# HANG GLIDER STEALTH - W

## MANUAL Size: sqm.

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#### Section 1. GENERAL INFORMATION

#### 1.1. Introduction

Stealth hang glider is a product of Aeros Ltd. It is aimed at improvement of modern competitive glider with high performance combined with maximum safety and comfort. Stealth is an exciting addition to its predecessors C-14, C-15 and Stalker through its simplicity of operation, continuity of construction, wide range of flying speeds, excellent handling.

Please read and be sure you thoroughly understand this manual before flying your Stealth. Be sure you are thoroughly familiar with the set up, break down, preflingt and maintenance procedure as described in this manual.

In case of any doubts or questions contact your local dealers or Aeros.

#### 1.2. Main data

The Stealth is a high-performance hang glider designed for foot-lunching, soaring and cross-country flight.

Table 1.2.

	Stealth 14 W	Stealth 13 W	Stealth 12 W
Sail area. sq.m.	14.0	13.2	11.8
Wing span, m	10,25	9,85	9,3
Aspect ratio	7.5	7.35	7.4
Nose angle, °	128-130	128-130	130-132
Pilot weight optim, kg	83	70	55
Weight (without bags), kg	31	29	26
Breakdown length, m	3,9 / 5,8	3.8 / 5.7	3.3 / 5.1
Min sink rate, m/sec	0.95	0.95	0.95
Max glide ratio	111+	11+	11+

#### 1.3. Operation limitations

Table 1.3.

	Stealth 14 W	Stealth 13 W	Stealth 12 W
Operation load	+ 4/-2G	+4/-2G	+ 4/-2G
Wind speed max, m/sec	12	12	12
Take off altitude, m	2 000	2 000	2 000
Permissible range of temperature, °C	-15/+40	-15/+40	-15 / +40
Minimum airspeed, km/h	26	26	30
Maximum airspeed, km/h	100	100	100
Minimum pilot weight, kg	65	55	45 .
Maximum pilot weight, kg	100	85	65

After structural, aerodynamic and flight tests, the Stealth has been shown to comply with BHGA requirements (BHGA certificates No. for Stealth ).

#### ATTENTION! We do not recommend to use Stealth for motorized and aerobatic flights.

Stealth requires pilot proficiency not less than Safe pro 4.

We inform you that manufacturer can in no way be responsible for safety of your flight in case of exceeding operation limitations stated above in present manual.

1.4. Flying tests	1.3		10.5			
Your Hang Glider Stealth	(serial No	) was tested			1	
"Hang glider is airworthy ac	cording to present	manual".		TO KILL		
	0 1	Test pilot	1			

#### Section 2. SET UP PROCEDURE

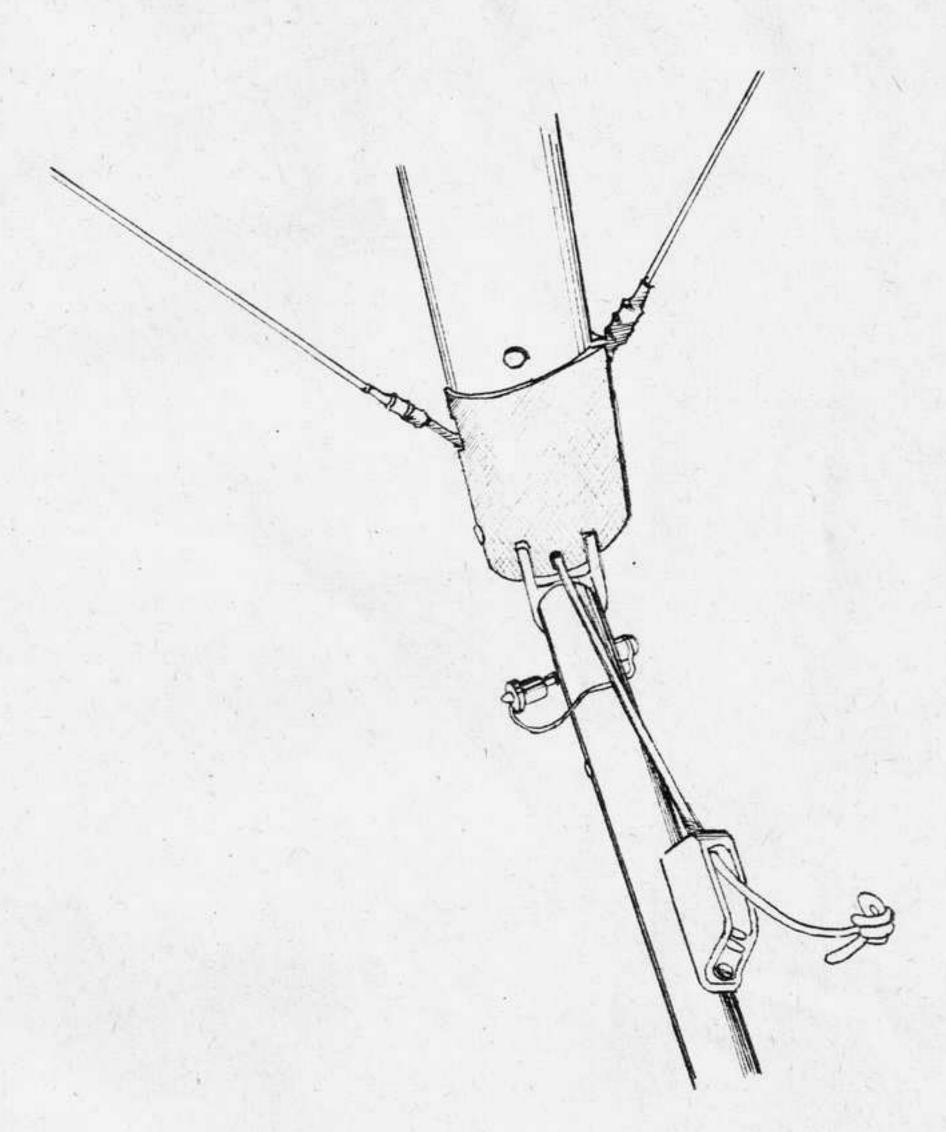
Present manual describes methods, which are distinctive for Stealth. Procedures, typical for all gliders are described shortly.

