HANG GLIDER

TARGET

MANUAL

Size: _____

Manufactured by:

AEROS Ltd.
Post-Volynskaya St. 5.
Kiev, 03061
UKRAINE

Tel: *(380 44) 455 41 18*
Fax: *(380 44) 455 41 16*
E-mail: aerosint@aerosint.kiev.ua
http://www.aeros.com.ua

Date of production: _____

Serial number: _____

T A B L E O F C O N T E N T S

Section 1. M A I N I N F O R M A T I O N

1.1. INTRODUCTION

Hang glider “Target" was created by a design team of Aeros Ltd. It's birth is a result of extensive design and improvement of the glider, aimed for those who make a first steps in the sky.

Hang glider "Target" allows you to train with a maximum level of safety. With this glider you will acquire right skills of handling and confidence in your qualification and also receive a real pleasure of soaring.

Please read and be sure you thoroughly understand this manual before flying your "Target". Don't try to make first flights without help of instructor or HG-school. If you don't know where to find HG-school in your region - ask your dealer or your national HG-club.

Be sure you are thoroughly familiar with the set up, break down, preflight and maintenance procedures as described in this manual. Flying hang glider, don't leave anything without check. If any doubts appear - stop your work and find out what's wrong, check with manual, contact instructor or more experienced pilot.

1.2. TECHNICAL INFORMATION

	TARGET 13	**TARGET 16**
Sail area, sq.m. (sq.ft)	13,4 (144)	16,2 (174)
Wing span, m. (ft)	8,65 (28.4)	9,6 (31.5)
Aspect ratio	5,6	5,7
Nose angle, deg	118	120
Pilot weight optim, kg (lbs)	60 (132)	75 (165)
Weight (without bags), kg (lbs)	24,5 (54)	26 (57.3)
Breakdown length, m	5,1 / 3,2 / 2,0	5,7 / 3,8 / 2,0
Min sink rate m/sec (fpm)	1,1 (216)	1,1 (216)
Glide ratio	7	7+

1.3. FLIGHT LIMITATIONS

Hang glider "Target" is designed for foot launching and for educational and training flights. It was not designed to be motorized and not flown at angles of bank beyond 60 degrees. Operation in any of these modes may severely compromise your safety.

Flying any hang glider in the presence of turbulence or qusty winds can result in accident. Don't fly in such conditions.

	TARGET 13	**TARGET 16**
Wind speed max, m/s (mph)	12 (27)	12 (27)
Take off altitude max, m	2500	2500
Permissible range of temperature, ?C	-20 … +40	-20 … +40
Minimum airspeed, km/h (mph)	26 (16)	24 (15)
Maximum airspeed, km/h (mph)	70 (44)	70 (44)
Minimum pilot weight, kg (lbs)	45 (99)	60 (132)
Maximum all up pilot weight, kg (lbs)	75 (165)	100 (224)

Hang glider "Target" passed all structural and flight tests in the British Hang and Paragliding Association (BHPA) and admitted to exploitation as hang glider for beginners.

Certificate of BHPA :
No.9511108 (for Target 16)
No.9511109 (for Target 13)

Your hang glider "Target" was tested on:_____

by:_____

Section 2. S E T U P P R O C E D U R E

2.1. SET UP PROCEDURE FROM THE PACKAGE 2m LONG

2.1.1. Undo the cord securing the package. Remove the bag 2-metres long.

2.1.2. Undo and remove securing tapes, unfold the bag 6-metres long.

2.1.3. Place completing parts of the frame with comfort (Fig.1). Undo the zipper on the bag and move the sail.

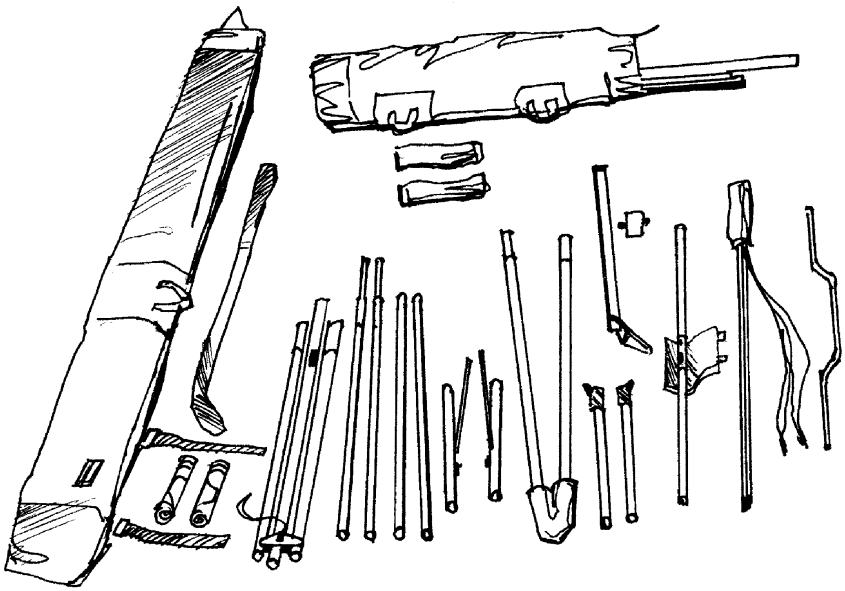


Fig.1

2.1.4. Remove protective bag from the bottom of uprights. Spread the uprights. Install the speedbar so that off-set of the speedbar is directed forward and upwards to the flight direction (in the same direction as bottom front wires with the hook). (Fig.2).

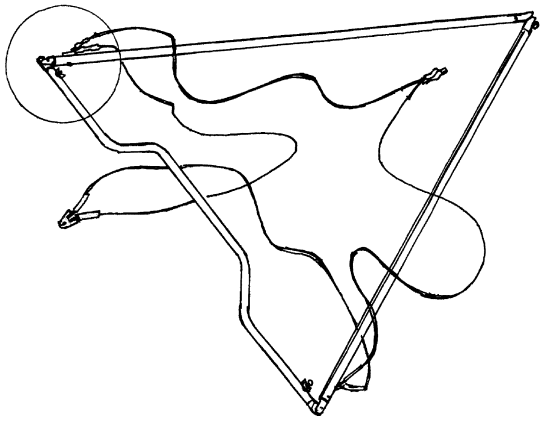


Fig.2

If your glider is supplied with wheels, secure wheels on the speedbar now.
Fix the speedbar using the bolts, wing nuts and the safety rings (Fig.3) or using quick-pins.

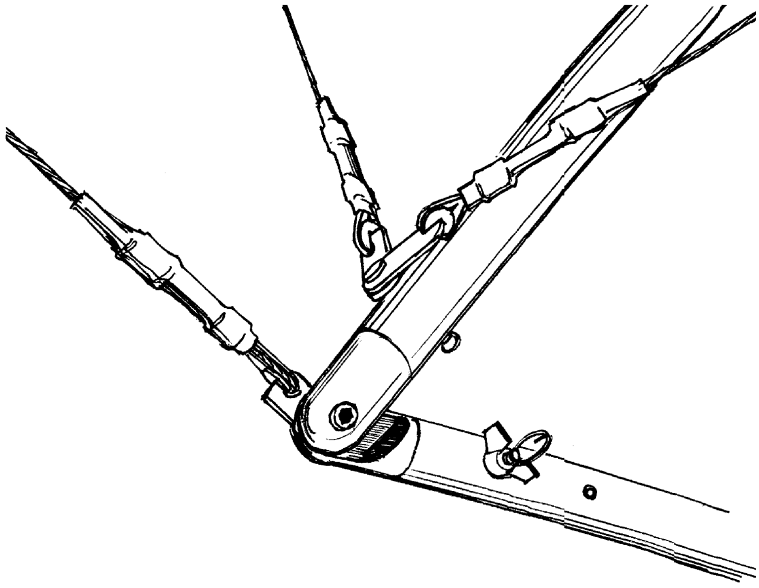


Fig.3

2.1.5. Lay the N1 keel tube with N1 leading edge tubes so that the channel which secures the control bar is above. Attach the uprights to the channel using the bolt which is put through the channel and through the tops of the downtubes and fix them with the nut and the safety ring (Fig.4).
NOTE: Pay attention to the proper installation of the downtubes. Bottom front wires with the hook must be on the top.

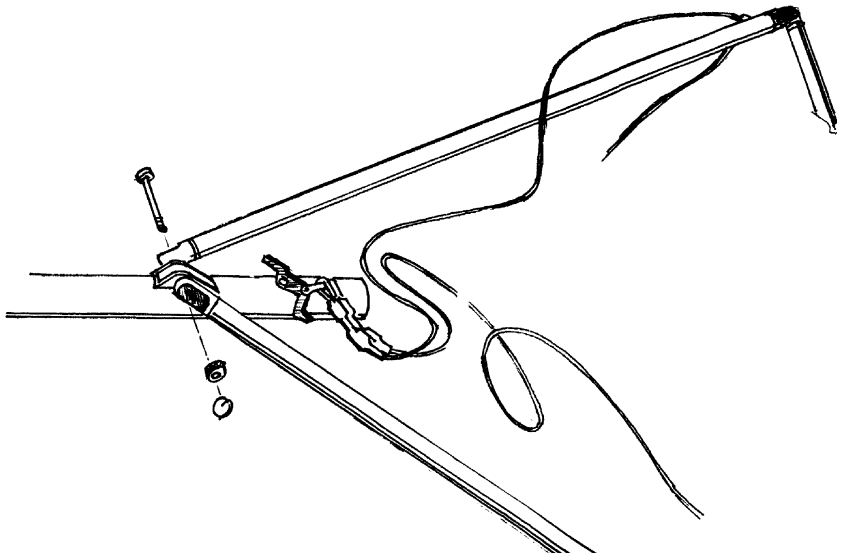


Fig.4

2.1.6. Turn the front part of the frame with uprights so that the channel which secures the kingpost is on top. Attach the N2, N3 and N4 leading edge tubes using the telescopic connectors which are fixed with button springs. While performing the set up procedure of the leading edge keep to the following marking: L-left, R-right (Fig.5).
Tubes N4 fix with the pin secured by the safety rings. Washout tips must be directed as shown in Fig.5a. Check that the tube junction in the telescopic connectors are secure.

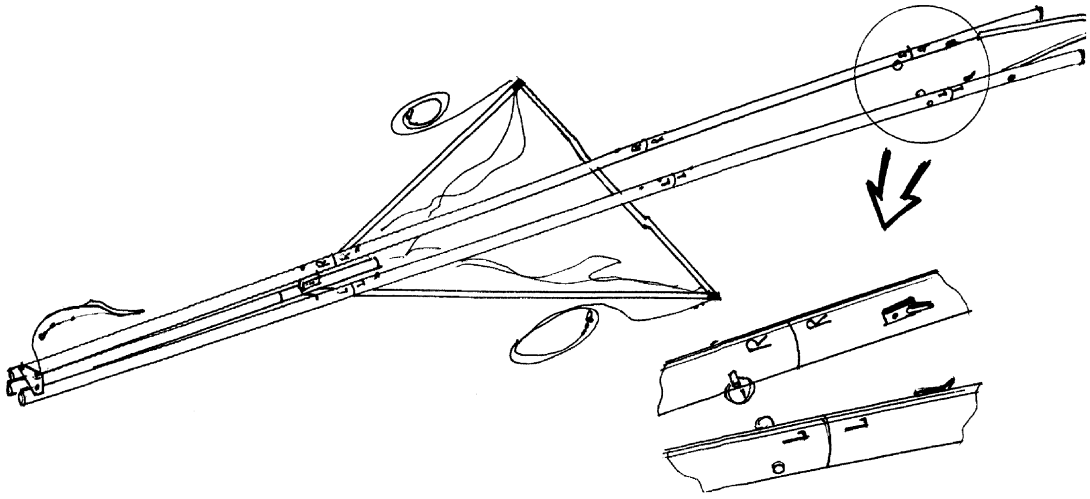


Fig.5

2.1.7. Set up the crossbar: attach the N2 tubes to the N1 tubes of the crossbar, keeping to the following marking: L-left, R-right.
Fix the junction with the button springs.

2.1.8. Lay and spread the sail. Spread the leading edge of the sail so that there are no folds and bends in it. Pushing the mylar by both edges insert it into the leading edge pocket. Bow - shaped edge of the mylar must pass on the side of the seam that joins the top and bottom surface and the leading edge of the sail (Fig.7).

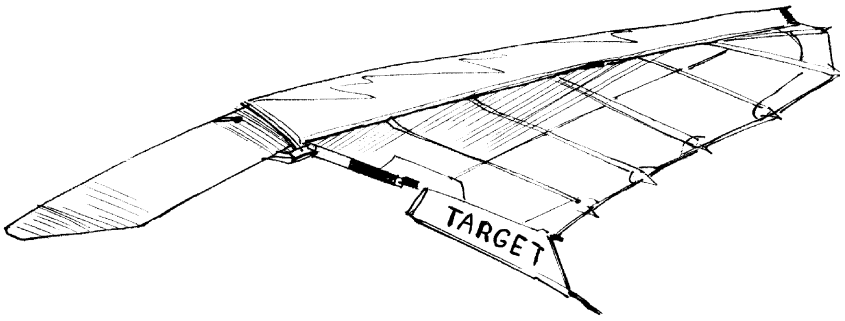


Fig.6

It's more easy to pull last 20-30 cm by your hand using a chink between the leading edge and top surface of the sail on the wing tips. (Fig.7).

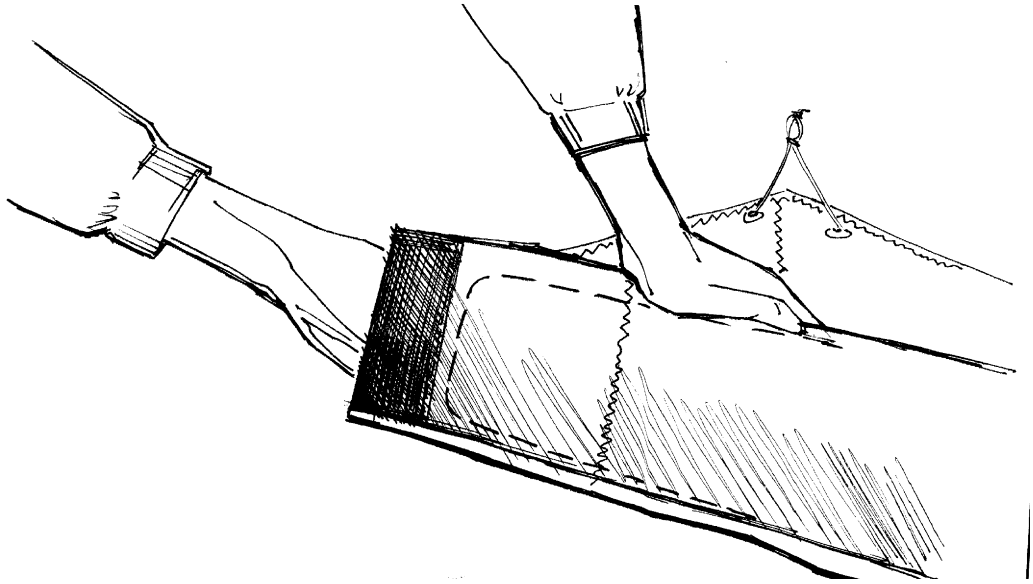


Fig.7

2.1.9. Place the A-frame nose to the wind.
Lay the sail nose to the console ends (Fig.8).
Lift slightly the leading edge tubes and insert them into the sail (Fig.9). Make sure that leading edge tubes pass properly into the sail, not in the holes for cross-bar. Keel tube must be out of the sail.
Insert washout tips into corresponding holes in the sail.

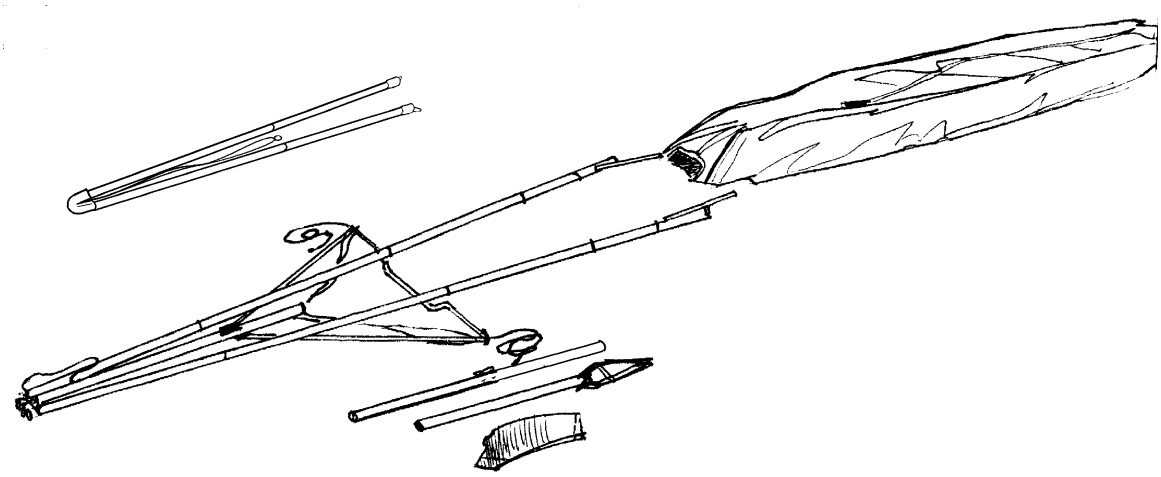


Fig.8

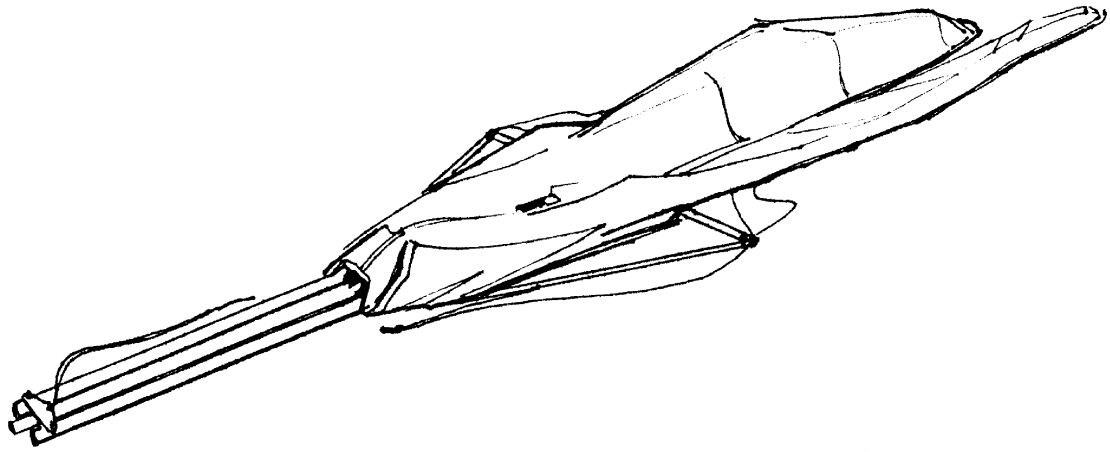


Fig.9

2.1.10. Spread wings about quarter way and lift slightly the sail above the keel tube. Put the crossbar on the keel tube so that crossbar tensioning wires pass through the channel of the kingpost. The plates of leading edge/crossbar junction, should be near corresponding holes in the leading edge (Fig.10).

