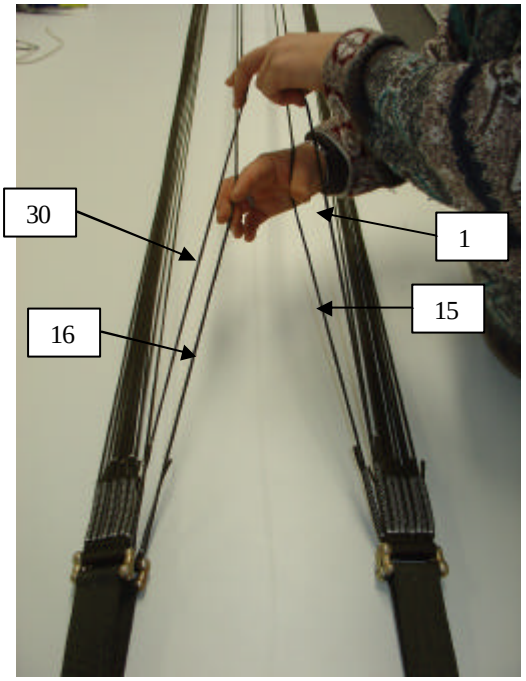
- Deployment bag with static line
- Canopy with rigging lines and steering system
- Harness
- Pack tray

As part of the inspection the following should be checked in particular:
- textile components
  for tears, soling, torn seams or other damage
- metallic components
  for breakage, tears or rust
- opening device parts
  check that the static line soft pin and its connection to the static line, grommets and running loop are in perfect condition

4.3. Packing

4.3.1. Arranging the canopy

The parachute is placed on the packing table as described in 4.2. It is secured at the top and on the harness with the appropriate packing aids and stretched.



The suspension lines have to be checked for a proper layout from the connector links of the risers to the canopy basic.
Right group should have line no. 1 on top inside and line no. 15 on bottom inside of connector link.
Left group will have no. 30 on top inside and no. 16 on bottom inside.
These lines have to run free from connector links to the canopy.

Fig. 5

The rigger stays on the right side of packing table with view to the canopy. He lifts the right group of suspension lines with his left hand and takes suspension line no. 15 (lays on bottom inside) in his right hand. He goes to the canopy and flips the right group of gores over the left group (Fig. 6).

Fig. 6

Fig. 7

Starting with line no. 15, which is still in riggers right hand, go anti-clockwise along the canopy basic and pick up line no. 14. With a smooth continous movement bring the left hand over the had. When the gore inflates, place line no. 14 on top of line 15.
This procedure will be continued till the last suspension line no. 16 (Fig. 7).

Every single canopy gore with the part of anti-inversion net, should hang smoothly and uncreased. Gores with steering slits will be handled in same manner.
After completing the arrangement of the gores, the suspension lines will be divided again in the left and right group and the canopy will be placed on the table, wich suspension line no. 30 on the top.

If the parachute canopy has been arranged properly (Fig.7), the device stamp must be located on the upper right gore (gore 1). The rigging lines 1 and 30 run free from the base line to the D-rings on the risers (Fig.8).

Fig. 8

The canopy basic will be arranged properly gore by gore. On the end, all gores and the related part of anti-inversion net have to lay one over the other.
It is important to stretch the sub-steering lines in direction riser/pack tray. For this the rigger lifts on the suspension line no.30 and pull out the two shorter and the two longer sub-suspension lines per each side (Fig. 9)

Fig. 9

Starting with the right canopy half, the base edge should be folded inwards so that the base edge lies longitudinally to the air channel (Fig.10). The left base edge is arranged in the same manner (Fig.11).

Fig. 10

Fig. 11

Then both halves of the arranged parachute canopy are folded to the middle, starting to the right side, so that their breadth in the base area is divided into three (Fig.12). The canopy as arranged is weighed down with shot-bags.

Fig. 12

Fig. 13

The steering toggles are stuck in the rubber loops on the risers (Fig.13).