The set up procedure should be carried out on a clean, not abrasive surface.

ATTENTION: After each set up procedure you must do a preflight inspection of the glider.

#### 2.1. Set up procedure from the package 6 meters long

2.1.1.Remove the speedbar from the bag 6 meters long, spread the downtubes. Install the speedbar so that off-set of the speedbar is directed forward in the direction of the flight. Fix the speedbar using the quickpins. Pass the VG-rope through the stopper, make a knot on the end of the rope (fig.1).



2.1.2. Rest the glider on the control bar, spread the LE-tubes so, that sail is a little sagged and the glider is resting on the consoles and on the keel tube (fig.2).

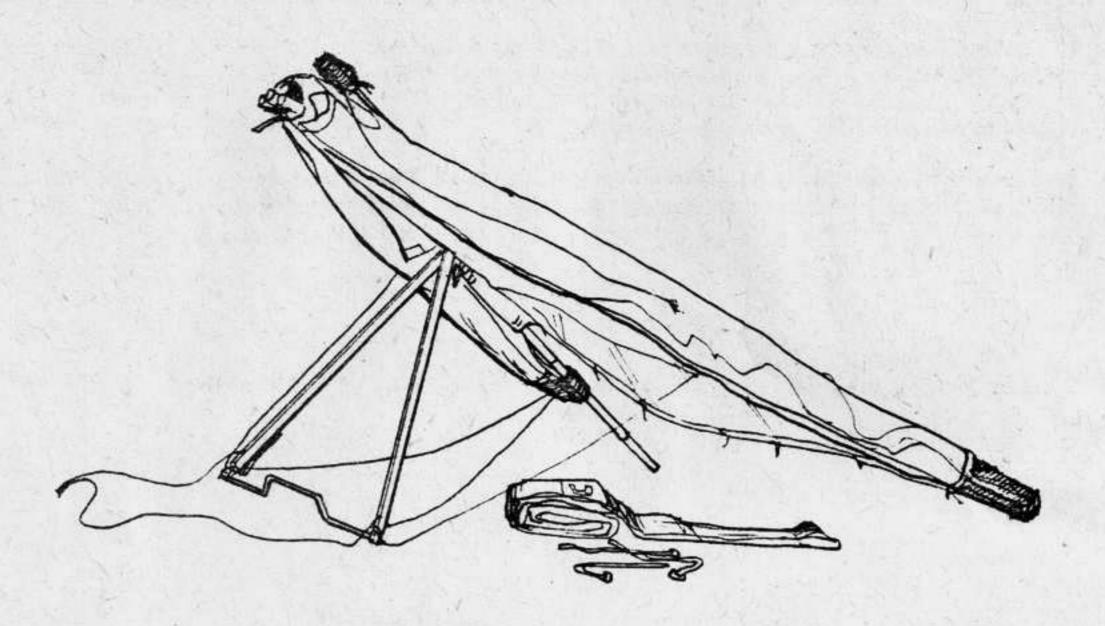


Fig.2

2.1.3. Attach the hook of the top rear wire and the luff lines to the thimble of the top front wire. Make sure that the hook of the wires is not inverted and the luff lines and top wire are not twisted (fig. 3).