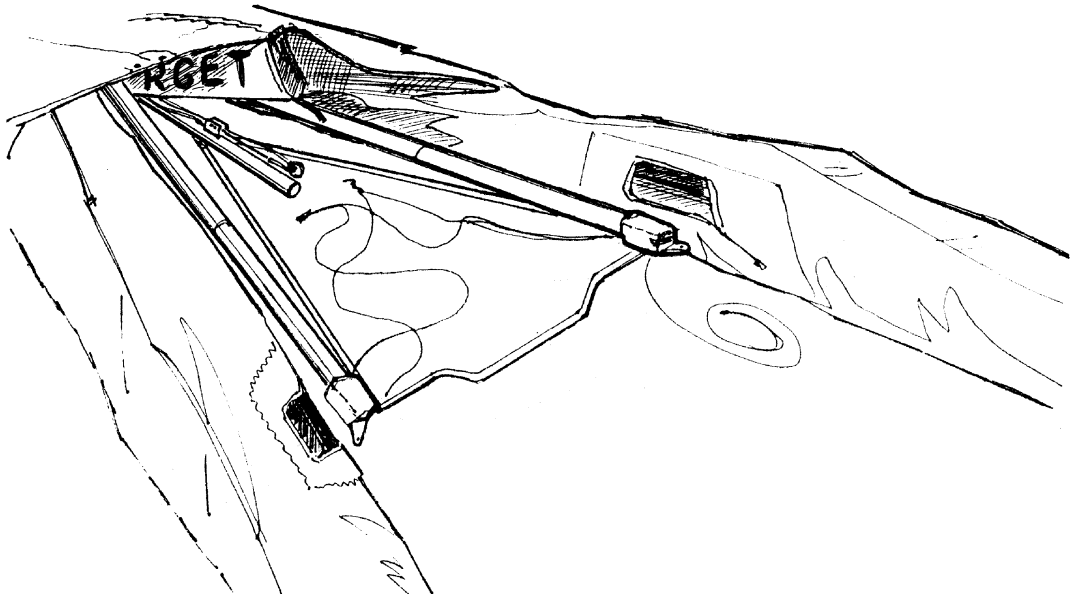


Fig.10

2.1.11. Put the hang strap which is on the kingpost through the kingpost hole in the sail and fit it over the end of N1 keel tube so that the spreader bar of the hang strap is under the keel tube. Install the kingpost into the kingpost channel. **Make sure that crossbar tensioning wire pass through the kingpost channel.** Secure the kingost with the clevis pin and the safety ring (Fig.11).

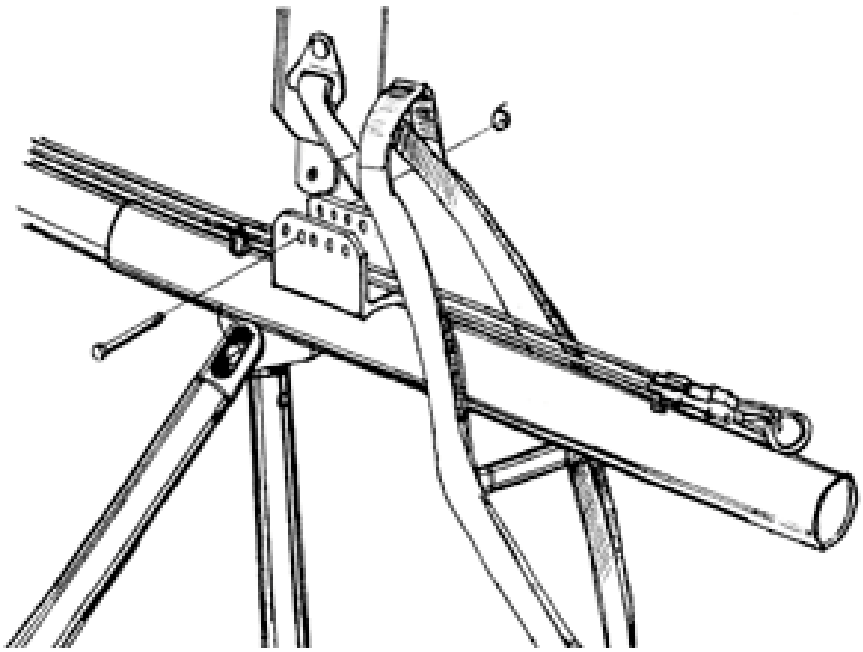


Fig.11

On your hang glider Serial No._____ kingpost secures in the channel through the hole No._____(Fig.12) for a pilot of ____ kg weight.

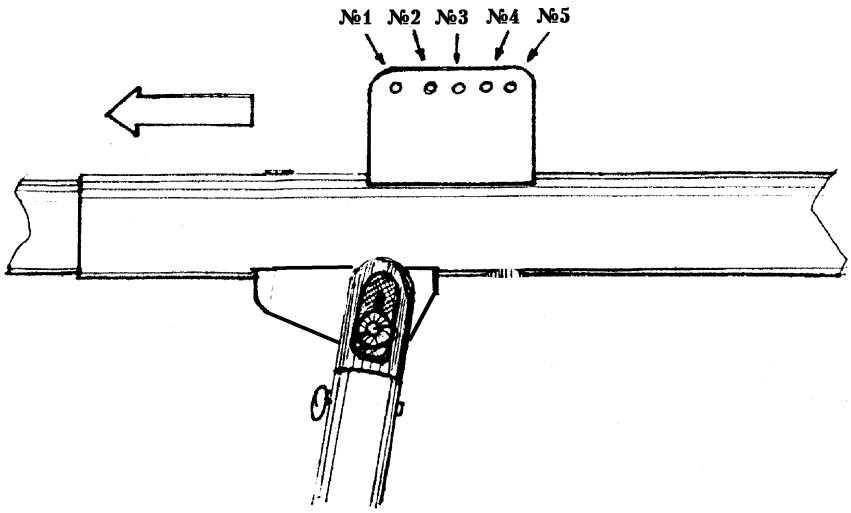


Fig.12

2.1.12. Insert the keel tube N2 into the keel pocket and attach it to the N1 part, pressing on the button spring and pushing the tube.

2.1.13. Put the top front wire through the corresponding hole at the nose of the sail. Put the tightening rope of the nose of the sail under the front end of the keel tube (Fig.13).
Insert the keel batten into the keel batten pocket beginning from the nose of the sail.

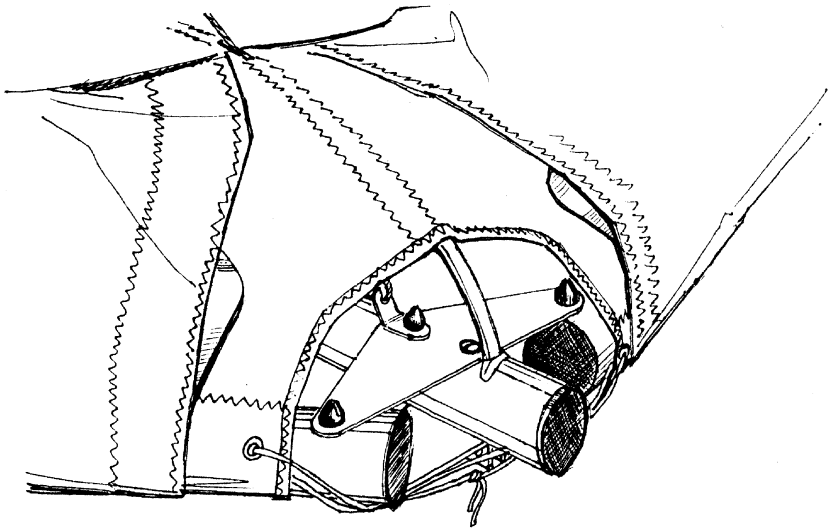


Fig.13

2.1.14. Insert the top side wire in the kihgpost cap slots, then insert the top front wire. Install the cap cover which fixes the wires (Fig.14).

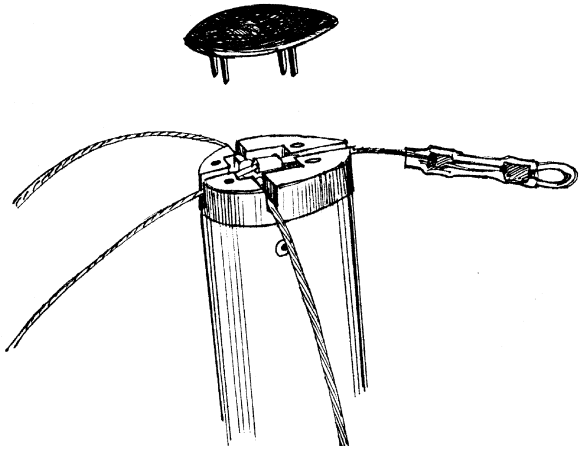


Fig.14

2.1.15. Put the top and bottom side wires through the corresponding holes in the sail. Undo the zippers on the bottom surface near the leading edge/crossbar junction and check that the wires pass through the holes.
NOTE: There are usually the bolt of the crossbar/leading edge junction with the standoff and fluoroplastic washer, the nut and the safety ring on the tang of the bottom side wires. Take them away from the tang before putting the wire through the holes in the sail.

2.1.16. Assemble the leading edge/crossbar junction (Fig.15).
To make this use open zippers on the bottom surface. Any wire must not be wrapped around any tube.
Insert the bolt into the hole of the leading edge tube from the underside. Install the standoff (and 6-mm plastic washer for Target 13) on the bolt from the top side. The concave part of the standoff must lie on the tube. Fit the tang of the bottom wire over the bolt. The wire part of the tang must be turned to the keel section of the glider. The bent part of the tang must point downwards. Then fit the fluoroplastic washer, the crossbar/leading edge junction plate on the crossbar over the bolt. Fit the tang of the top side wire over the bolt.
Fix the joint using the nut and the safety ring (Fig.16).
NOTE: The bottom wire as mounted must not pass in front of the leading edge tube.
The top side wire as mounted must pass in front of the crossbar.
Check the junction once more taking into account its maximum loading while in flight.

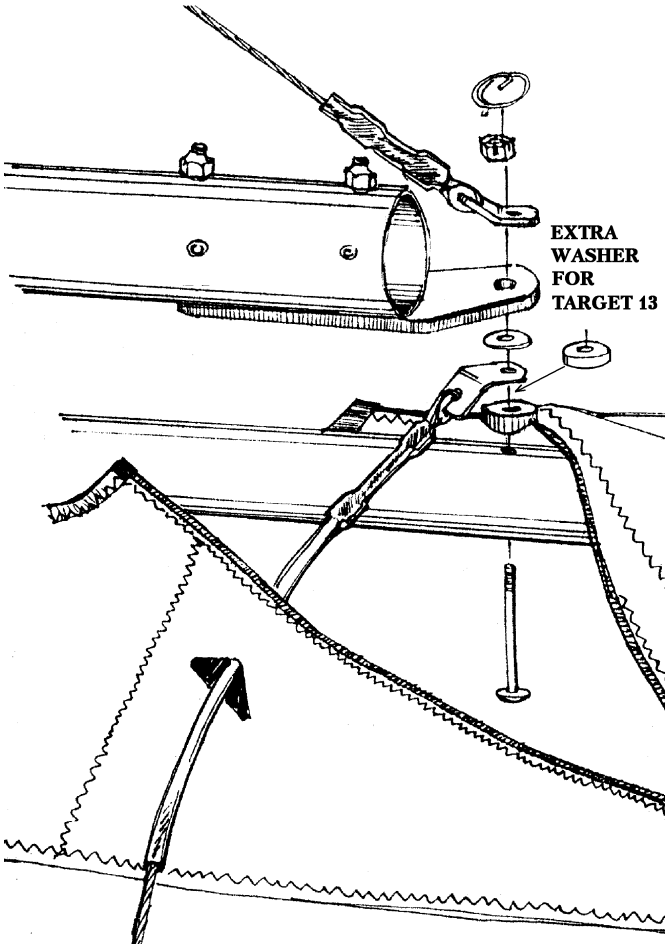


Fig.15

2.1.17. Tighten the sail along the leading edge and put the sail mount webbing into the slot in the endcap. Fix the sail by inside velcro. (Fig.16).

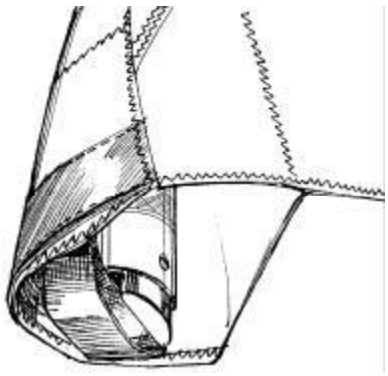


Fig.16

2.1.18. Pass top rear wire through the tape loop near the connection of the keel pocket and the sail. Secure the tang of the bottom rear wires, the keel mount webbing (from the underside) and the tang of the top rear wire (from the upper side) using the bolt fixed with the nut and the safety ring (Fig.17).

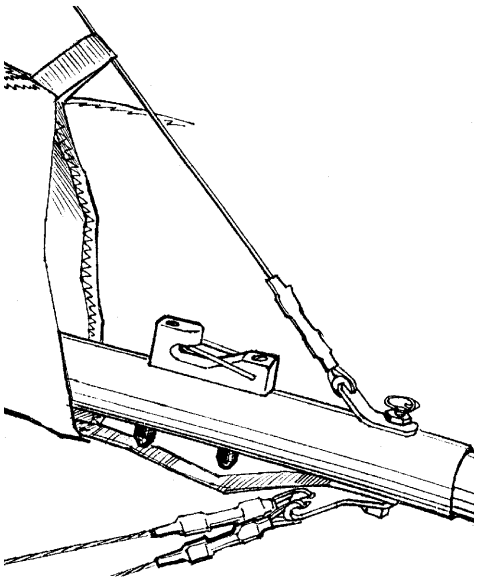


Fig.17

2.1.19. Lift the nose of the glider. Rest the glider on the control bar. Check that bottom wires are situated properly near the control bar. Carefully spread the wings so, that sail is a little sagged. Check that the sail mount webbing is seated squarely and securely in the slot in the endcap.

NOTE: If the wind is strong you may rig the glider flat on the ground, not standing on the control bar. But with a weak wind try to rig the glider on the control bar. In such case your glider will look new for a longer time.

2.1.20. Attach the hook of the top rear wire and the luff lines to the thimble of the top front wire (Fig.18) and spread out wires, attached to the hook, properly.

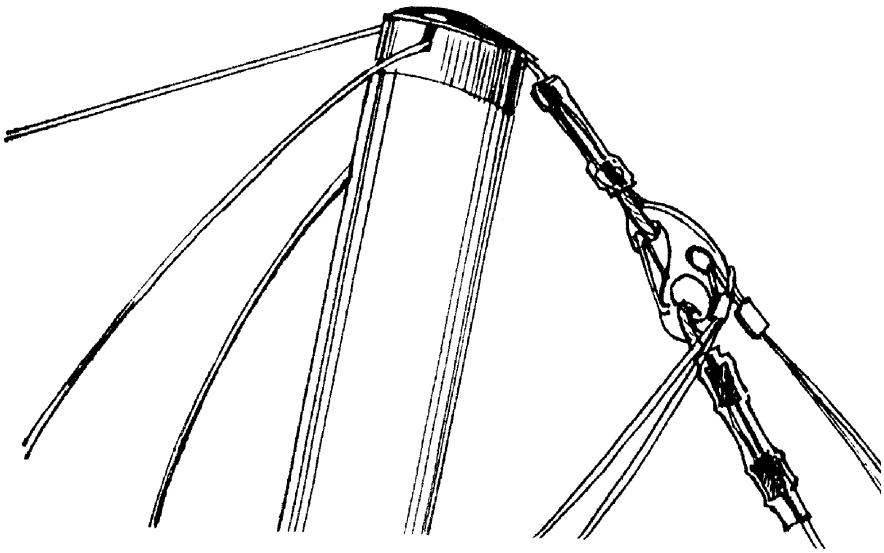


Fig.18

2.1.21. Put the short luff lines through the grommet which is free from the batten tension leech line and which is near the 2-nd batten pocket from the keel. Fit the washers and the safety ring over the wire loop (Fig.19).
Perform the same procedure with the long luff lines, after its installation through the free grommet near the 3-rd batten pocket from the keel.

