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UT-15, SERIES 2 PARACHUTE

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The 24-shroud, capron sports parachute opens at speeds up to 225 km/h; descent rate is 5.1 m/sec; canopy area is 51 m<sup>2</sup>. Construction, maneuvering, rigging and user adjustment of the parachute are discussed.

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Many aviation sports clubs of the country have received the new, highly-maneuverable sport-training UT-15 series 2 parachute. It is intended for sportsmen (not below the first sports class), having experience in work with slotted parachutes.

As is well-known, the USSR mixed squad, entering the XI world championship in the USA with UT-15 parachutes, won gold medals. In jumps for landing accuracy, international class sports master Al'bin Dyuzhova became world champion. In the last year alone, Soviet parachutists with the UT-15 set 45 All-Union records, which exceeded world records.

The parachute is reliable in operation. One can jump with it at any opening delay, at flight speeds up to 225 km/h. The descent rate (with a total sportsman flight weight of 100 kg) is 5.1 m/sec, horizontal displacement is 5.1 m/sec, in reverse (speed backwards), 1.5-2 m/sec, and a 360° turn is accomplished in 4-5 sec. The canopy area is 51 m<sup>2</sup>, and it is made of capron (Soviet name for polycaprolactam resin and fiber) materials of various air permeabilities (a canopy diagram is given in Fig. 1).

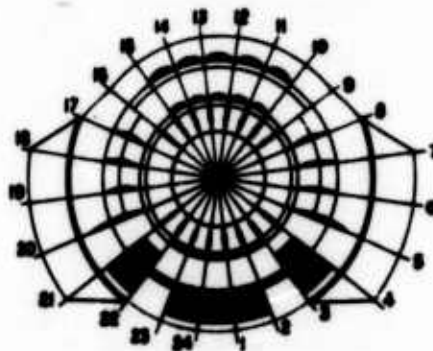


Fig. 1 -- Canopy Diagram

There are slots of various sizes in the canopy. In order to decrease dynamic loading when opening, a system of radial openings and ducts is located in the upper part of the canopy. The vents through which air escapes upward are made in the 5 front panels, between shroud lines 10-16. They facilitate increase in horizontal movement speed and reliability in opening of the parachute.

Control of the UT-15 canopy is accomplished by means of a system of flaps and slots. The lateral flaps are connected to the control shrouds, which terminate in toggles and come out on the rear straps. The slots in the rear portion of the canopy, between shrouds 21-22, 23-24-1-2 and 3-4, as well as the ducts, increase the horizontal speed. The maximum forward speed is achieved with the control shrouds completely slack (Fig. 2); if they are pulled up to the end, the speed decreases to a minimum (Fig. 3). In this case, the rear skirt of the canopy drops down (by 1-1.5 m), the escape of the air stream from beneath the forward portion, as well as through the slots and flaps, increases, the canopy slows down and it changes to the reverse mode. The vertical descent rate increases in this position.

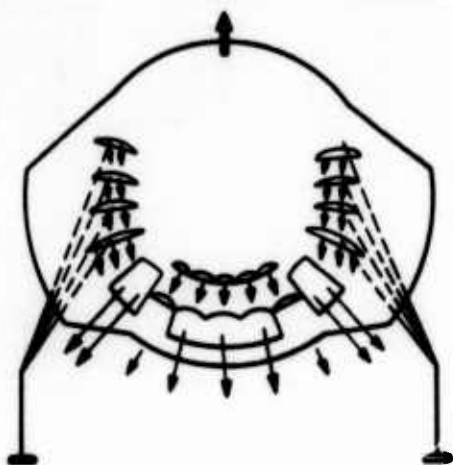


Fig. 2 -- Forward Movement

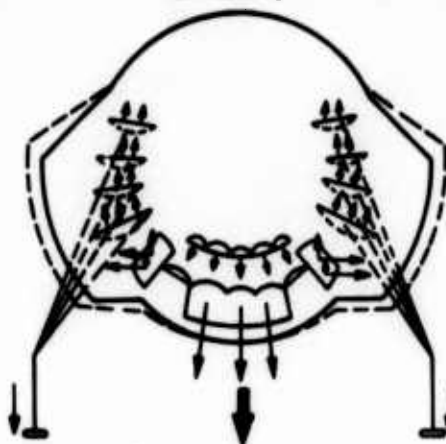


Fig. 3 -- Braking

In order to execute a turn to the left or to the right, the corresponding control shroud should be tightened (Fig. 4). The turn rate depends on the amount of motion of the hand on the toggles. A rapid turn is achieved by simultaneous pulling on the toggle in the direction of rotation and releasing the opposite one. In zeroing in on the target at low altitude, it is not recommended that a turn be accomplished by lowering the toggle

below the zero mode; this leads to increase in the vertical speed. Such turns can be employed at high altitude, if it is necessary to lose altitude for some reason, for example, during group jumps, if the sportsmen interfere with one another (find themselves at the same altitude), with an inaccurate calculation, when the parachutist releases too near the target.