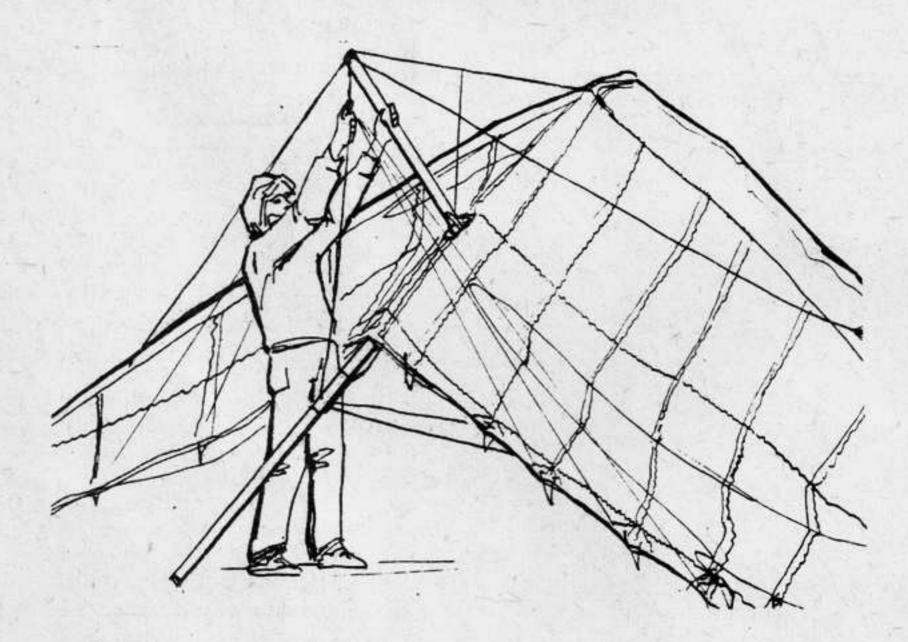
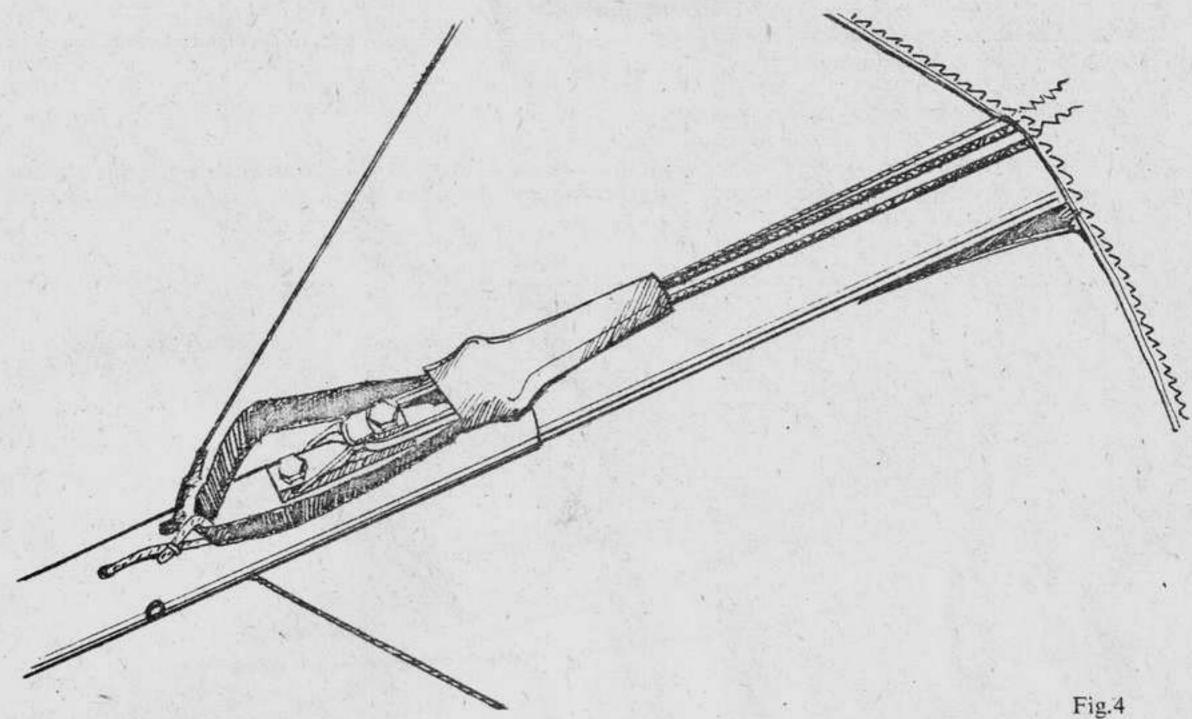


Fig.3

- 2.1.4. Remove the battens from the bags and insert them into corresponding batten pockets (don't remove the bags from the wing tips). Secure each top batten by the leech line loop.
- 2.1.5. Attach the shackle of the crossbar tensioning wires to the hook which is placed on the keel tube (fig. 4). Cleck that crossbar wires and VG ropes are not twisted.



2.1.6. Remove the bags from the wings tips and install the rest of the battens.

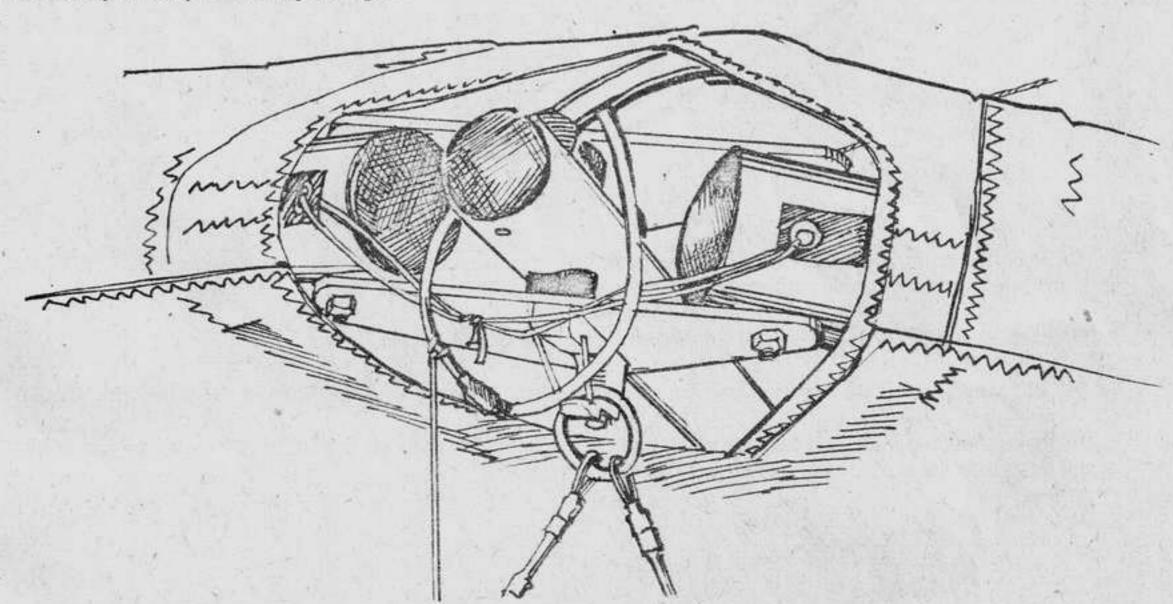
ATTENTION: When attaching the leech line loops to the battens to which the luff lines come, be sure the leech line loops are not caught underneath or wrapped around the luff lines.