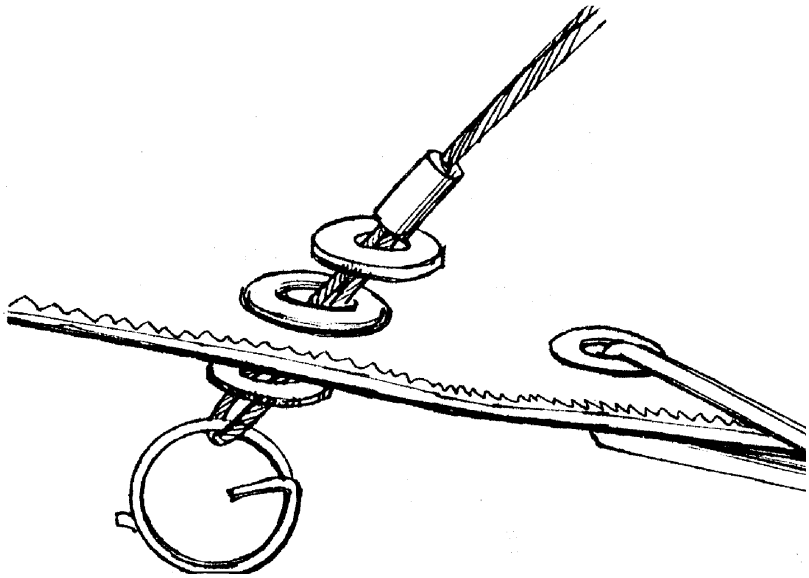


Fig. 19

2.1.22. Put the crossbar tensioning wires through the keel pocket. Don't twist the wires. Fix the maillon of rubber rope to the ring of crossbar tensioning wires (Fig.20).

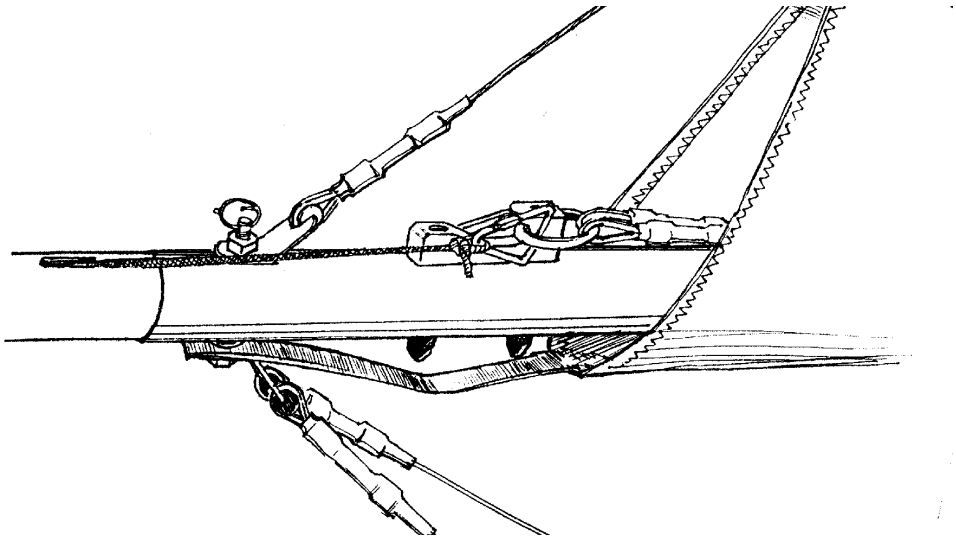


Fig. 20

2.1.23. Remove the battens from the bag. Battens No.1 and No.2 are dismountable for a transportation in a short package. Assemble them using pins provided and secure with plastic tube (Fig. 21).

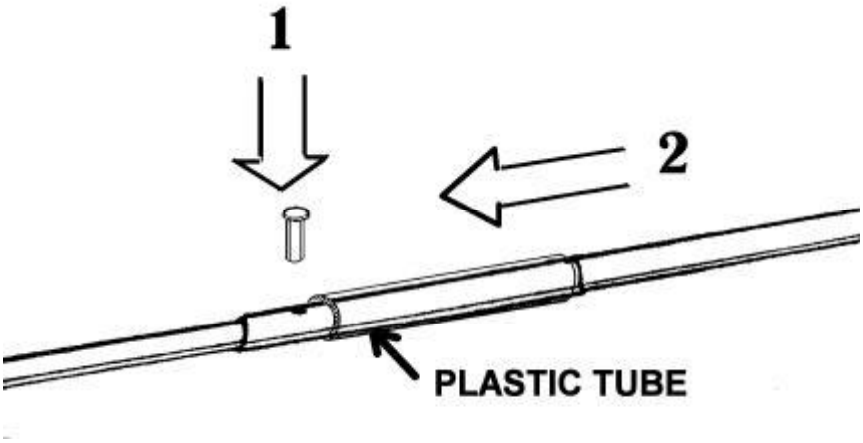


Fig. 21

NOTE: The glider is set up in the 6-metres long condition. The further set up procedure is analogous to one from the bag 6-metres long (section 2.2) except points 2.2.1-2.2.6.

2.2. SET UP PROCEDURE FROM THE PACKAGE 6 METRES LONG

2.2.1. Undo the zipper on the 6 metres bag and remove the battens in the bags, speedbar and the nose cone from the bag (Fig. 22).

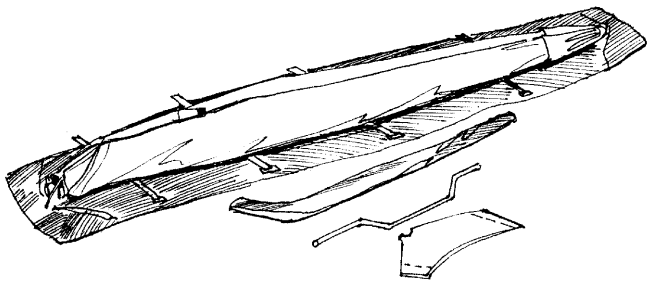


Fig. 22

2.2.2. Remove the safety bag from the downtubes. Spread the downtubes. Install the speedbar so that off-set of the speedbar is directed forward and upwards to the flight direction. Fix each end of the speedbar using the bolt, the wing nut and the safety ring or using quick-pin (see Fig.3).

2.2.3. Rest the glider on the control bar (Fig. 23).

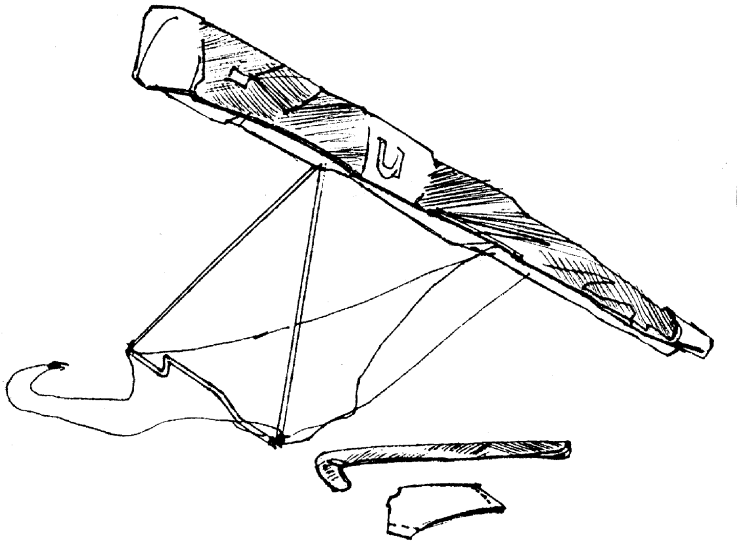


Fig. 23

2.2.4. Remove the bag and the velcro straps. Spread the wings so, that the sail is little sagged and the glider is resting on the consoles and on the keel tube (Fig.24).
NOTE: Take care that the luff lines and the top wires are not wrapped around the keel and are free from the keel hardware.

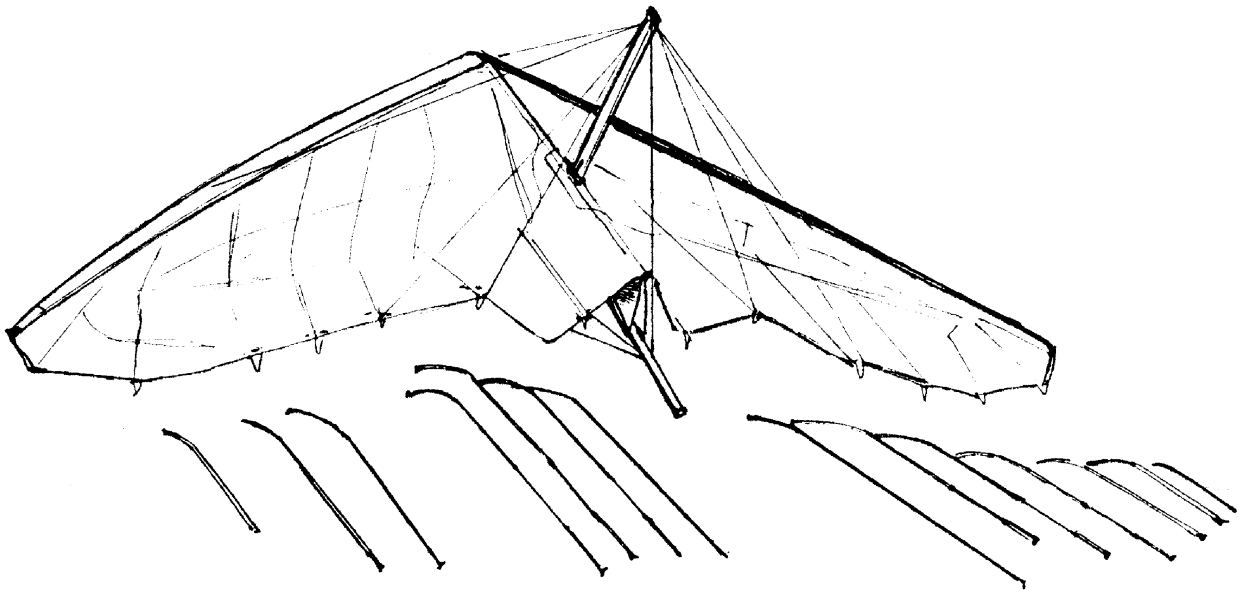


Fig.24

2.2.5. Remove the protective bag from the rear section of the keel tube. Attach the hook of the top rear wire and the luff lines to the thimble of the top front wire (see fig.19). Make sure that the hook for the wires is not inverted and the luff lines are not twisted.

2.2.6. Remove the battens from the bag. Lay them on the ground for each wing separately in decreasing order of length (see fig.24). Insert battens into the battens pockets.
Battens of left and right wings has a marking of different colours or plastic details of different colours.

2.2.7. Secure the rear end of each batten by first looping the bottom loop of leech line around the notched batten end, and then attaching the top loop using the extra loop as a handle (Fig.25,26). Be sure the leech line loops are not caught underneath or wrapped around the luff lines.
Insert the tip battens until they are stopped on the N4 leading edge tubes and fix them using the leech lines.
NOTE: The sail battens must be installed before the crossbar is tensioned, otherwise you will decamber the battens and may ruin the sail.

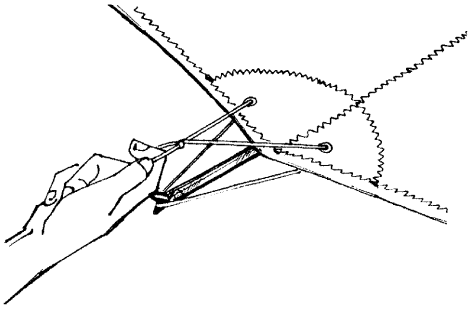


Fig. 25

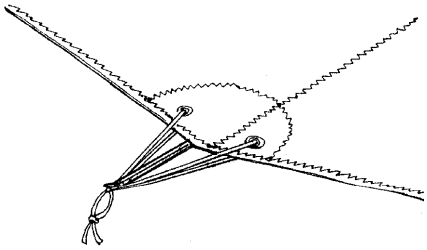


Fig. 26

2.2.8. Spread the wings all the way and check all wires for twisted thimbles or tangs.

2.2.9. Pull the crossbar tensioning wires and put the metal ring of the wires on the hook of the stop detail on the keel tube. Take care that reeded spring closes the metal ring in the hook (Fig.27). Effort on the crossbar tensioning wire should not be big.

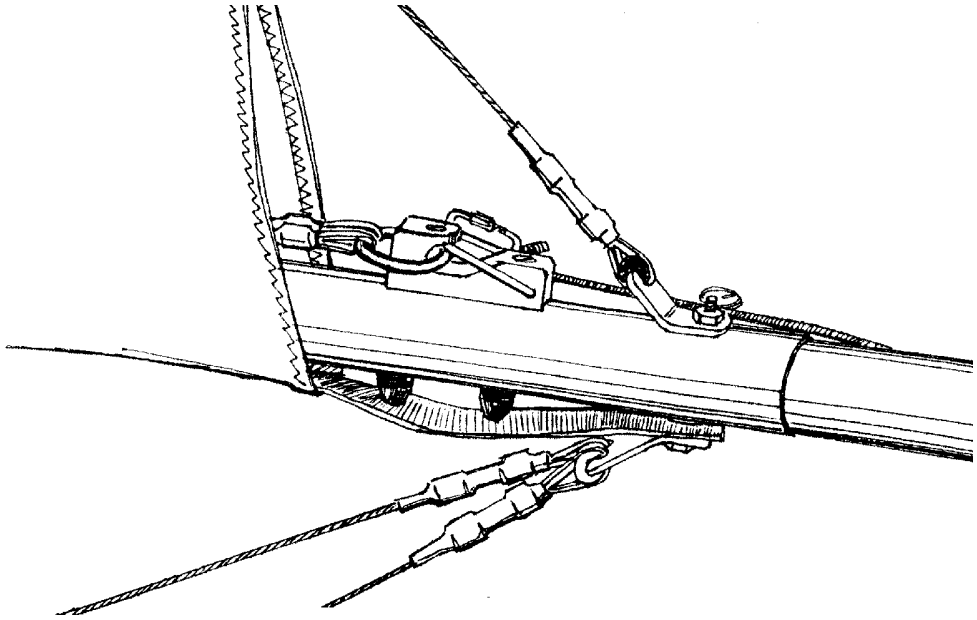


Fig. 27

2.2.10. Secure the lock of the bottom front wires in the channel of the nose assembly by the pin and the safety ring / quick pin (Fig.28). If necessary put the fork of the keel batten on the keel tube.

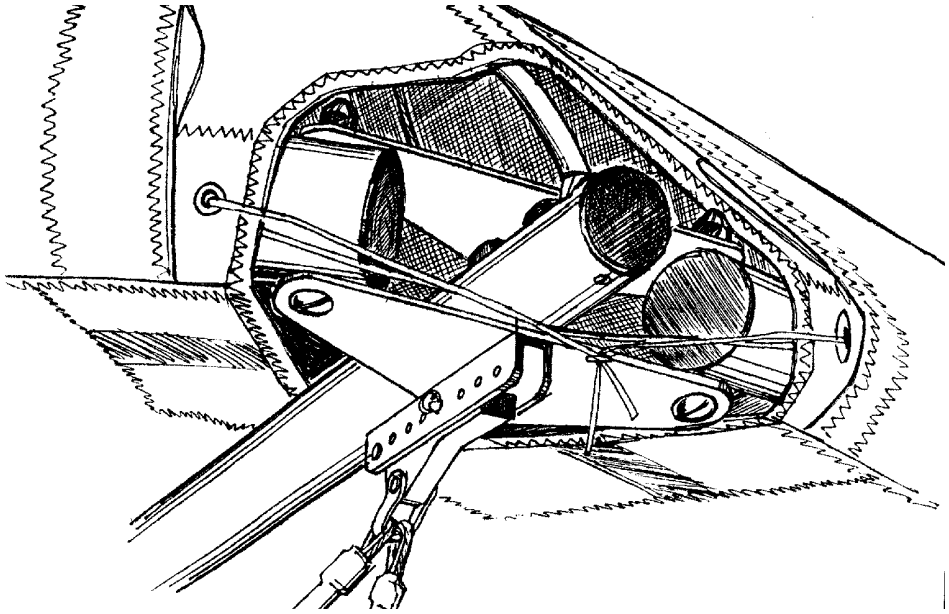


Fig. 28

2.2.11. Fit the nose cone over the front of the keel and attach the velcro at the top rear end of the nose cone (Fig. 29).

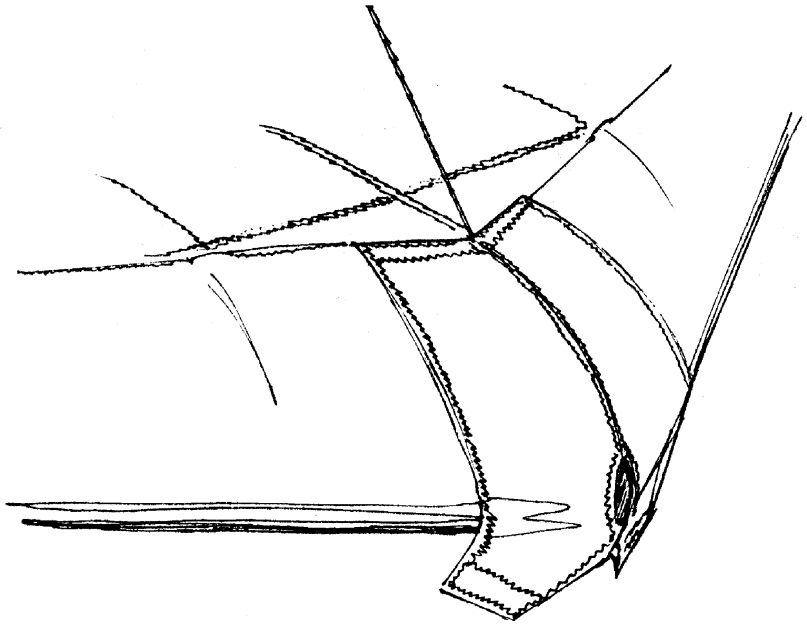


Fig. 29

Rest the glider on it's tail and pull the bottom corners of the nose cone back until the nose cone is tight around the nose and secure the velcro on the bottom of the nose cone to the bottom surface (Fig.30).