4.3.2. Positioning the canopy in the deployment bag

After loosening the top loop from the fixture and the inner container is turned inside out, the bridle loop and the breakcord attaching strap are to be tied with an approx. 450mm long breakcorde tie (36daN) using reef-knots (distance bridle loop – breakcord attaching strap approx. 50mm, Fig.14).

Fig. 14

Fig. 15

The breakcord attaching strap should be pushed into the belt loop pocket in an S-fold.
Then the canopy should be placed in the deployment bag in S-folds so that the top lies in the right corner of the pack tray. The base edge lies on the front edge of the pack tray (Fig.15).

The deployment bag is positioned and the rigging lines are to be arranged in the packing in an S-fold down to the base net zigzag seam (Fig.16).

Fig. 16

Fig. 17

The protective flaps are placed inwards on the bottom. The deployment bag is closed in that the locking loops are stuck through the locking window of the closing flap and the securing loops through the slits of the closing flap. The locking of the flap is achieved with the rigging lines. With the aid of two packing hooks the rigging lines, starting on the right hand side, are looped into the locking loops (Fig.17).

The protective flaps are to be arranged using the packing stick. The packing should be given a flat form.

4.3.3. Looping in the rigging lines

For the first looping-in the rigging line bundle is to be arranged on the deployment bag diagonally to the rigging line loop at top right (Fig.18).
The looping in should be done with the aid of two packing hooks. During the looping-in process, the rigging lines must not be twisted or crossed over.
The rigging lines are to be looped in alternately, starting from right to left, until the remaining length of the rigging line bundle is shorter than the width of the looping (Fig.19). Thereby one damaged loop can be omitted on each side.


Fig. 18


Fig. 19

The rigging line bundle is then to be separated into its two half-bundles.
Two D-rings each left and right should be fixed with connector link tie, length approx. 400mm, to the securing loops with reef-knots. The rigging line protection flap is to be tied to the projecting ends of the shear tape with reef-knots. Both knots are on the outside (Fig.20).


Fig. 20

4.3.4. Positioning the deployment bag in the pack tray and closing the pack tray

The deployment bag is to be pulled up to the upper edge of the pack tray and the risers are to be folded onto the floor of the pack tray.
The deployment bag is to be laid on the risers and pack tray floor with the rigging lines protective flap facing downwards. Thereby it must be observed that the steering toggles fixed to the risers lie under the deployment bag (Fig.21).


Fig. 21


Fig. 22

The static line is placed on deployment bag in a small S-fold and led upwards to the right. Then the four pack tray closing flaps are pulled over the deployment bag. The two side flaps are closed using a packing cord that is pulled through the running loop on the right side flap, and a coupling pin is used for fixing (Fig.22). Then the lower closing flap (Fig. 23) and finally the upper closing flap are pulled over and closed in same way. Before closing the upper flap, the two tongues, fixed on the end of the side flaps have to be staked between deployment bag and riser. By fixing the flaps in these position with one hand, the upper flap is pulled over the deployment bag by the other hand (Fig. 24).


Fig. 23


Fig. 24

The static line has to come out between the upper and right closing flap .
The packing cord is then removed.

Starting below right, the static line is looped into the flat rubber loops on the upper closing flap without any twisting (Fig.25). The snap hook fixed to the end of the static line is stuck into the pocket on the closing flap on the right hand side of the container.
The cover is placed over the upper closing flap and secured with the tongue staked under the elastic band on the inner side of upper flap. The flaps are pulled flat and smoothed.