- 2.1.7. Secure the ring of the bottom front wires on the hook on the nose junction.
- 2.1.8.Install the bottom surface battens. Insert them until the very end of the batten pockets. Take care that the rope loops are outside.
- 2.1.9.Do a complete preflight inspection of the glider (see Section 2.2 "Preflight inspection of the glider").

#### 2.2. Preflight inspection of the glider

2.2.1.Do a complete preflight inspection of the glider. Check all parts and all assemblies of the glider. Beginning at the nose go around the glider, check all details of the construction. Finish the inspection by checking the keel tube and control frame.

The more you hurry the more you inspect!



- 2.2.2. Check the nose junction. The wires must be secured. The keel batten must be rested on the keel tube (fig.5). Put the nose cone on the sail.
- 2.2.3. Check that the mylars have no bends.
- 2.2.4.Look through the open bottom surface pockets near the Xbar/LE junction and check that this junction is assembled properly and safely secured with the nut and the safety ring (fig.6). Zip the zipper near the Xbar/LE junction.

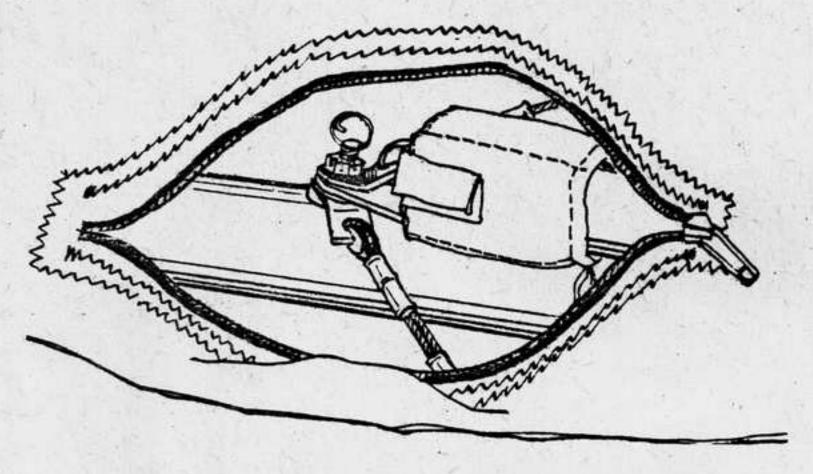


Fig.6

2.2.5.Look into the sail at each wing tip. Tip battens must be rested on the plastic stop. Check for any evidence of dents, deep scratches, cracks or bends in the LE tubes. Be sure that the sail mount webbing is safely and correctly secured in the end cap slot (fig.7). Pay attention to the symmetric tension of the sail.

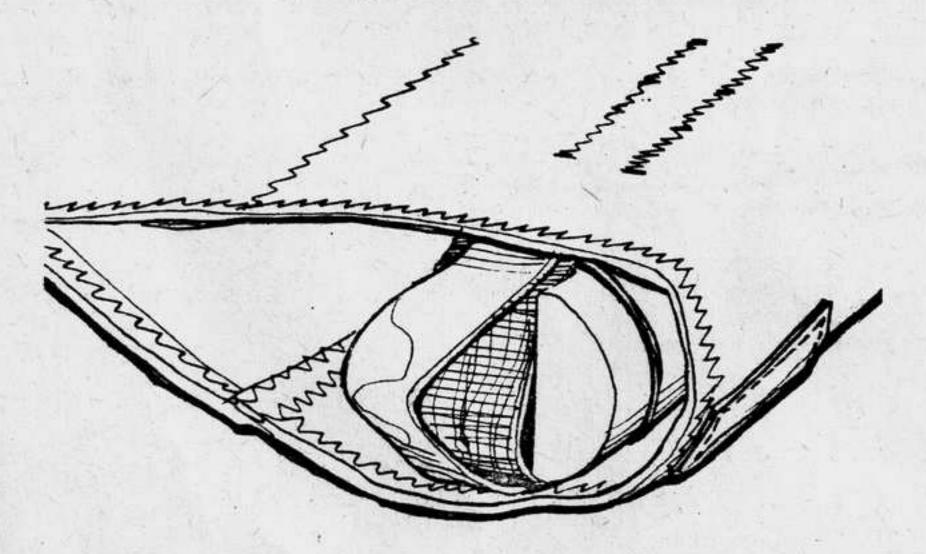


Fig.7

- 2.2.6. Check the trailing edge for any cuts, tears or broken stitching. Check that the battens are fixed. Check that luff lines are fixed in the grommets.
- 2.2.7. Check that no luff line is looped underneath a more inboard batten.
- 2.2.8. Check the rear wires/keel tube junction. Assembly must be fixed with the pin and the safety ring (fig.8).
- 2.2.9. Check that X-bar tensioning wire is secured on the hook on the keel tube. Check the proper disposition of the VG ropes they must not be twisted (fig. 8).