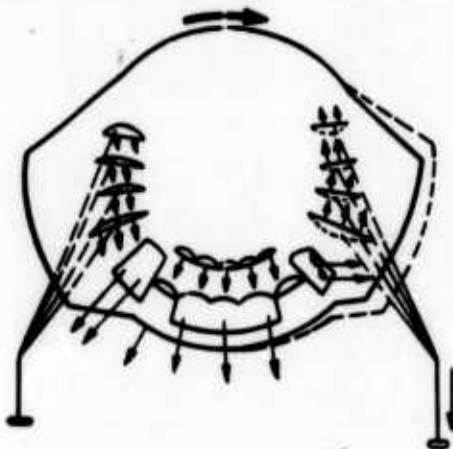


Fig. 4 -- Turn to the Right

In order to improve maneuverability of the parachute, the control shrouds can be connected to large openings located in the rear half of the canopy (between shrouds 3-4 and 21-22). In this case, the turning time is decreased, the effectiveness of braking is increased and, at the same time, the effort in pulling on the toggles increases.

The UT-15 series 2 is opened by means of a pull ring. If, for some reason, a man cannot open the parachute himself, he activates a semiautomatic type PPK-U instrument, set for a definite height (with account taken of atmospheric pressure and terrain relief in the landing area) or for a triggering time.

In what position is it best to open the parachute?

This method is recommended: the legs are extended, slightly tensed, the body is inclined forward ( $45-50^\circ$ ), the head is straight. At the moment of jerking the pull ring, the back should be barely rounded, in order to create the most favorable conditions for disruption of the air flow by the pilot chute. Then, the horizontal position must be assumed again, until full opening of the canopy. One should not turn the head to observe the emergence of the parachute shroud lines or filling of the canopy,

since the DFE catches may strike the face at the moment of dynamic impact. After carrying out acrobatics, it is desirable to fall "flat" for a few seconds, in order to decrease the speed, after which the parachute is opened.

After the pack is unpinned by the action of the conical springs, 2 pilot chutes, the area of each of which is  $0.4 \text{ m}^2$ , are uncovered. Caught by the airstream, they pull out the cover from the canopy packed in it and unpin the pocket at the bottom of the pack. After the shroud emerges from the honeycomb, the cover drops down and the canopy is filled.

The pilot chutes, in turn, are connected to the canopy cover and to auxiliary shrouds (which are led through an eye ring at the top of the canopy), by means of a connecting link  $2.04 \text{ m}$  long. In this case, the distance between the point of contact with the eye ring and the cover loop is  $1.44 \text{ m}$ , and from the cover loop to the pilot chute,  $0.6 \text{ m}$ . After the casing is uncovered the pilot chutes remain on the canopy.

Rigging the latest UT-15 model differs somewhat from that of preceding parachutes of this type. The cover is slipped over the auxiliary shrouds of the canopy (Fig. 5A). A portion of the connecting link (from the points of attachment to the canopy and to the cover) is gathered into a rubber sleeve (Fig. 5B). Then, the connecting link, together with the auxiliary shrouds, are packed into the canopy cover (Fig. 5C). After this, the top of the cover is drawn together and tied with a special cord.

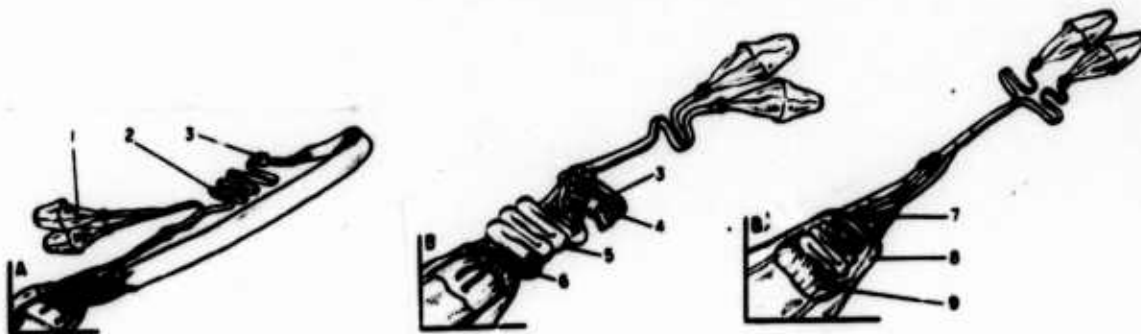


Fig. 5

Key: 1. Pilot chutes; 2. Connecting links; 3. Rubber sleeve; 4. Mark on connecting link; 5. Auxiliary canopy shroud cover; 6. Auxiliary shrouds; 7. Draw-cord; 8. Canopy cover; 9. Canopy.