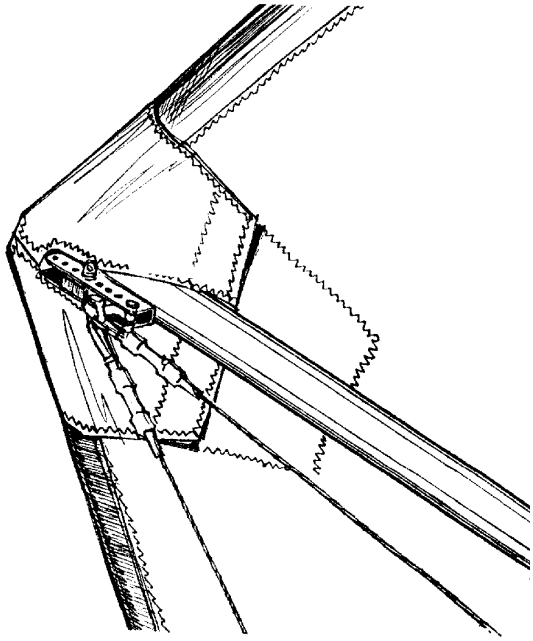


Fig.30

2.2.12. Zip the zippers on the bottom surface near crossbar/leading edge junctions.

2.2.13. Insert washout tips into the corresponding holes in the leading edge tubes N4 (Fig.31).

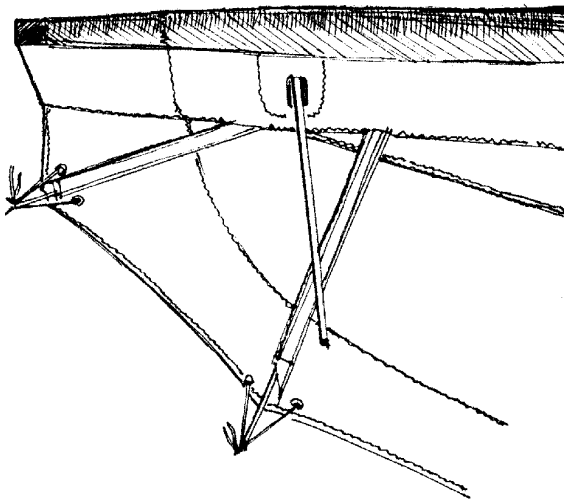


Fig.31

Make a preflight inspection of the glider (section 2.4).

If you don't have enough experience to fly such glider, ask more experience pilot to do this.

2.3. SET UP PROCEDURE FROM THE PACKAGE 4 METRES LONG

2.3.1. Undo the zipper. Remove the velcro straps. Remove the battens in the bags, the speedbar, the nose cone and assembled N3-N4 leading edge tubes (Fig.32).

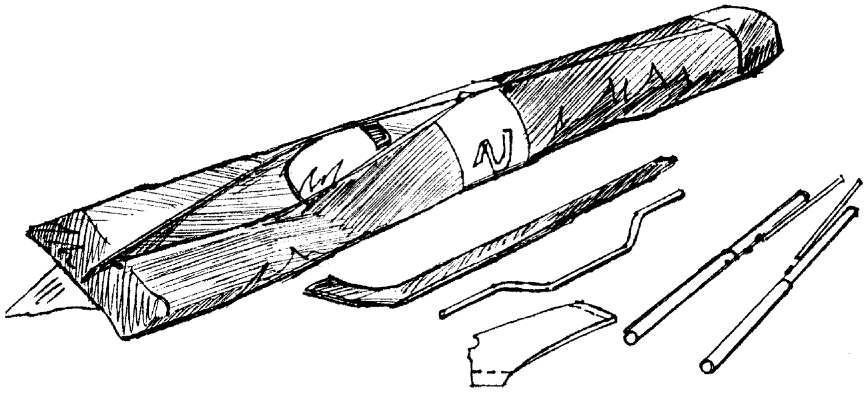


Fig.32

2.3.2. Unfold the free part of the bag. Unfold and spread the sail along the leading edge of the sail. Spread the leading edges slightly. Insert assembled N3-N4 leading edge tubes into the pockets. Attach them to the N2 leading edge tubes according to the marking (marking must be on the top of the tubes). It will be more convenient if you will use holes in the bottom surface near leading edge/crossbar junction.
Insert washout tips into the corresponding holes in the sail.

2.3.3. Pull the sail out completely, put the sail mount webbing in the slot in the endcap.

2.3.4. Then follow the points 2.2.2-2.2.13 of Section 2.2.

2.4. PREFLIGHT INSPECTION OF THE GLIDER

2.4.1. Check that the lock of the bottom front wires is secured by the clevis pin and the safety ring / quick pin.
Keel batten must stay on the keel tube (Fig.33).

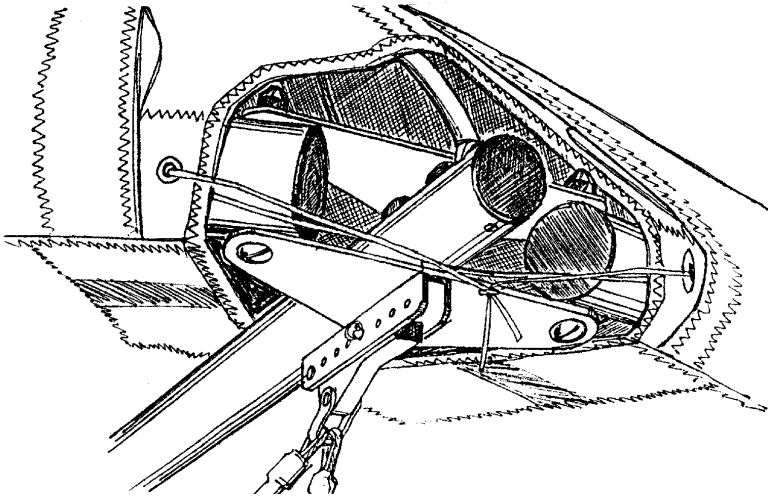


Fig.33

2.4.2. Check that the mylars have no bends.

2.4.3. Look through the open bottom surface pockets near the crossbar/leading edge junction and check that this junction is safely secured with the nut and the safety ring. Check that side wires are attached to the junction properly, that wires are not twisted and are not caught up (Fig.34).
Look through the same hole and inspect each leading edge. Make sure that the spring buttons in the telescopic connectors protrude from the tube surface.
Check for any evidence of dents, deep scratches, cracks or bends in the leading edge tubes (look for signs of crystalization of the material: a brighter, fuzzy spot on the aluminium).
Zip the zipper near the crossbar/leading edge junction.

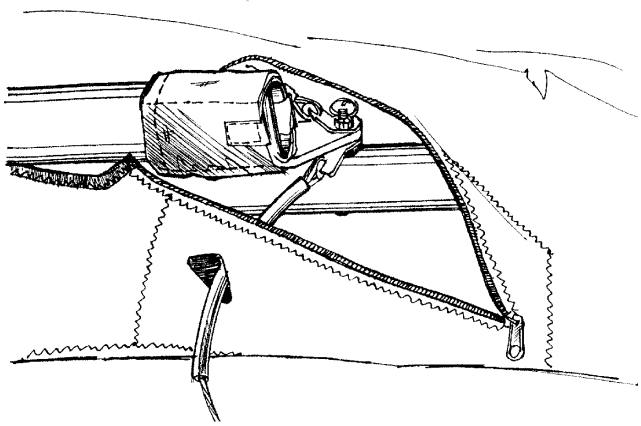


Fig.34

2.4.4. Look into the sail at each wing tip. Check that the tip battens are properly seated and fixed with the leech lines.
Be sure that the sail mount webbing is safely and correctly secured in the end cap slot (Fig.35).
To provide an equal tension to the left and right part of the sail, the mountable sections of the consoles (N4) must be installed symmetrically.

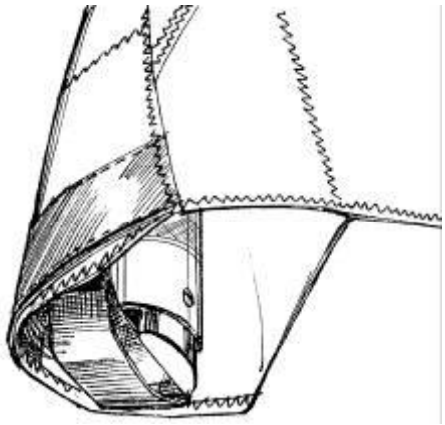


Fig.35

2.4.5. Check the trailing edge for any cuts, tears or broken stitching. Check that the top surface battens are fixed with the batten tension leech lines.

2.4.6. Check that each of the luff lines is free from the batten tension leech lines and the luff line safety ring is flush with the bottom of the sail (Fig.36).
Check that no luff line wire is looped underneath a more inboard batten.

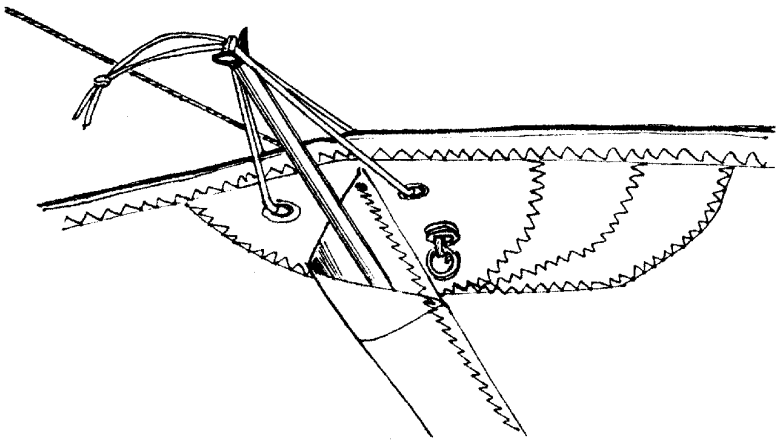


Fig.36

2.4.7. Check that the top rear wire is going properly through the tape loop on the sail and check that this wire, the keel mount webbing and bottom rear wires are safely secured to the N2 keel tube using the bolt, the nut and the safety ring (Fig.37).

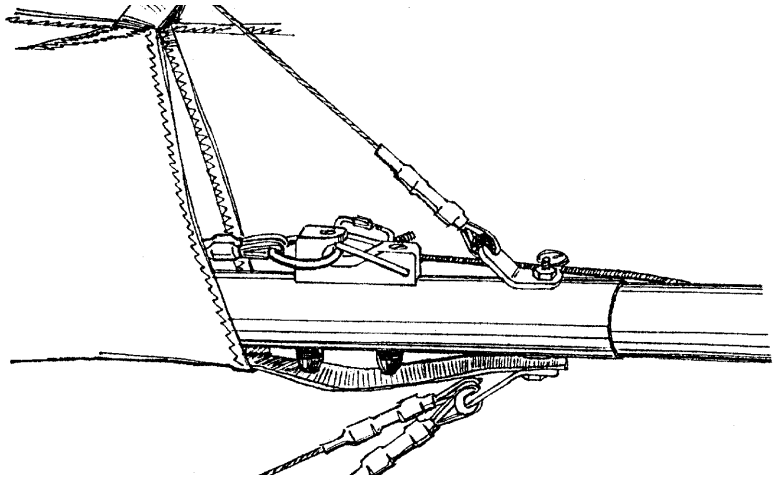


Fig.37

2.4.8. Check that the bolt, the castle nut and the safety ring which secure the downtubes to the channel are secured.

2.4.9. Check the kingpost mounted main and safety hang loops for wear at the kingpost junction, between the kingpost and spreader bar, at the knots, and the hang point.
Check that spreader bar is below the keel tube and back of the uprights (Fig.38).

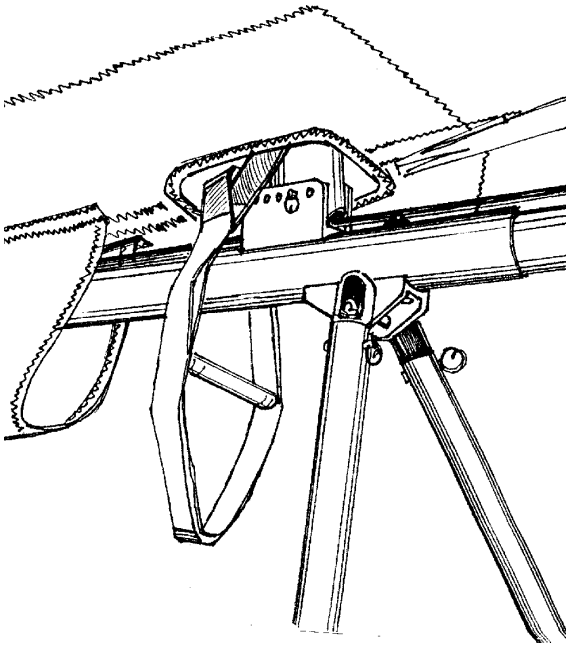


Fig.38

2.4.10. Check that crossbar tensioning wires are secured in the lock on the keel tube and that reeded spring closes metal ring in the hook (See fig.37). Kingpost tensioning wires must go through the kingpost channel and must not be twisted. Maillon with the rubber rope attached must be closed.

2.4.11. Check the thimble fittings at the control bar corners for any cocked or twisted thimbles and tangs. If you find any, detension the crossbar and straighten them out.
NOTE: If you find a kink in the cable, you must replace it, or there is a danger it will fail after repeated loading and unloading.
New wires you may buy from your local dealer or from manufacturer.

Check the selflocked nuts, the wing nuts and the safety rings at the lower control bar corners (Fig.39).

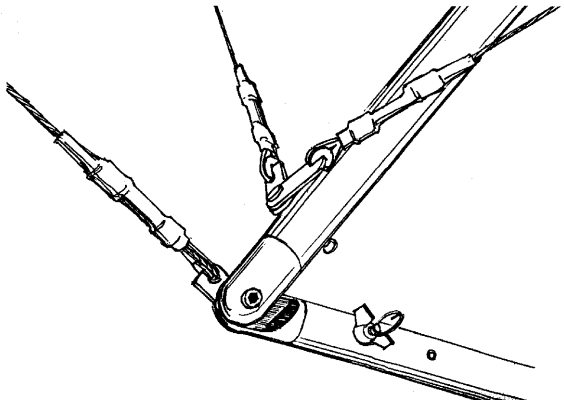


Fig.39

2.4.12. Check that washout tips are secured in the sockets in the leading edge tubes (Fig.40).

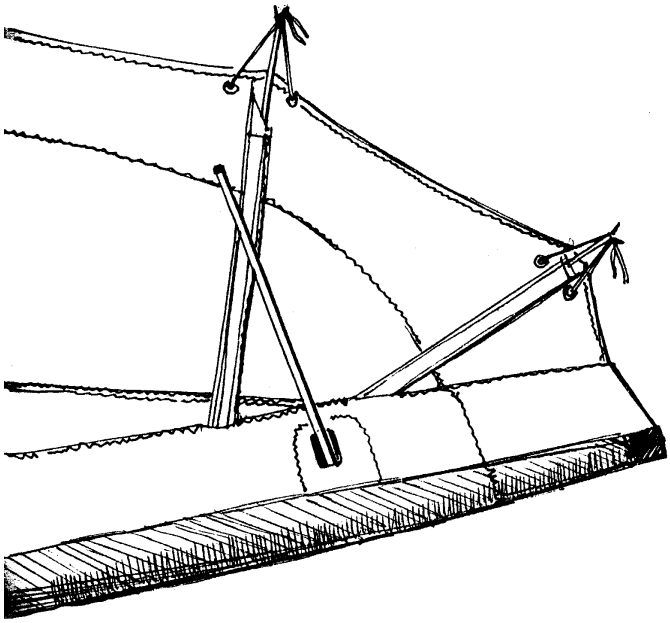


Fig.40

2.4.13. Now the preflight inspection is completed. Attach the nose cone.

2.4.14. Don't fly with bent or kinked downtubes.

2.5. LAYING THE GLIDER FLAT

Once you have the glider set up, you can lay it flat on the ground. If there is more than 8 m/s (18 mph) of wind, however, you should have assistance to do it.

2.5.1. Remove the nose cone from the nose of the glider. Remove the safety ring from the clevis pin which is on the channel of the nose junction. Take away the clevis pin, then disconnect the swan catch of the bottom front wires from the channel while pulling down on the top of the nose.

2.5.2. Lay the glider on the ground nose into the wind. If the wind is more than 8 m/s (18 mph) disattach the hook of the top rear wire, move the kingpost forward and attach the hook to the hole in the sail for the kingpost (Fig.41).

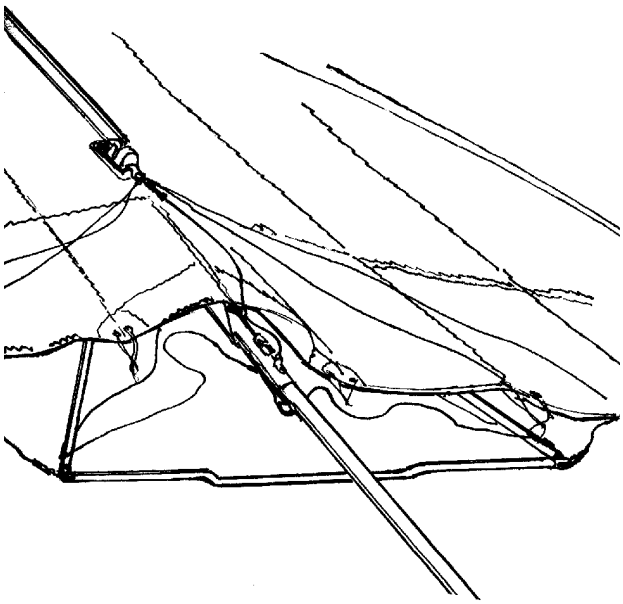


Fig.41

2.5.3. Remove the washout tips from the sockets and fix tips with the velcro.

2.5.4. Remove the ring of the crossbar tensioning wires from the hook on the keel tube and detension the crossbar.

Section 3. PERFORMANCE AND FLIGHT CHARACTERISTICS

3.1. PREPARATION FOR FLIGHT

3.1.1. Lift the glider up if it is laid on the ground. To do this you must perform the procedure reverse to that described in the point 2.5 ("Laying the Glider Flat").