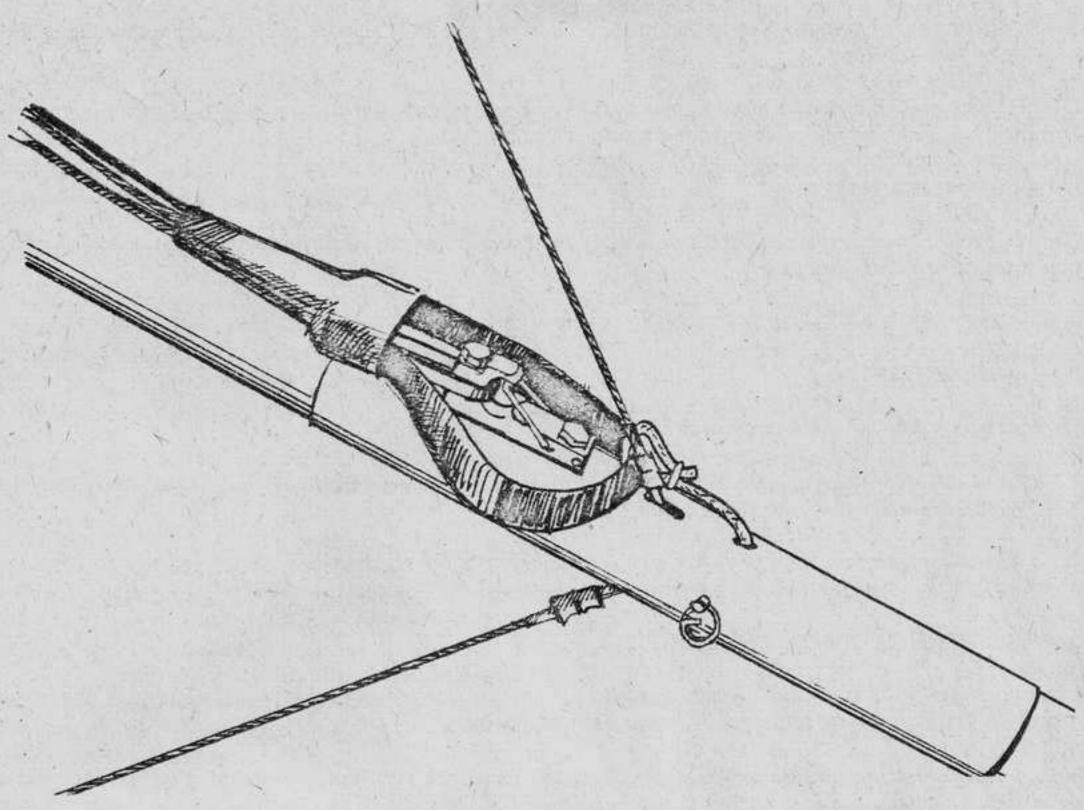
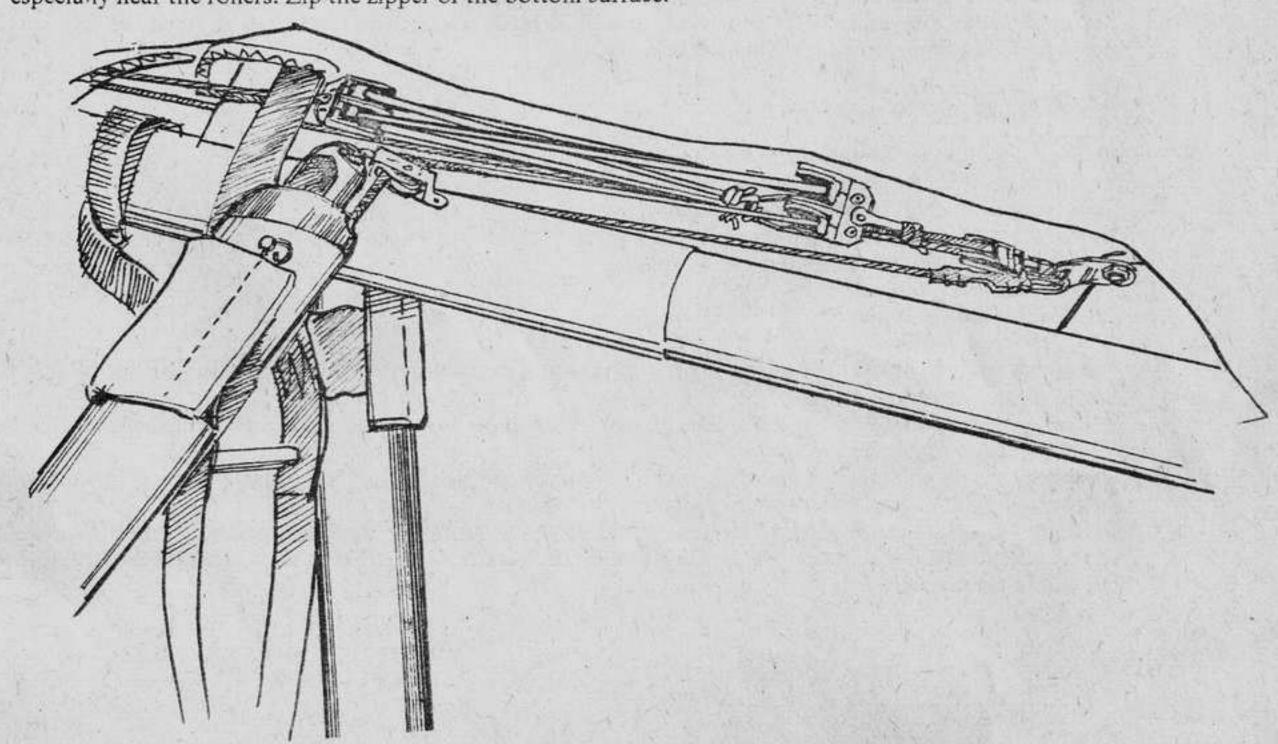