Rigging of the canopy in the pack is similar to rigging the T-4 series 4M. The pack is drawn toward the cover with the packed canopy. Further, the free ends of the parachute harness should be placed so that the half-ring-buckles are in the center of the bottom of the pack. The free ends of the straps should be located between the rubber honeycomb and the pocket. It must be seen to that the buckles do not become entangled with the shrouds. Inserting the rubber honeycombs into the pocket openings, they are pinned in (first the left and then the right) with the common group of shrouds. It must be seen to that the place where the shrouds are stitched does not get into the pinned honeycomb. Then, the cover and canopy are stowed in the bottom of the pack, on which the pockets are drawn up. The unpacked top of the canopy and the pilot chute should be on the side of the lower flap of the pack. Having inserted the pull ring pins into the openings of the upper and middle cones, one of the pilot chutes is set under the latter (on the side of the lower flap), so that the center of its base is under this cone. The second pilot chute is placed under the closed lower cone, and then the lower flap is fastened.

It is recommended that the first jumps with the UT-15 be made in good weather, when the wind strength does not exceed 3 m/sec. This makes it possible for the sportsmen to become acquainted with the individualities and control of the parachute and also, if necessary, to adjust it to his own weight. The canopy must be inspected in the air. It should have a well filled shape: the flaps open as wide as possible, the toggles not tight -- they hang freely, not touching the control ends of the straps. The length of the flap control shrouds is made such that, if they are tightened, those flaps which are closest to the forward panels (between shrouds 7-8-9 and 16-17-18) function first in sequence, and then, when the control shrouds are pulled out by 8-12 cm, the remaining ones begin to function.

Adjustment of the control system is best begun with the flap shrouds (called "noodles" by parachutists). If the shrouds sag (the flaps seem to "slap" during the descent), their seams must be ripped off at the flaps on the ground, and they must be drawn up by the amount noted visually in the air. After a final test, the excess length is cut off and the ends of the shrouds are secured.

During the following jumps, the main control shrouds, ending in the toggles, are checked. Their length should be chosen so that, in the neutral position (completely slack), they do not affect the horizontal displacement speed. If a spontaneous turn takes place during a descent, the reason for it may be irregular opening of the flaps, which is easily seen in the air, with a filled canopy. The length of the control shrouds should be measured on the ground. They should be identical. It also is

necessary to ascertain whether or not the parachute harness is out of alignment and to measure the length of the central shroud. If necessary, the main control shrouds should be shortened (the knots at the end are untied, and then they are drawn up to the length noted visually in the air).

The vertical descent rate depends on the length of the central shroud. Its length (with the canopy stretched out on the ground) should correspond to the marks on the free ends of the parachute harness, which are located 180 mm from the end of the strap (Fig. 6). The central shroud line is extended during use. The shrouds are untied at the half-ring for adjustment (Fig. 6A). The excess length is cut off, and then the line is again secured to the half-ring with the special knot shown in Fig. 6A. Its end is secured in 2 places 50 mm apart.

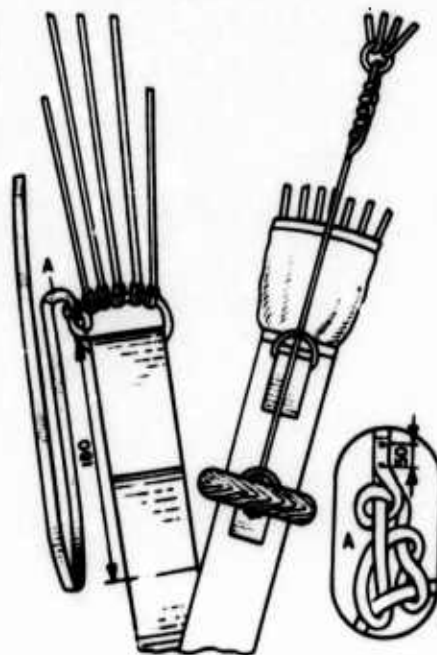


Fig. 6 -- Central Shroud Assembly Diagram

DFE (disconnected free end) catches are located on the free ends of the parachute harness. They are intended for uncoupling a main parachute canopy falling in the air, in order to create the most favorable conditions for opening the reserve one, as well as for clearing the canopy on the ground, during jumps in a strong wind.



The UT-15 has received high ratings from parachutists, both in our country and abroad, for its sport and technical characteristics.

Sportsmen's clubs receiving the new UT-15 parachute should first study the materials, rigging and canopy control and, only then, make jumps. A good knowledge assists in more rapidly mastering the parachute and achieving great sporting results.