Fig. 25

4.3.5 Put on the parachute and fixing the harness

The harness offers great comfort and different ways of adjustability. To use this opportunities as good as possible following way of fixing the harness on jumpers body is recommended:

a) check the correct positioning of the diagonal back straps. Following position is recommended:

upto 155 cm height:	Position S
upto 165 cm height:	Position 1
upto 175 cm height:	Position 2
upto 185 cm height:	Position 3
over 185 cm height:	Position L

Fig. 26

b) Put on the parachute and fix the harness. At first close the leg straps, than the chest strap
c) Adjust the straps step by step
    1. Leg straps (Fig.27)
    2. Back straps (simultaneously), by bending forward (Fig.28)
    3. Main belts (simultaneously), by raise up (Fig. 29)
    4. Chest strap


Fig. 27


Fig. 28


Fig. 29

d) the ends of the main belts are covered by protection flap (Fig. 30)
e) The harness is correct fixed, if the chest strap is at chest region and quick release assembly is at collarbone area (Fig. 31). The harness should fix and fit well at the body


Fig. 30


Fig. 31

5. General guidelines

5.1. Jump and landing

The jumper should consider both the jump from the aircraft and the landing as the most important parts of a parachute jump, and that they require his total concentration.
With a proper jump the rolling over of the jumper during the unfolding phase can be avoided, just as the correct behaviour on landing can rule out any risk of injury.

Do not use the parachute out of the foreseen limits (dropping out altitude, dropping out speed, payload). Minimum dropping out altitude during training is recommended with 250 m (800ft) from aircraft and 300m (1,000 ft) from helicopter. In case of emergency, the parachute can be used from minimum altitude 150m ((500ft) from aircraft and 250m (800ft) from helicopter.

The RS-4/4T is equipped with a 15ft standard length static line. It may happen that for special types of aircraft/helicopter a static line prolongation is needed. Such prolongation can be ordered by the manufacturer SPEKON GmbH.
Depending from jumpers qualification it is recommended to use the parachute up to ground wind speed of 6-8m/sec maximum.

On landing the following should be observed in particular:

- No landing while turning!
- Position the parachute against the wind direction at a height of 50 to 100 m above ground. By doing this it gets an increased uplift and decreased fall velocity
- **It is dangerous to land with back wind, the wind speed and the canopy self drive will be added to a high horizontal speed**
- On being dragged along the ground after landing, the canopy can be separated using one of the quick release locks on one side of the harness.

5.2. Steering and braking

Both of these are achieved in the general standard way, in that the canopy turns in the respective direction in which the steering toggle was pulled and its own thrust is reduced or lost completely if the steering toggles are pulled on both sides.
On braking fully there is a slight increase in fall velocity, which is why this should be avoided on landing. Jerky pulling on the steering toggles leads to slight pendulum swing and should therefore also be refrained from.

5.3. Repair guidelines

Faults discovered during the inspection will be remedied
- either by swapping the unserviceable parts,
- or by the user repairing it himself, as long as the parachute does not require factory repairs at the manufacturers, or the damage is so severe that the parachute has to be written off.

The exchangeable parts of the parachute include:

- pack tray
- deployment bag with static line
- harness
- rubber loops
- transport bag.

All repairs which are carried out by the user must be made in accordance with the “Repair Regulations for Personal Parachutes“, published by SPEKON Sächsische Spezialkonfektion GmbH.

5.4 Material Specification (Parachute canopy)

Item	Specification
Canopy fabric, uncoated	MIL-C-7020, Type 1
Canopy fabric, coated	MIL-C-7020 , Type 1 coated G-401-6
Longitudinal Reinforcement tape, 14,5 mm	MIL-T-5038, Type III, 14,5 mm
Horizontal Reinforcement tape, 25,5 mm	MIL-T-5038, Type III, 25,5 mm
Upper lateral band	MIL-T-6134, Type I, 25,5 mm
Lower lateral band	MIL-T-6134, Type I, 25,5 mm
V-tape (suspension line fixing at canopy)	MIL-W-4088, Type I,
Suspension line	MIL-C-5040, Type II
Steering line	MIL-C-5040, Type II
Bridle loop	MIL-W-4088, Type VIII
Basic net	3 ¾” x 3 ¾”
Connector Link	50 B 6869, MS 22002
Steering toggle	SPEKON 500-01-67
Sewing yarn	DFL-5029 (Nm 11/3)
Sewing yarn	DFL 5008 (Nm 40/3)