Fig.8

- 2.2.10. Check the presence of the kingpost cap cover.
- 2.2.11. Check through the central zipper of the bottom surface:
  - X-bar wire/Xbar junction;
  - VG blocks/Xbar junction;
  - compensator rope fixing.

The X-bar wire, VG ropes and compensator rope must not be twisted (fig.9). Check the ropes for wear, especially near the rollers. Zip the zipper of the bottom surface.



- 2.2.12. Check the kingpost/keel tube junction. Check the kingpost mounted main and safety hang loops for wear or broken stitching.
- 2.2.13. Check the thimble fittings on the uprights. Be sure that the bottom wires are safely secured. The uprights and speedbar must not have the traces of deformation.

#### Do not fly with bent uprights!

- 2.2.14. Check that off-set of the speedbar is directed forward and upwards in the direction of the flight. Quick pins must be covered with caps.
- 2.2.15. Check that the VG is not too hard to put on and the cross-bar is actuated smoothly.

#### 2.3. Laying the glder flat

Once you have the glider set up, you can lay it flat on the ground.

- 2.3.1.Remove the nose cone from the nose junction. Remove the ring of the bottom front wires from the nose hook. Lay the glider nose into the wind.
- 2.3.2. If the wind is more than 8m/s (18 mph) or there is a big turbulence, detach the hook of the top rear wire with luff lines, move the kingpost forward and attach the hook to the middle of the top front wire.

#### Section 3. PERFORMANCE THE FLIGHT

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 points of Section 2.3. (Laying the glider flat).

Check and adjust your harness. We strongly recommend that you hang as low as possible (as close to the basetube) for maximum ease of roll control. Be sure that no part of the harness touches with the speedbar while pilot moves over all the range of displacements.

#### 3.1. Take off

Make sure you are hooked in and check your position hanging in the control bar.

If the wind is more than 8m/s (18 mph) or is gusty, you should have at least one wire assisstant, on the nose wires.

The Stealth has a slightly tail heavy static balance which does not take effect during take off. When you hold the glider prior to your take off run, you should have the nose slightly elevated and wings level.

The glider takes off easily with zero wind as well as with strong wing and does not require any special methods of handling. Do not pull in after take off.

#### 3.2. Flying

At first handling performances of the Stealth seem to be different from those inherent in other gliders. The reason is that Stealth handles easily at any speed. Don't worry, you'll soon get used to it.

Make your first flights in easy flying conditions.

As the glider begins to turn, you may pull the bar out. Stealth is stable in multiple 360 degree turns at shallow bank angles in both directions and has no sideslip.

#### 3.3. Speed to fly

The range of trim speed of Stealth is 38 - 40 km/h. The speedbar position in front of the pilot's face corresponds to this range.

The range of stall speed of Stealth is 26 - 28 km/h. The glider is stable in a stall, while pushing out the bar, the bar pressure is progressive also.

Stealth speeds up to 80 - 90 km/h easily being essentially roll neutral but sometimes yawing a little. The bar presssure is mild, but progressive and consistent.

With the VG on the range of trim speed of Stealth is 40 - 44 km/h. The speedbar position opposite the pilot's chest corresponds to this range. The bar pressure in pitch is decreasing. The maneu erability is getting worse, but within permitted limits.

#### 3.4. Turning

Stealth handles easily, the control efforts in pich are small. The aggressive turns require to ease the bar out. The speedbar position in front of the pilot's face corresponds to the established multiple 360 degree turns at shallow bank angles.

Stealth realizes the speed very well. That's why avoid radical maneuvering near the slope until you are thoroughly familiar with the glider's response characteristics.

#### 3.5. Variation of the nose angle

Take off should be performed with the VG off.

To put the VG on take the VG rope with your right hand and move it along the speedbar. It needs to be done several times to put the VG on all the way. At the end of every movement check that the rope is fixed in the clamcleat on the speedbar.

To put the VG off take the VG rope away from the clamcleat and the X-bar will be back to its initial position by itself.

Landing can be performed with both VG on and VG off. Take into account that the glider with the VG on has the higher landing speed than the one with the VG off, but it goes into a stall earlier.

#### 3.6.Landing

As the Stealth is a high performance wing, you should land only into the wind and avoid going downhill. Stealth requires thorough handling during landing.