3.1.2. Check and adjust your harness. The best position of pilot is 3 - 4 inches from speedbar. Be sure that no part of the harness touches with the speedbar while pilot moves over the all range of displacements.

3.2. TAKE OFF

Make sure you are hooked in and check your position hanging in the control bar.
If the wind is more than 8 m/s (18 mph) or is gusty, you should have at least one assistant, on the nose wires.
Before you will run the nose of the glider must be slightly elevated, wings level. Check the wind direction. Begin a good aggressive run in to the wind. After some steps you will feel that glider wants to fly, but you have to continue swift run and you will really take off.

3.3. FLIGHT

Make your first flights from a familiar site in mellow conditions.
The trim speed of regulated glider is approximately 28 - 30 km/h (16-18 mph), position of speed bar - before pilots face.
When flying in turbulence you should cruise at a speed just over that of trim. To do this you should hold the basetube between your chin and your chest.
“Target” is controlable at speeds well below that of minimum sink. In this case you will be flying in a partial stall, and you will not be getting your best sink rate.

3.4. TURNING

Perform a smooth turn by the simple side displacement of your body. When the glider begins to turn, decrease the pressure on the control bar and let your body return to the middle of the speedbar. Don't pull the speedbar before the turn if your speed is slightly more than the speed of trim.

3.5. LANDING

Landing should start with a straight final approach into wind.
Keep the wings level, cruise at speed wich just over that of trim and fly the glider right down till you rich the altitude of 1 - 2 m. At this altitude decrease descent rate by

pushing slightly the control bar. Before your feet touch the ground, slow glider until signs of stall become apparent quickly ease the bar out all the way. If you made this procedure correct, air resistance will decrease the speed of glider and you will land safely.
The "Target" lands very easily.

We wish you soft landings !

Section 4. B R E A K D O W N

Breakdown of the "Target" is simply the reverse of the set up procedure. While performing the breakdown leave the quick-mountable fasteners on one of the components of the frame.

4.1. BREAKDOWN INTO THE PACKAGE 6 METRES LONG

4.1.1. Detach the nose cone.

4.1.2. Remove the washout tips and attach them by velcro (Fig.42).

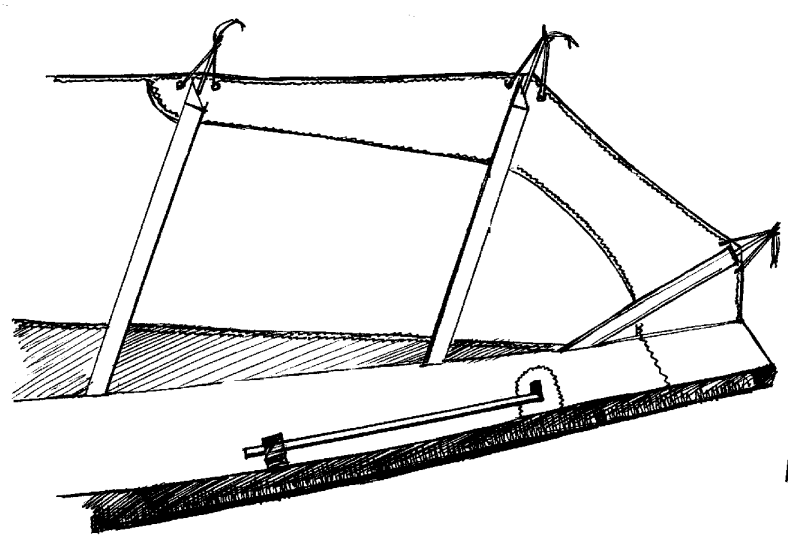


Fig.42

4.1.3. Rest the glider on the control bar and the tail. Undo the lock of the bottom front wires.

4.1.4. Tension slightly the crossbar sweep wires by your hand and remove the ring of these wires from the hook on the keel tube.

4.1.5. Pull in the wings slightly and remove all battens. Put the battens into the bags. Fit the tip bags over the wing tips.

4.1.6. Detach the hook of the top rear wire from the kingpost and attach it to the kingpost hole in the sail. Move the kingpost down. Fit the protective bag over the keel tube/rear wires junction (Fig.43).

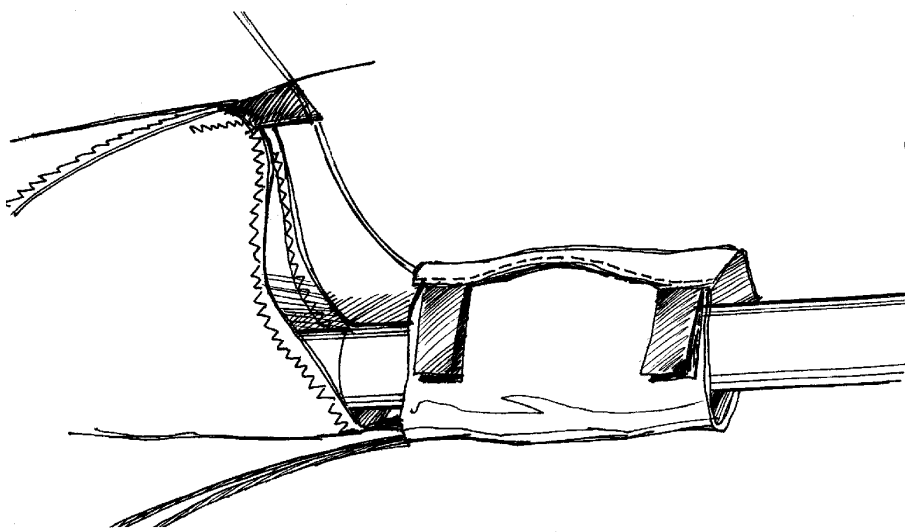


Fig.43

4.1.7. Fold the wings. Spread the sail so that both the top and bottom surfaces of the sail are equally taut, roll the sail and place it along the leading edge (Fig.44). Place the bags with the battens between the leading edges of the sail at the glider nose. Fix the sail with the tighten tapes. Put the nose cone under the tighten tape nearest to the nose (Fig.45).

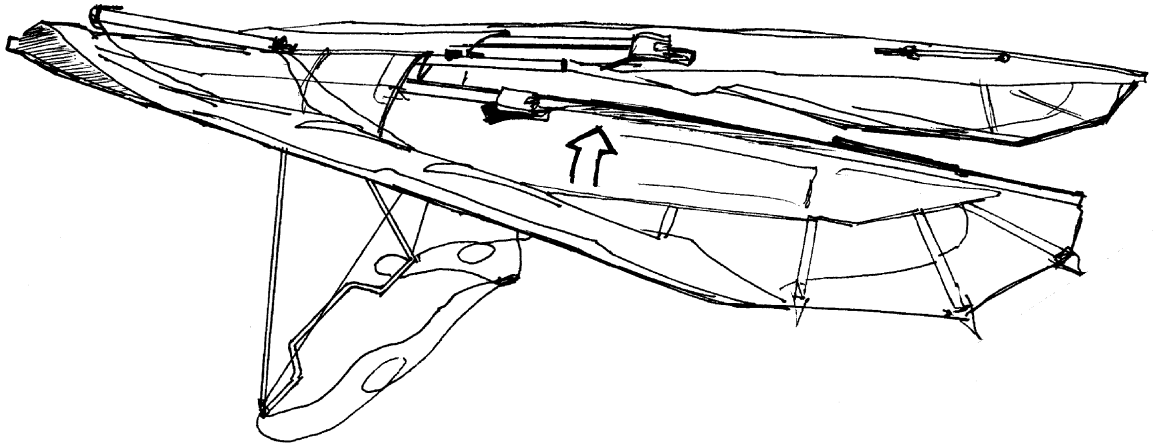


Fig.44

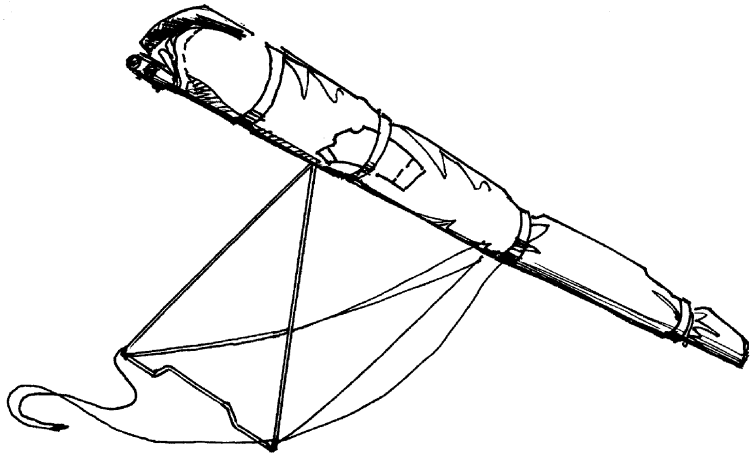


Fig.45

4.1.8. Fit the bag over the glider (from the top) and lay the glider in the bag on the ground. Detach the speedbar and place it between the leading edges.

4.1.9. Place the spreader bar of the hang loop between the uprights. Cover the control bar/keel tube junction by a protective padding (Fig.46). Bring all wires forward alone tubes and place uprights inside the folded sail. Zip the zipper.

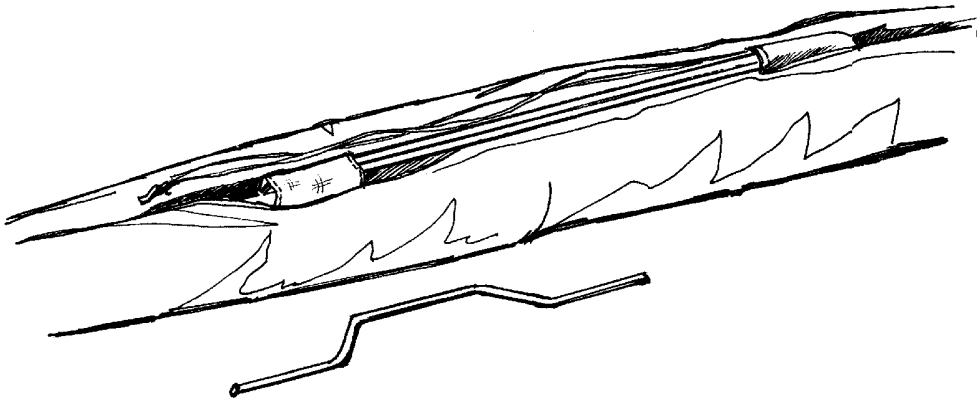


Fig. 46

4.2. BREAKDOWN INTO THE PACKAGE 4 METRES LONG

4.2.1. Perform the procedure as described in the paragraph 4.1, except last point.

4.2.2. Remove the sail mount webbing from the leading edges end caps. Detach the consoles.

4.2.3. Place the leading edge of the sail over the other one and bend the sail to the nose (Fig.47). Attach it by a tighten tape in the direction the mylar wants to fold.

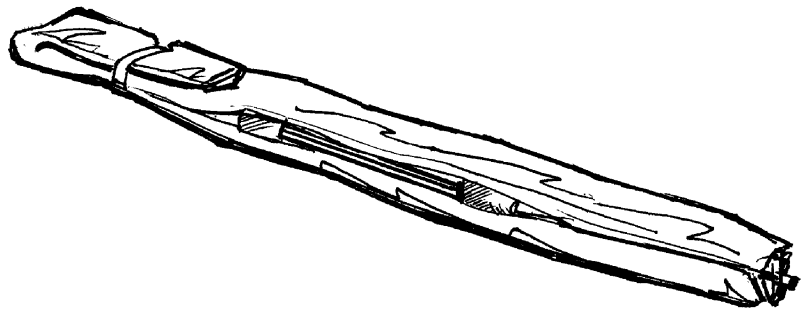


Fig.47

4.2.4. Place the consols into the bag. Zip the zipper. Tuck the excess of the bag into the package (Fig.48).

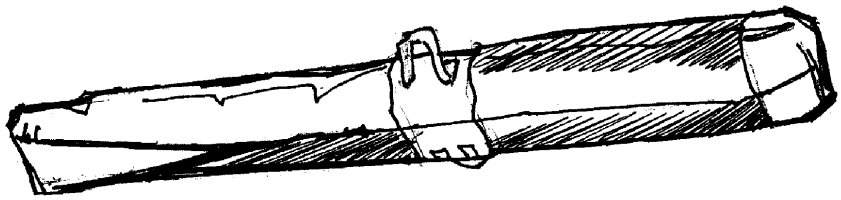


Fig.48

4.3. BREAKDOWN INTO THE PACKAGE 2 METRES LONG

While performing the breakdown leave the quick - mountable fasteners on one of the components of the frame (best of all - on the wires).

4.3.1. Perform the procedures according to the points 4.1.1. - 4.1.4.

4.3.2. Detach the maillon of the rubber rope from the crossbar tensioning wires.

4.3.3. Disconnect the luff-lines wires from the sail. Roll them in a coil.

4.3.4. Lay the glider on the ground and pull in the wings slightly.

4.3.5. Remove the sail mount webbing from the leading edge end caps.

4.3.6. Undo the zippers on the bottom surface and dismount the crossbar/leading edge junction. Remove the ends of the top and bottom wires from the sail.

4.3.7. Remove the keel batten and the top front wire from the sail.

4.3.8. Detach the top rear wire, the keel pocket mount webbing and bottom rear wires from the keel tube.

4.3.9. Detach the keel tube N2.

4.3.10. Detach the kingpost from the kingpost channel and remove the hang loop from the sail.

4.3.11. Pull the sail slightly to the nose and remove the nose restraint.

4.3.12. Remove the sail from the frame.
NOTE: When you feel a resistance, stop and find the obstacles.

4.3.13. If you need it remove the mylar from the leading edge pockets.

4.3.14. Pack up the sail along the leading edge of the sail. Try to do this without longitudinal folds on the leading edge of the sail.

4.3.15. Place the sail into the bag and zip the zipper.

4.3.16. Detach the speedbar. Pull the downtubes in.

4.3.17. Detach the N2, N3 and N4 leading edge tubes.

4.3.18. Detach the N2 crossbar tubes.

4.3.19. Disassamble the long battens. For this slide plastic tubing and remove pins from the battens NN 1 and 2.

4.3.20. Detach the downtubes from the keel channel, put the wires along the downtubes and place the hang loop spacer around the bottom ends of the uprights.

4.3.21. Put two tighten tapes on the bag with the sail, then put two tapes around all tubes, battens, kingpost and speedbar trying to decrease the dimensions of the package. Control that details of the frame do not make local damages of the sail. Use additional washers if necessary. Tighten the package with the tapes (Fig.49).

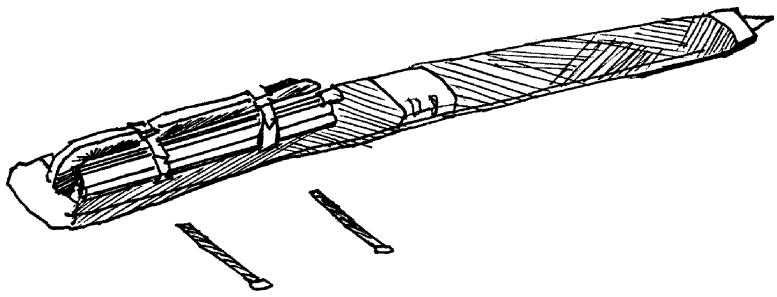


Fig.49

4.3.22. Fold the bag with the sail so that it will cover the tubes from the top. Fold the free end of the bag inside. Tighten the package with the tapes (Fig.50).

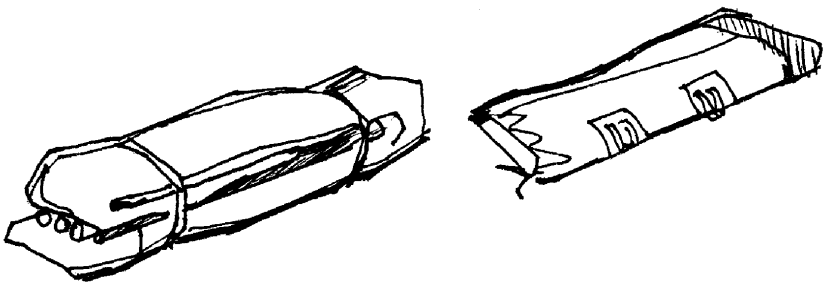


Fig.50

4.3.23. Fit the short (shipping) bag over the package and tighten the bag lace.
The glider is packed and ready for shipping.

NOTE: WE DON'T RECOMMEND TO PUT THE PACKAGE VERTICALLY, BECAUSE IN SUCH CASE TUBES MAY DESTROY THE SAIL.

Section 5. M A I N T E N A N C E

5.1. TUNING

Properly tuned, the glider is comfortable, well controllable and safe in all permissible flight modes.
All hang gliders “TARGET” are tested and tuned by the manufacturer or dealers. But you may tune the glider by yourself, using variable kinds of tuning described in this manual, if your experience permits. Anyway you should familiarize yourself with the description of tuning. There are a number of things on glider that are adjustable and affect the flight characteristics. Don't change more than one adjustment each time other wise - you should not be able to understand what adjustment influenced the glider.
IF YOU DON'T HAVE ENOUGH EXPERIENCE TO TEST HANGGLIDER, ASK MORE EXPERIENCE PILOT TO HELP YOU.
Test the retuned glider from a familiar site in mellow conditions.