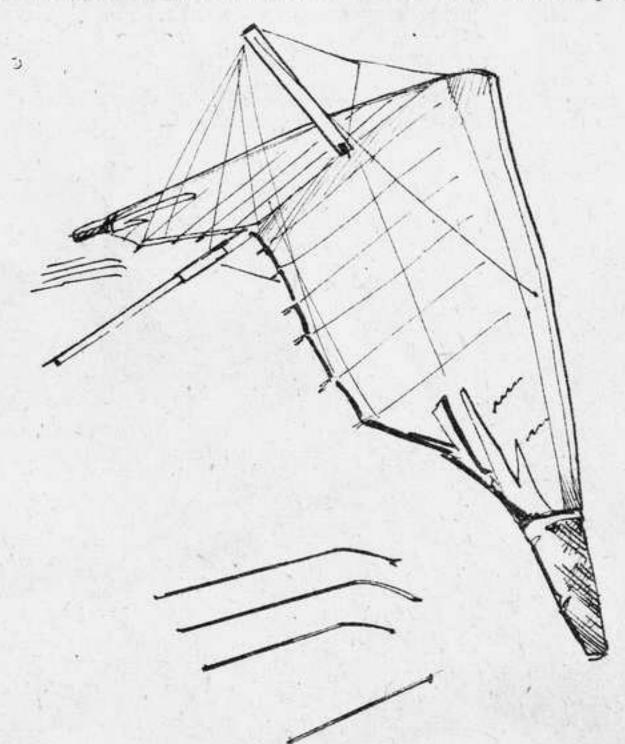
Keep the wings level, speed the glider up slightly and fly right down till the altitude is 0,5 - 0,8 m from the ground to the speedbar. At this altitude decrease descent rate by pushing slightly the control bar. When you feel the glider unresponsive to the bar displacement quickly ease the bar out all the way before your feet touch the ground. With a good sharp final thrust, the sudden increase in drag will slow the glider very suddenly and you will land softly.

Do not ease the bar out at surplus speed! It leads to sudden flare up and following fall.

#### We wish you soft landing!

#### Section 4. BREAKDOWN

- 4.1.Breakdown into the package 6 metres long
- 4.1.1.Put the VG off.
- 4.1.2. Remove the battens from the outboard section of the sail and put the outboard wing cones on (fig. 10).



- 4.1.3. Put the nose cone off and detach the ring of bottom front wires from the hook.
- 4.1.4. Unzip the bottom surface and orientate the paddings sewed on the sail so that they protect the thimble fittings of the uprights from the contact with sail (fig. 11). Zip the zipper.

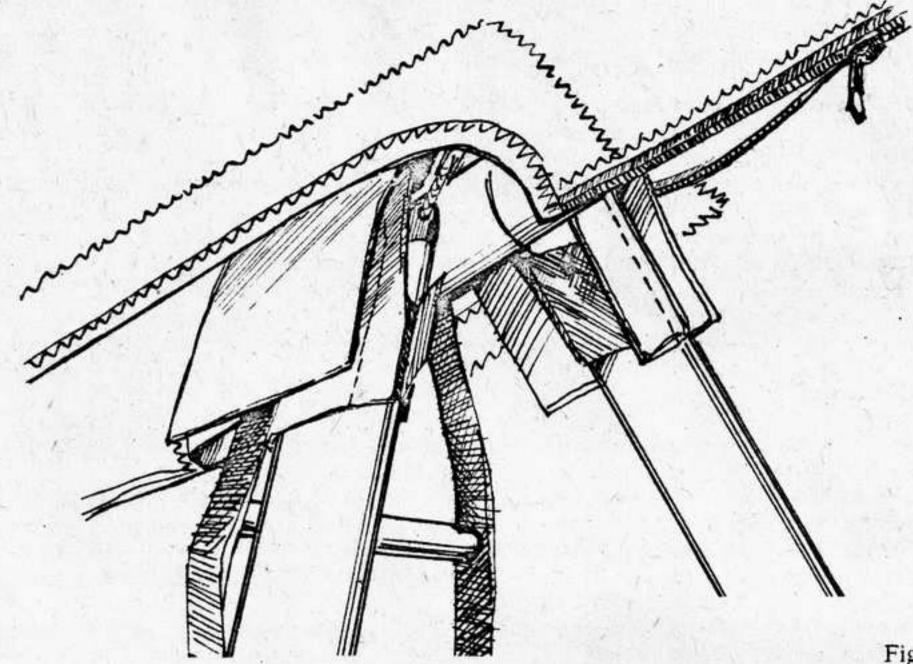
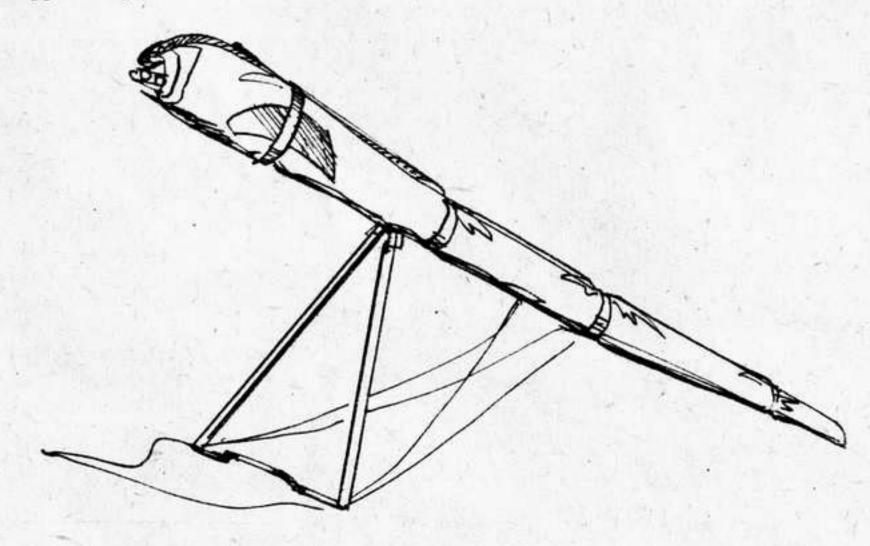


Fig. 11

4.1.5. Pull in the wings slightly and remove all battens except the top battens No.1. Remove only the fixing wires from these battens. Put the battens into the bags.