5.1.1. BATTENS

The battens will need to be trued to the template from time to time. Small variations* in batten camber will not have a significant effect on flight characteristics. Battens which are assymetric from left to right (especially on the wing tips) will tend to induce a turn during the flight.
(* +/- 2 cm at trailing edge)

5.1.2. THE BATTEN TENSION

The batten tension must ensure the effort of nearly 2-3 kg on the loop of the batten tension leech line. If the leech line is too loose, especially on the wing tip battens, there may appear a flutter on the trailing edge. If the luff line is too tight - the handling of the glider may be more hard. Take care that the luff lines of both left and right wings are tightened symmetrically.

5.1.3. SAIL TENSION

The flight characteristics of the glider depend on the sail tension substantially. If the sail is mounted too tightly, the glider will be "stiff", hard to turn, with a tendency to adverse yaw on turn, especially at low speeds. If the sail is too loose, the handling will feel mushy and disconnected, the glider will not perform as well as it should. But the glider with loose sail is better for first runs and small flights.
The sail tension is adjustable by the different installation of the leading edge tubes N4. Leading edge tubes N4 has 2 holes permitting to change the console length.
Symmetrical leading edge sail tension is important for proper turn trim. The glider with a sail mounted assymetrically on the leading edges will normally have a turn towards the looser wing. The sail will stretch over operation time, so a new sail which is properly tensioned will eventually become too loose. When you feel that speed and

glide characteristics of the glider become worse, retension the sail. But remember that too tight sail makes the handling more hard. The sail assymetry may be caused by the assymetry of the left-wing and right wing battens and by the bent tubes. Repair the fault.

5.1.4. CONSOLE CAP ALLIGNMENT

If the assymetry is not eliminated by above methods, change angles of the console caps. To do this remove self taping screws and turn the console caps in opposite directions. If the glider has a left turn during the flight - turn the left plug to the decrease wing geometric twist and right plug - to the increase wing geometric twist. The installation angle should be chosen according to the degree of assymetry, but not more than 45 degrees from the normal position. Fix the cap in the chosen position using the screws.

5.1.5. HANG POINT POSITION ADJUSTMENT

Trim speed of the glider must be approximately 28 - 30 km/h (18 - 19 mph), at this speed control bar position is in front of the pilots face.
If the control bar wants to go forward - trim speed is too small. Move the kingpost to the next forward hole in the kingpost channel. If the control bar goes backward, the sink rate increases and the handling becomes more heavy - the trim speed is too big. Move the kingpost to the next backward hole in the kingpost channel.
You must find a position of the kingpost at which the trim speed is slightly more than the speed of minimum sink rate. At this speed glider flies stable and handling is easy.
Weight of pilot influences on the necessary position of the kingpost. If the glider is tuned for the pilot of 90 kg of weight, so for the pilot of 60 kg it's necessary to more the kingpost at least one position backwards.

5.2. PERIODICAL INSPECTION

You must make an inspection of the glider:

- prior to beginning flight;
- any time you suffer a hard landing to find a possible deformation of the frame;
- every 3 months or 50 hours of airtime whichever comes sooner.

Periodical inspection includes the inspection of sail and frame which requires the complete breakdown procedure. Inspect all tubes for any residual deformations, dents, signs of corrosion or cracking, especially around bolt holes and sleeve ends. Inspect all wires for broken strands, kinks, corrosion etc. Inspect main and safety pilot straps for wear and replace it if any wear is indicated.
Inspect the sail carefully (especially after hard or tree landing !) for tears and broken stitching, especially along the trailing edge, kingpost hole, the keel section stitches and the sail mount webbing attachment point at the wing tips. Compare batten profiles with the template. The template must be placed on a flat surface. True the battens to the

template, if there are the divergences. Have any discovered defects repaired. Replace broken details using the spares, if the repair is impossible. Go to the manufacturer or our dealers, if there are no necessary spares.

5.3. MAINTENANCE

With correct maintenance your glider will be in a good condition for many years.
We recommend that do you not expose your glider to any more solar radiation than necessary, do not leave it set up for long periods of time in the sun when you are not flying it.
Do not leave your glider on the control bar for a long time when the wind is strong. It will decrease the life of your sail.
After raining or any time your glider gets wet you should dry it thoroughly.
Your sail should never be washed in anything other than fresh water, as any soap or detergent will likely degrade the cloth and may adversely affect the flight characteristics.
If you set up or break down your glider take care not to allow sand, soil and dirt to enter your sail, batten pockets or tubes. Keep thoroughly clean the telescopic connectors, as their dirtying will make the set up or break down difficult or impossible. Swab the tubes with a rag.

5.4. STORAGE

You must store the glider in the bag in a dry room on soft bedding. You may store frame without sail in a 2 metres bag vertically. Before storage dry the sail.
Frame of the glider must not be under load during storage, tubes must not be bent under their own weight.
Range of temperatures for storage - from -10?C to +25?C.

5.5. TRANSPORTATION

You may carry your glider in a bag by any kind of transport, which protects from mechanical damage, soiling and long exposure to rain. It is not desirable to carry the glider without the bag.

Section 6. S A I L H E I G H T M E A S U R E M E N T

The following procedure is to enable a check of your gliders' sail reflex.
Should you wish to check it proceed as follows:
1) rig glider on level ground ready for flight;

2) tie glider from nose plate to bring keel level;
3) run 10lb fishing line from each pair of luff lines. Draw tight. Measure and record distance between line and top of keel tube.

Ensure the line runs cleanly from the upper surface of luffline sail grommets.
See figs 51 & 52.
Fig. 51 shows the minimum distances permissible.
If recorded distances are less than those of Fig.51 the glider should not be flown until re-adjusted as follows.
A) if minimum distances are exceeded shim appropriate pair of luff lines using 1 mm washers.
B) if more than 5 mm adjustment per side is required consult your dealer.

The range of permissible sail heights for your glider are recorded in table (A).

Table A

	AEROS TARGET 16	**AEROS TARGET 13**
Batten number	Permissible range of sail heights above keel tube	
2	(335 mm - 355 mm)	
3	(386 mm - 406 mm)	

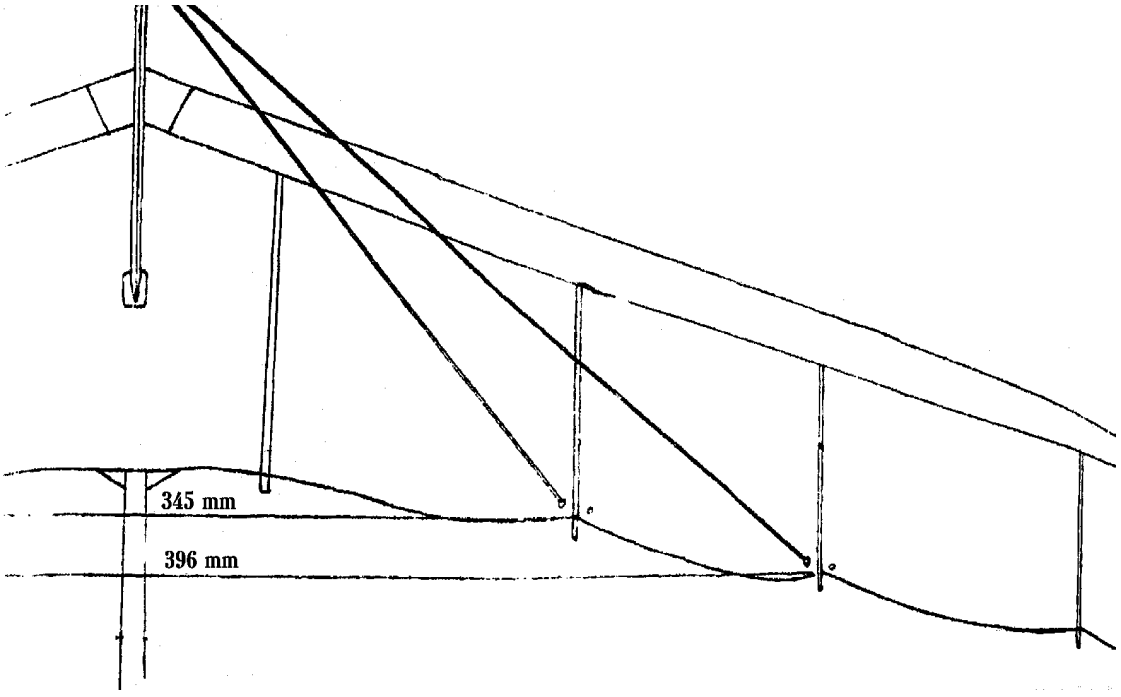


Fig. 51

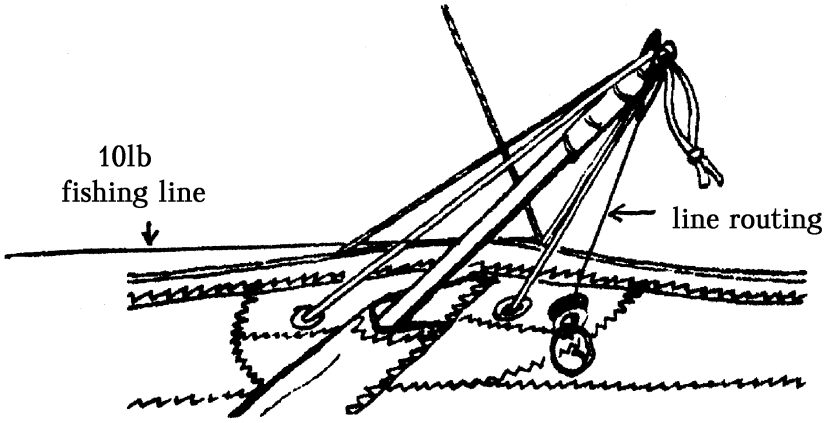


Fig.52

Section 7. OWNERS NOTES

Section 8. L I S T O F S P A R E P A R T S

HANG GLIDER TARGET 13 / 16.
List of repair parts.

For Target 16	For Target 13	Parts
Std.1000	**T13.1000**	**Sail + mylar + nose cone**
Std.0100	T13.0100	Sail
Std.0101	T13.0101	Nose cone
Std.0110	T13.0110	Mylar
Std.2000	**T13.2000**	**All battens**
Std.0201	T13.0201	Batten N1
Std.0202	T13.0202	Batten N2
Std.0203	T13.0203	Batten N3
Std.0204	T13.0204	Batten N4
Std.0205	T13.0205	Batten N5
Std.0206	----------	Batten N6
Std.0211	T13.0211	Tip batten
Std.0220	T13.0220	Keel batten
Std.0231	Std.0231	Shovel of top battens
Std.0232	Std.0232	Shovel of keel batten
Std.0233	Std.0233	Fork of top battens
Std.0234	Std.0234	Fork of tip & keel battens
Std.0300	**T13.0300**	**Leading edge tube**
Std.0310	T13.0310	Leading edge tube N1
Std.0320	T13.0320	Leading edge tube N2
Std.0330	T13.0330	Leading edge tube N3
Std.0340	T13.0340	Leading edge tube N4 + washout tip
Std.0344/V	T13.0344/V	Washout tip (V – with velcro)
Std.0342/M	Std.0342/M	Tip batten stop detail (M – metal)
Std.0343	Std.0343	Console cap
Std.3500p	**T13.3500p**	**Complete crossbar (painted)**
Std.3500	T13.3500	Complete crossbar
Std.0370p	T13.0370p	L or R crossbar tubes (painted)
Std.0370	T13.0370	L or R crossbar tubes
Std.3710p	Std.3710p	Crossbar tube N1 (painted)
Std.3710	Std.3710	Crossbar tube N1
Std.3720p	T13.3720p	Crossbar tube N2 (painted)
Std.3720	T13.3720	Crossbar tube N2
Std.0352	Std.0352	Plastic washer 6 mm thick
Std.0353	Std.0353	Fluoroplastic washer
Std.0365	Std.0365	Tape L = 120 mm
Std.0361	Std.0361	Plate 5 mm thick

Std.0362	Std.0362	Plate 3 mm thick
Std.3400p	**T13.3400p**	**Complete keel tube (painted)**
Std.3400	T13.3400	Complete keel tube
Std.0400p	T13.0400p	Keel tube without details (painted)
Std.0400	T13.0400	Keel tube without details
Std.0410p	T13.0410p	Keel tube N1 (painted)
Std.0410	T13.0410	Keel tube N1
Std.0430p	T13.0430p	Keel tube N2 (painted)
Std.0430	T13.0430	Keel tube N2
Std.0431	Std.0431	Keel tube's hook
Std.0432	Std.0432	Quick link
Std.0415 / B	Std.0415 / B	Nose plate, B – bottom
Std.0416	Std.0416	Nose channel
Std.0424	Std.0424	Control bar channel
Std.0425	Std.0425	Kingpost channel
Std.0450p	**Std.0450p**	**Kingpost (painted)**
Std.0450	Std.0450	Kingpost
Std.0460	Std.0460	Hang strap
Std.0452 / W	Std.0452 / W	Kingpost cap (W – from Finsterwalder)
Std.0453 / W	Std.0453 / W	Cap cover (W – Finsterwalder)
Std.0501p	**Std.0501p**	**Upright tube L = 1550 mm (painted)**
Std.0501	Std.0501	Upright tube L = 1550 mm
Std.0502	Std.0502	Top of the upright
Std.0503	Std.0503	Bottom of the upright
Std.0503-2	Std.0503-2	Bottom of the upright (variant 2)
Std.0553Wp	**Std.0553Wp**	**Speedbar with inner wire (painted)**
Std.0550Ep	Std.0550Ep	Complete speedbar without inner wire (painted)
Std.0553	Std.0553	Speedbar tube
Std.0553S	Std.0553S	Base bar (stright tube)
Std.0551	Std.0551	Speedbar fastening
Std.0551-2	Std.0551-2	Speedbar fastening (variant 2)
Std.0554	Std.0554	Rubber grip (L=280 mm)
Std.0559	Std.0559	Speedbar Quick Pin
Std. / N	T13. / N	NOTE: letter N - non-corrosive wire
Std.0600 / N	T13.0600 / N	Crossbar sweep wires
Std.0610 / N	T13.0610 / N	Bottom side wire
Std.0610 / N-2	T13.0610 / N-2	Bottom side wire (variant 2)
Std.0620 / N	T13.0620 / N	Bottom front wire
Std.0630 / N	T13.0630 / N	Bottom rear wires
Std.0640 / N	T13.0640 / N	Top side wire
Std.0650 / N	T13.0650 / N	Top front wire
Std.0660 / N	T13.0660 / N	Top rear wire + reflex wires

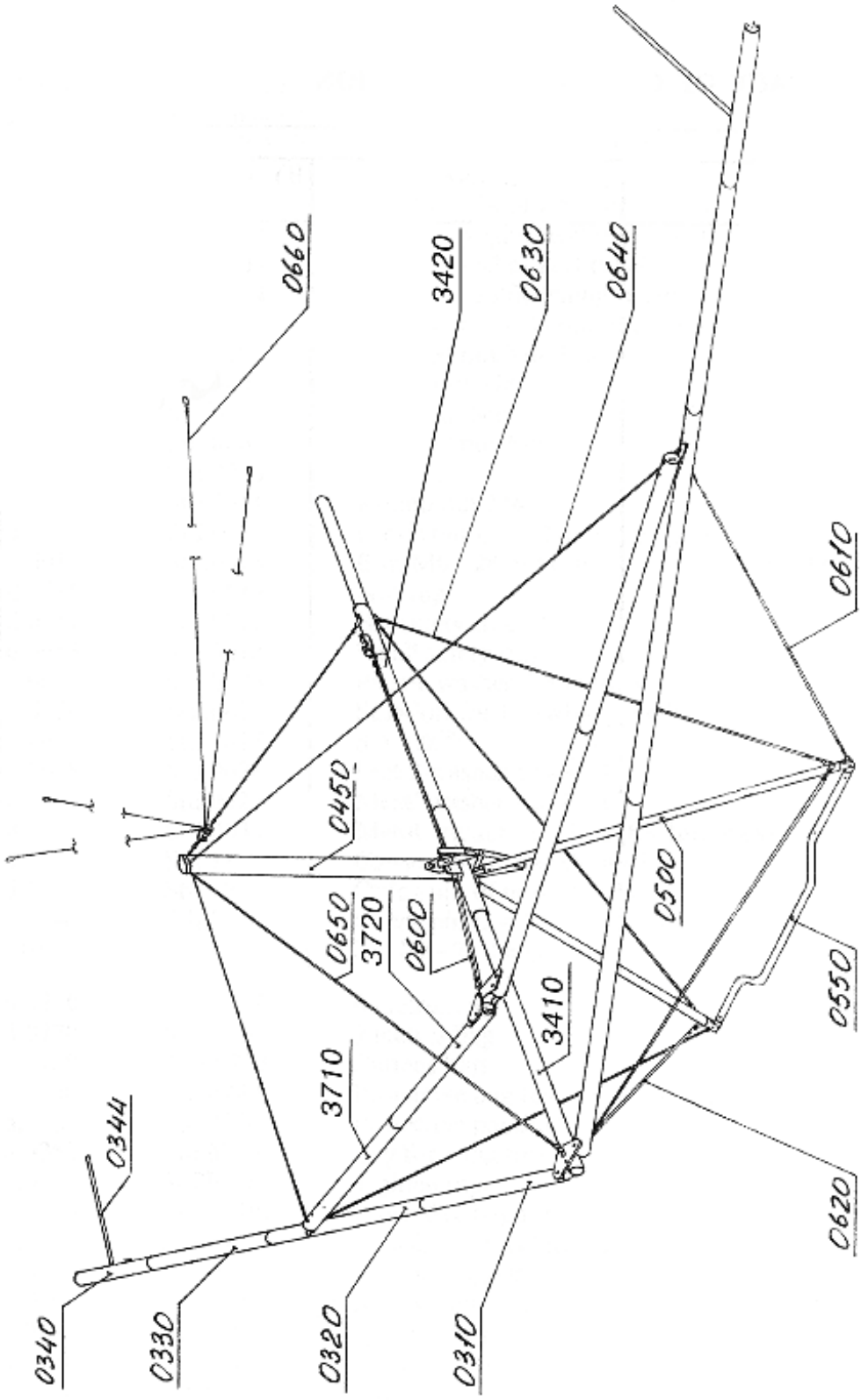
Std.0001	Std.0001	Bolt M8 - 74 of LE/X-bar junction
Std.0002W	Std.0002W	Bolt of uprights/keel tube junction
Std.0003	Std.0003	Bolt M6 - 62 of keel tube/rear wires junction
Std.0005	Std.0005	Clevis pin L = 36 mm (kingpost channel)
Std.0006	Std.0006	Selffixed nut M6 (low)
Std.0007	Std.0007	Castle nut M8
Std.0009	Std.0009	Selffixed nut M6
Std.0010	Std.0010	Nut M6
Std.0011N	Std.0011N	Round nut M8
Std.0012	Std.0012	Clevis pin L = 32 mm (uprights)
Std.0013	Std.0013	Bolt M6 - 28 of bottom side wire/control bar
Std.0015	Std.0015	Bolt M6 – 40 of bottom wires/uprights
Std.0017	Std.0017	Big safety ring
Std.0018	Std.0018	Small safety ring
Std.0025	Std.0025	Plastic washer 3 mm thick
Std.0026	Std.0026	Standoff for LE/Xbar junction
Std.0027	Std.0027	Standoff
Std.0028	Std.0028	Metal washer 10 - 6 - 1
Std.0029	Std.0029	Metal washer 12 - 8 - 1
Std.0030	Std.0030	Metal washer 11 - 4 - 2 (for luff lines)
Std.0559	Std.0559	Quick Pin of speedbar
Std.11	Std.11	Clevis pin of nose channel
Std.12	Std.12	Quick pin of nose channel
----------	Sth.31	Clevis pin L = 50 mm (LE3 + LE4)
Std.83W	Std.83W	Bolt M6 - 43 (hang strap)

Std.0710	T13.0710	6 metres bag
Std.0720	Std.0720	2 metres bag
Std.0730	T13.0730	Battens bag
Std.0740	Std.0740	Protective bag for the bottom of uprights
Std.0750	Std.0750	Protective padding
Std.0755	Std.0755	Bag for wing tips
Std.0760	Std.0760	Tighten tape
Std.0770	Std.0770	Protective bag for crossbar end
Std.0771	Std.0771	Crossbar central junction bag
Std.0775	Std.0775	Top of kingpost
Std.0790	Std.0790	Rear wire/keel junction
Std.0795	Std.0795	Speedbar bag
Std.0800	T13.0800	Battens template
Std.0810	Std.0810	Manual

Section 9. PAGE OF CHANGE AND ADDITION

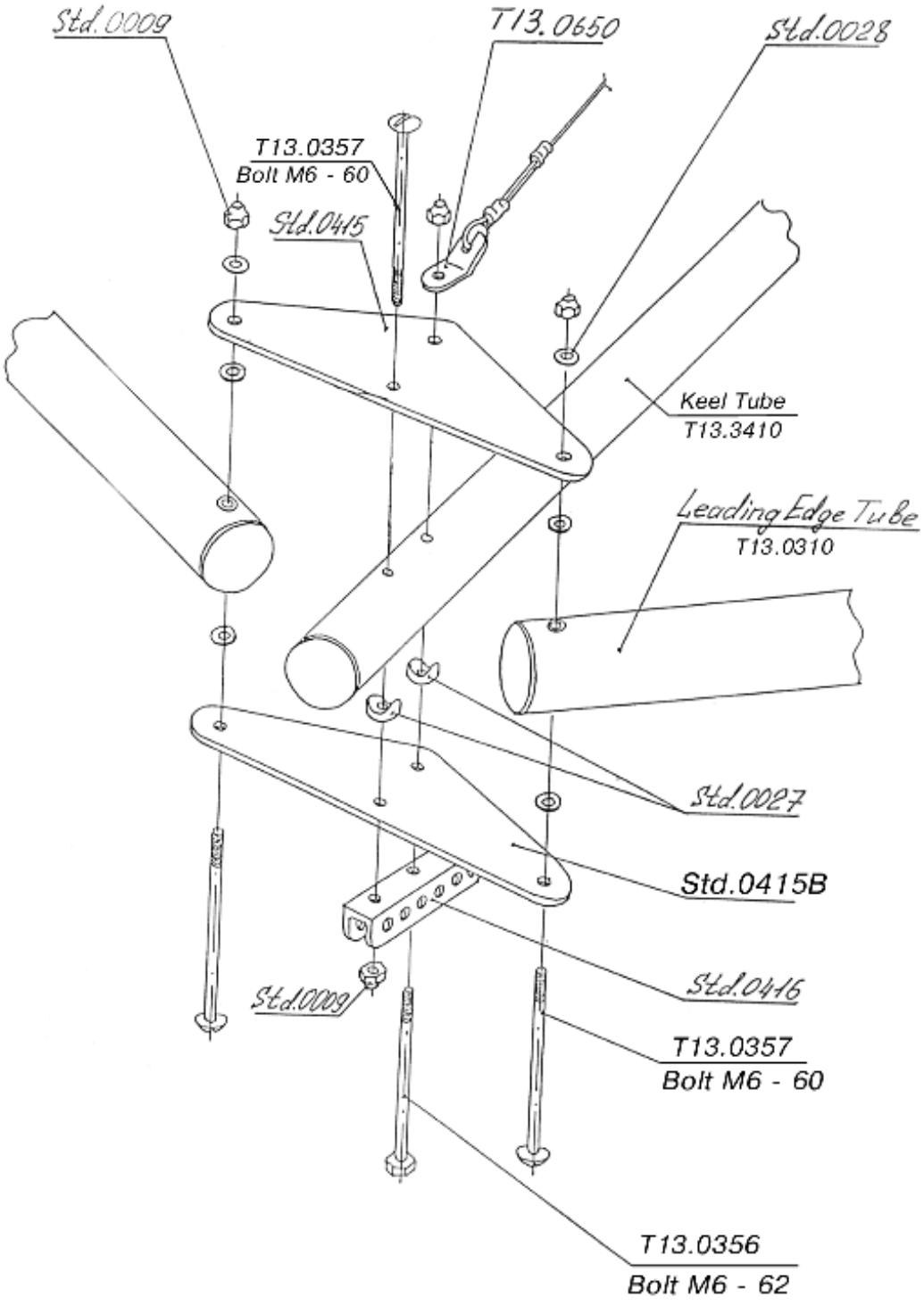
DATE	WORK DONE	BY WHOM

??????



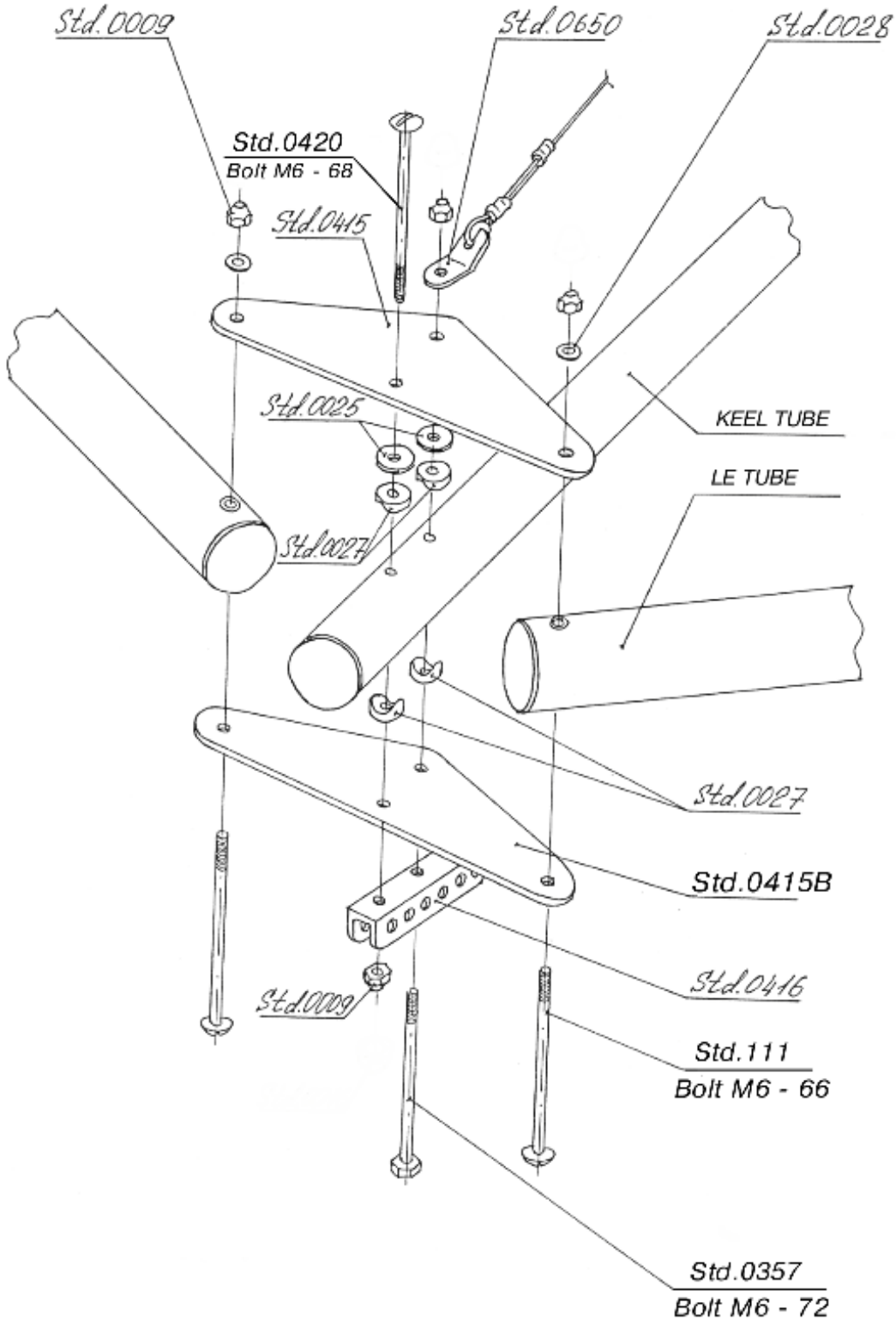
FRAME
OF HANG GLIDER "TARGET"

??????



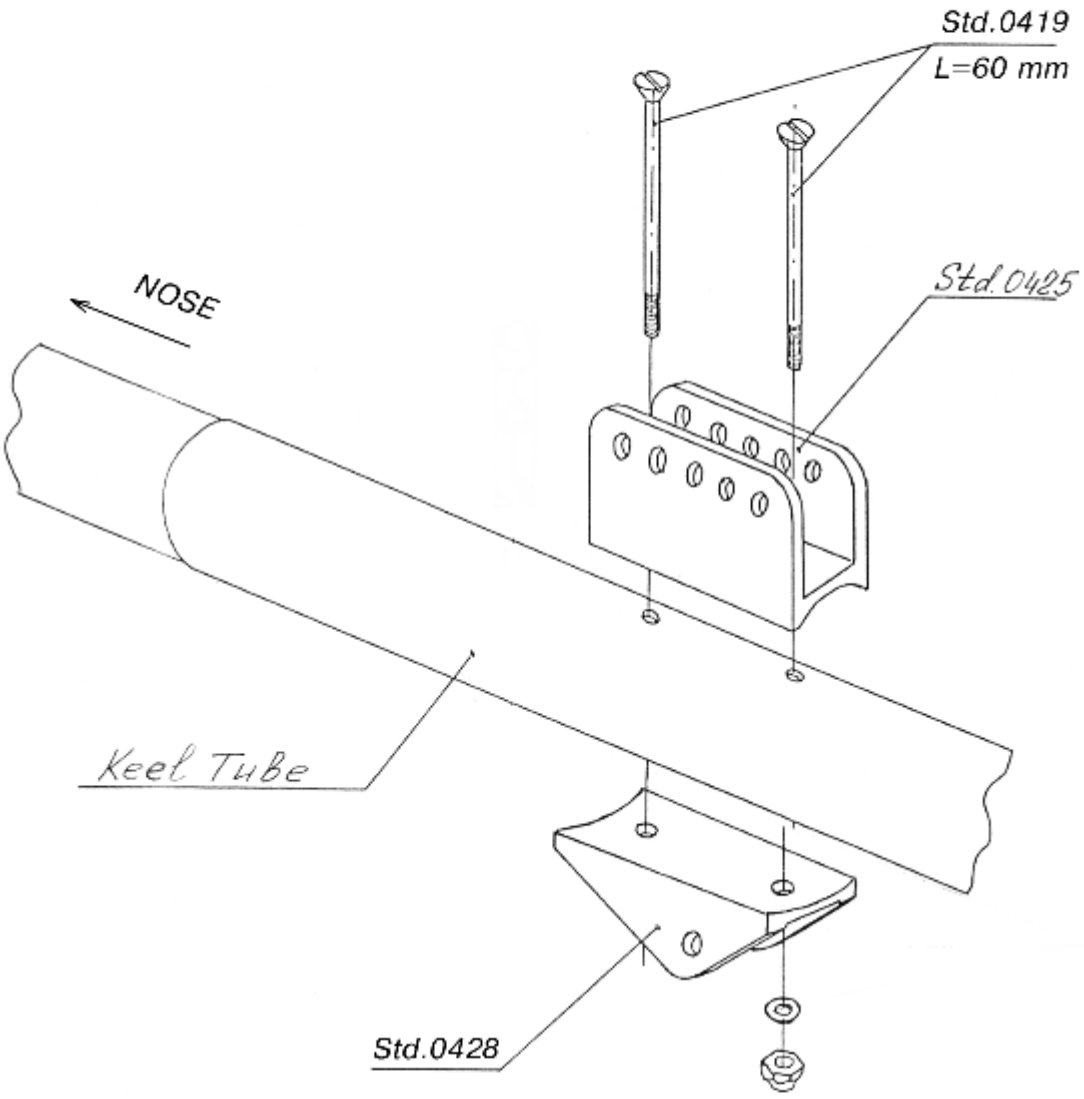
NOSE JUNCTION
OF HANG GLIDER "TARGET 13"

??????

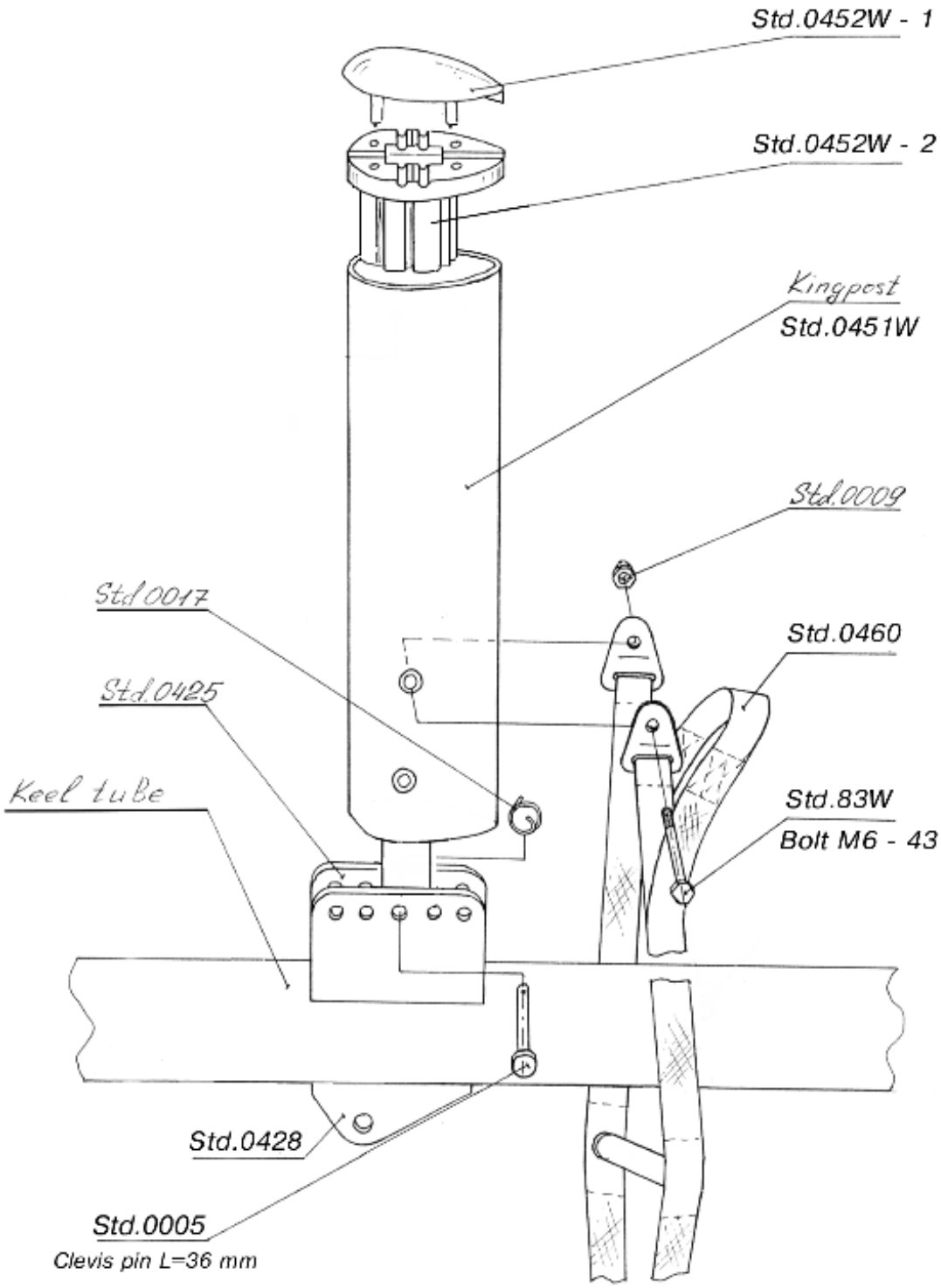


NOSE JUNCTION
OF HANG GLIDER "TARGET 16"

??????

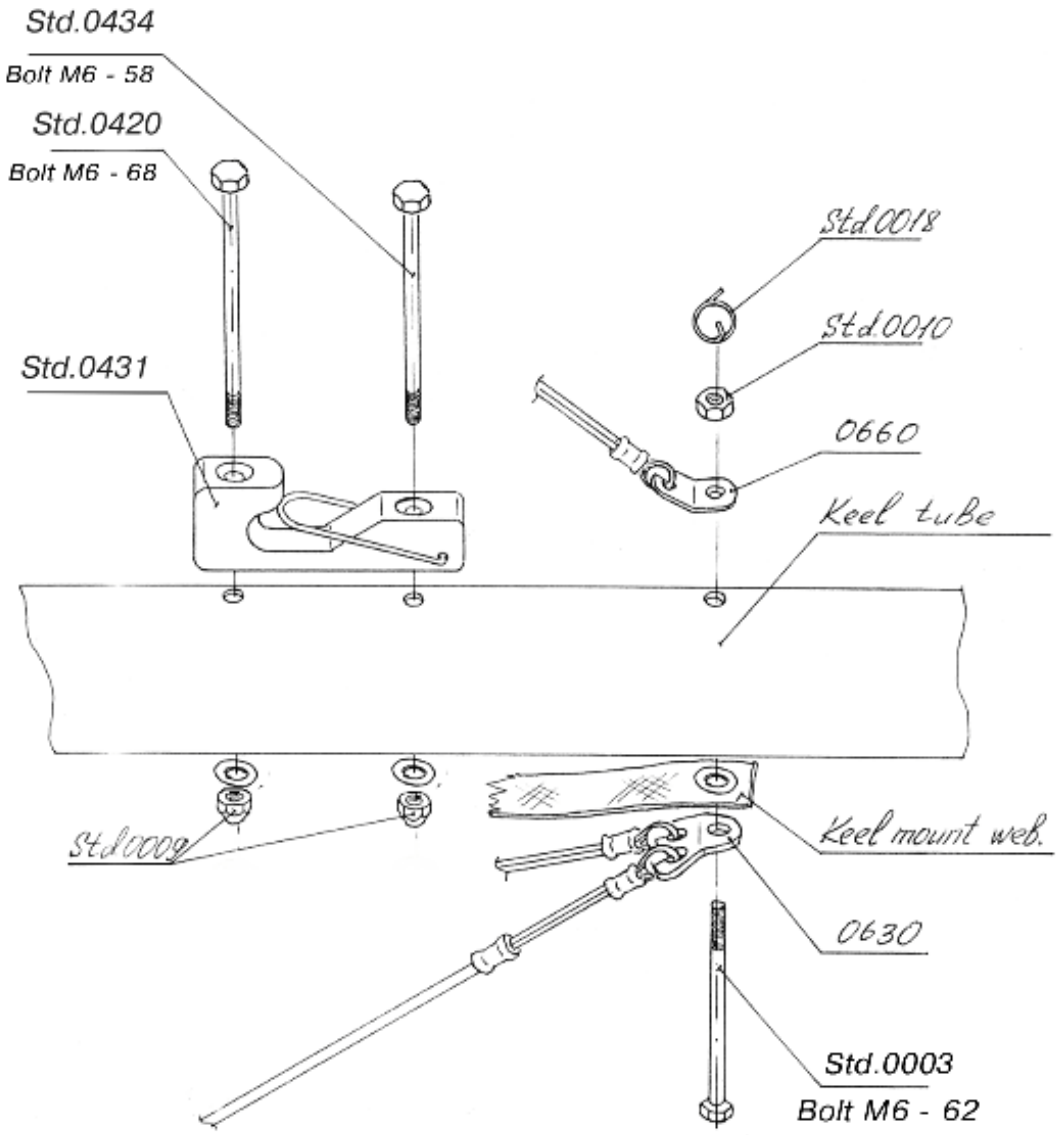


KEEL TUBE / KINGPOST CHANNEL / CONTROL BAR CHANNEL JUNCTION
OF HANG GLIDER "TARGET"



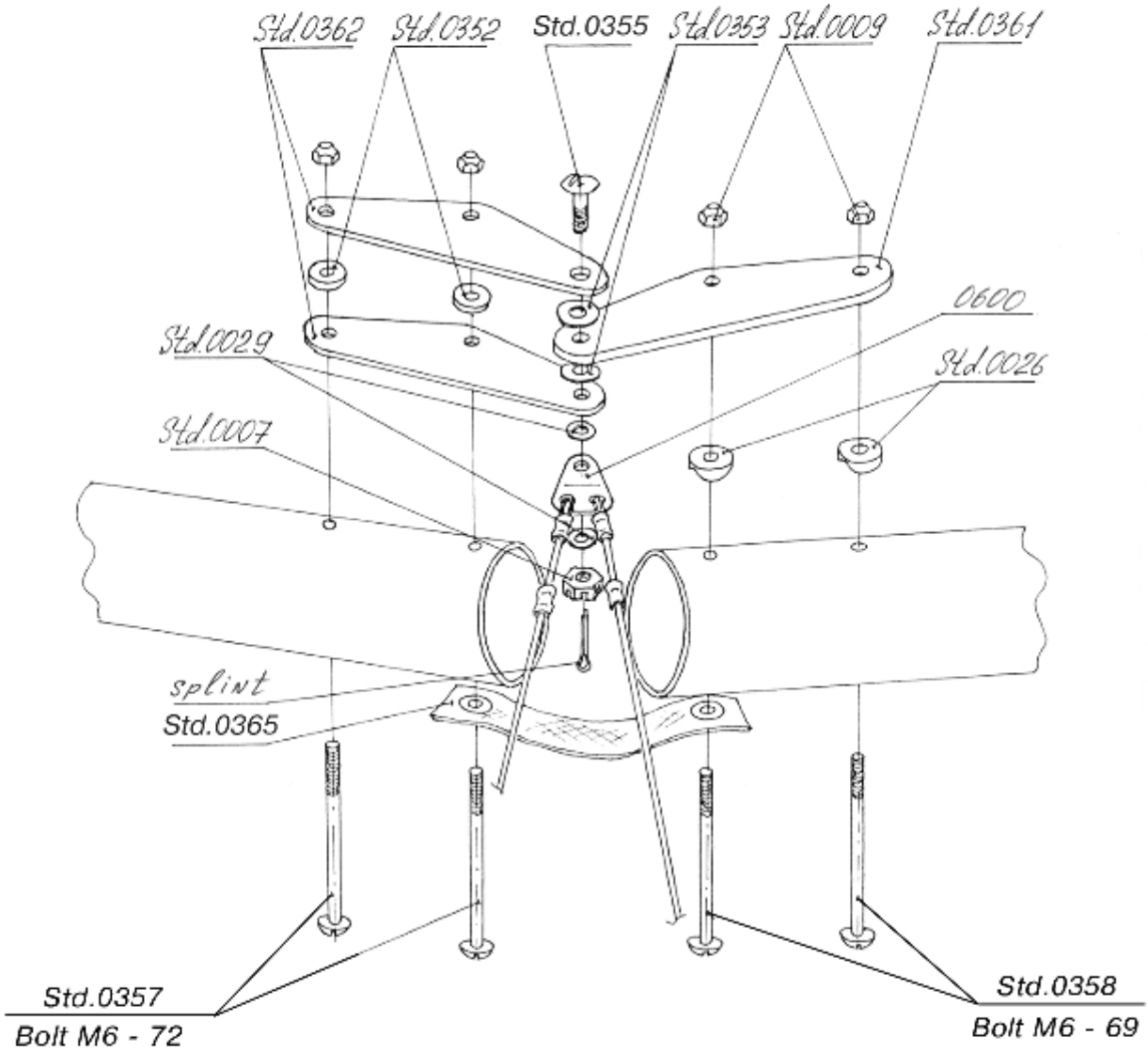
KEEL TUBE / KINGPOST JUNCTION OF HANG GLIDER "TARGET"

??????



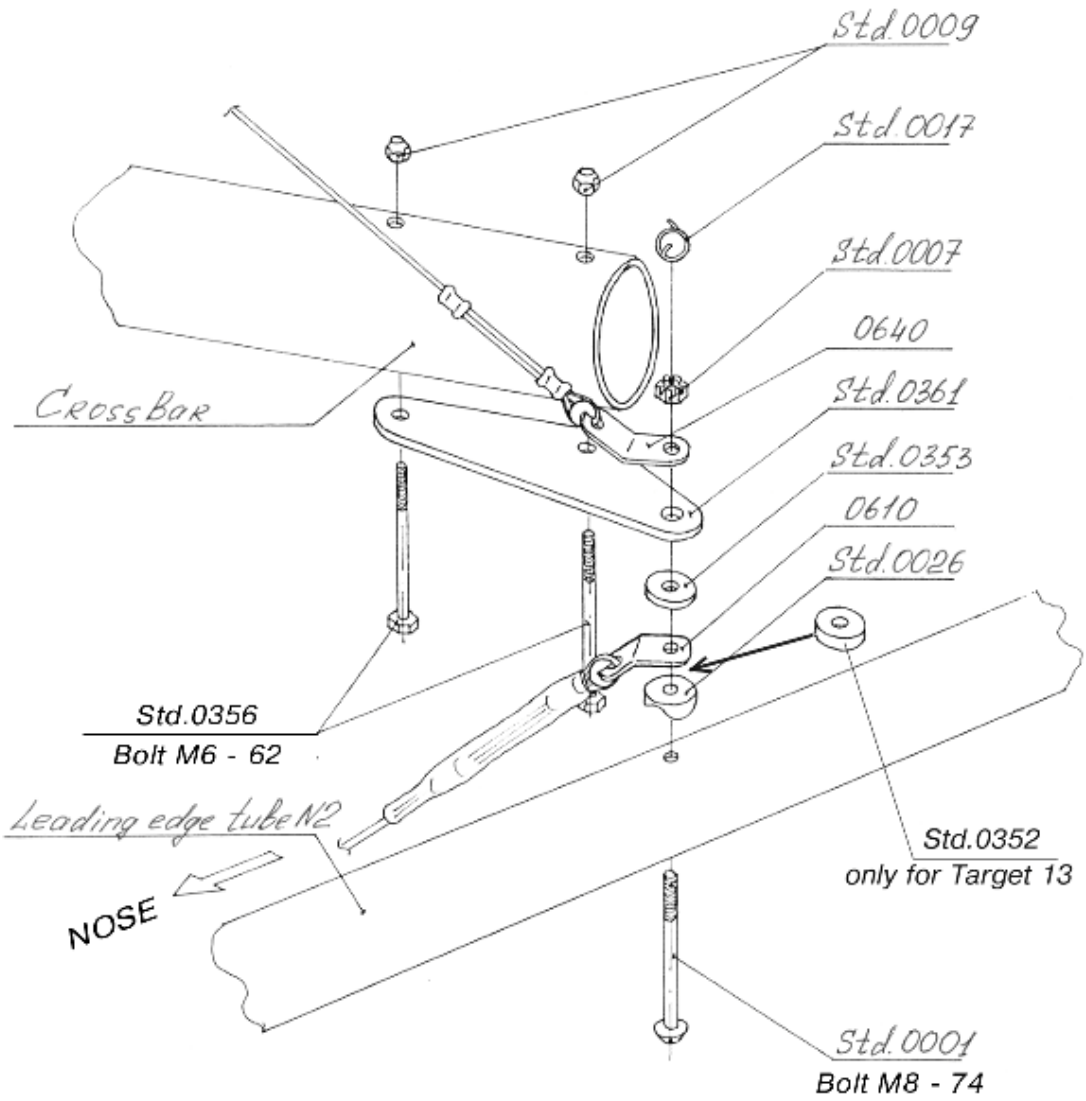
KEEL TUBE REAR JUNCTION OF HANG GLIDER "TARGET"

??????



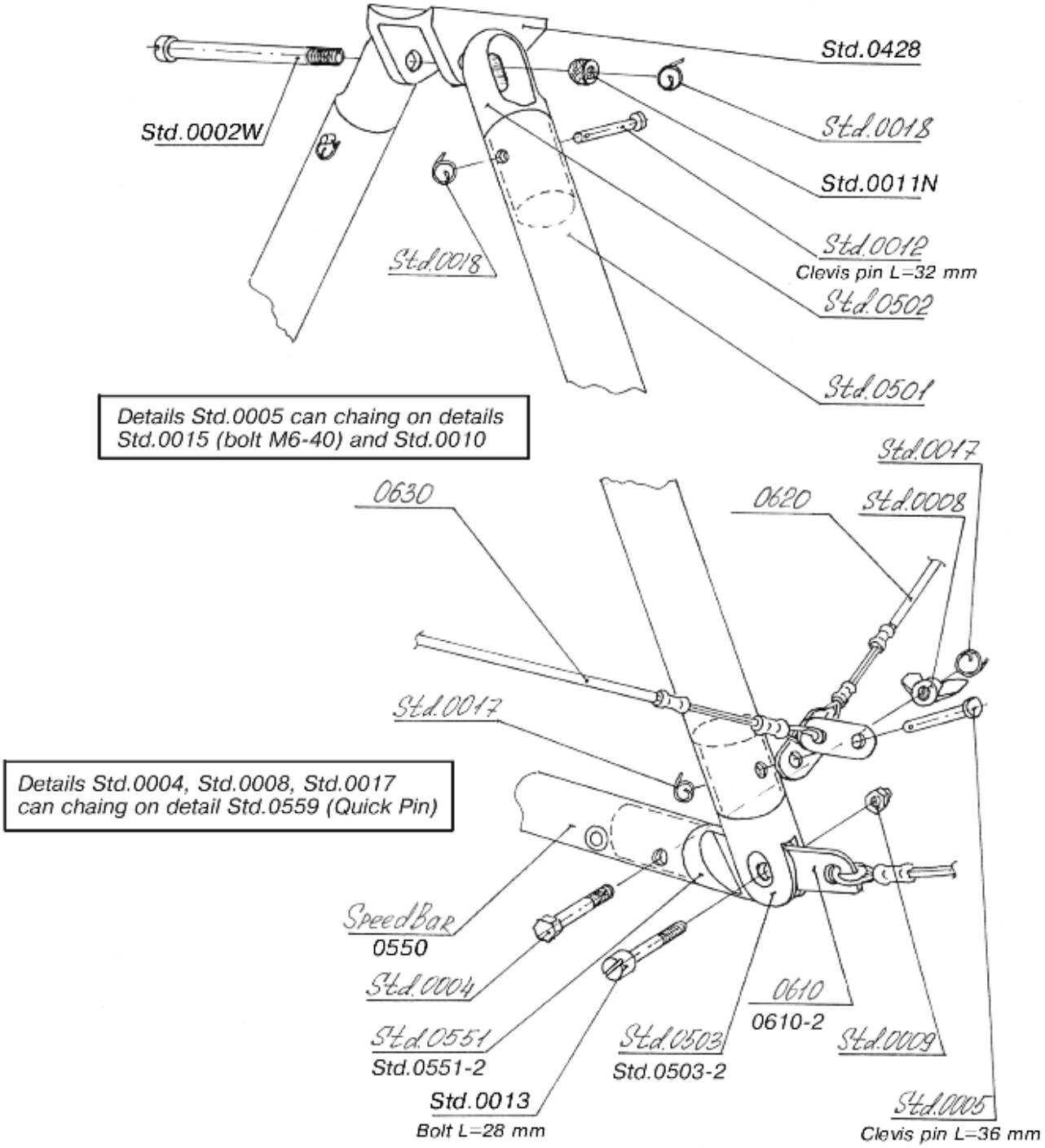
CROSS BAR JUNCTION OF HANG GLIDER "TARGET "

??????



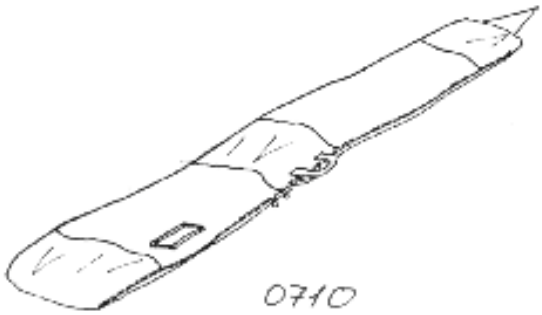
LEADING EDGE / CROSSBAR JUNCTION OF HANG GLIDER "TARGET"

??????

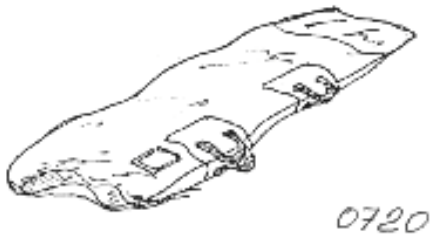


CONTROL BAR OF HANG GLIDER "TARGET"

??????



0710



0720

0730

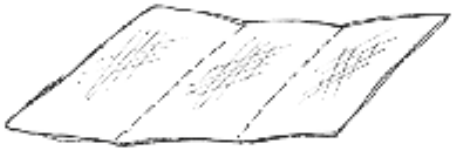
Std. 0760

Std. 0770

Std 0740

Std. 0790

Std 0755



Std. 0760

BAGS OF HANG GLIDER "TARGET"