#### Do not forget the bottom battens in the sail!

- 4.1.6. Detach the hook of the top rear wire with luff lines from the kingpost and attach it to the middle of the top front wire. Move the kingpost down.
- 4.1.7. Pull in the wings along the keel tube. Spread the sail so that both the top and bottom surfaces of the sail are equally taut, roll the sail putting the luff lines inside, and place it along the leading edge. Fix the sail with the tighten tapes.
- 4.1.8. Cover the rear keel tube/wires junction by a cone. Place the bags with battens in the nose section along the kingpost, put the nose cone under the nearest to the nose tighten tape (fig. 12). Fit the bag over the glider (from the upper side).



- 4.1.9.Lay the glider iin the bag on the ground. Detach the speedbar from the uprights and place it between the leading edges.
- 4.1.10. Cover the downtubes junctions in the low control bar corners by a cone and place them along the keel tube. Straighten the bottom wires and the spacer between the downtubes. Zip the zipper on the bag. The glider is ready for transportation.

#### 4.2. Breakdown into the package 4 metres long

- 4.2.1. Perform the procedures as described in the points 4.1.1. 4.1.10., except the last procedure.
- 4.2.2.Remove the sail mount webbing from the leading edges end caps. Press the spring lock pins through the sail and remove the tubes No.3 from the sail.
- 4.2.3. Place the leading edge of one sail over the other one, fold the sail to the nose and fix it with the tighten tape to the bag.
- 4.2.4. Place the detached leading edges into the bag and zip the bag.

#### Section 5. MAINTENANCE

#### 5.1. Tuning

Properly tuned, the glider is comfortable, well controllable and safe in all permissible flight modes.

Stealth has several adjusting points can be used for essential changes of performances.

Do not use few adjusting points simultaneously!

#### 5.1.1. Hang point

The range of trim speed of Stealth is 38 - 40 km/h. The speedbar position in front of the pilot's face corresponds to this range.

If the control bar wants to go forward - the trim speed is too small. Move the kingpost to the next forward hole in the kingpost channel.

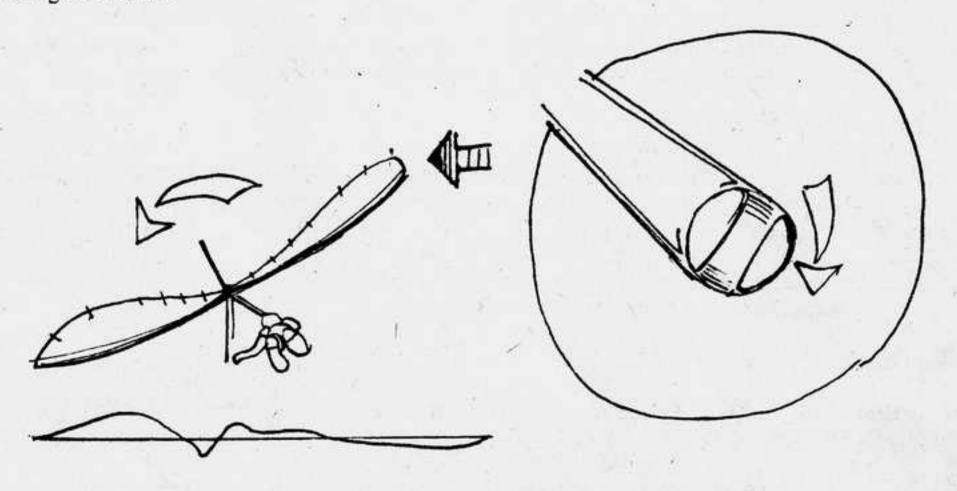
If the control bar goes backward, the sink rate increases and the handling becomes more heavy - the trim speed is too big. Move the kingpost to the next backward hole in the kingpost channel.

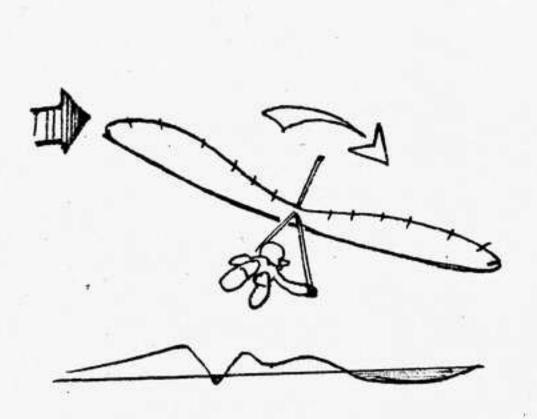
Do not miss the holes in the kingpost channel during hang point position adjustment!

Pilot's weight has an effect on trim speed. If the trim speed is got for the pilot of 80 Kg, the pilot of 60 Kg has to move the kingpost to the next backward hole to keep this trim speed.

#### 5.1.2. Console cap alignment

If the glder flyes assymetrically, change angles of the console caps. To do this remove self-tapping screws and turn the console caps in opposite directions. For a left roll, turn the right plug to increase wing geometric twist. For a right roll, turn the left plug to increase wing geometric twist (fig.13). Fix the cap in the chosen position using the screws.





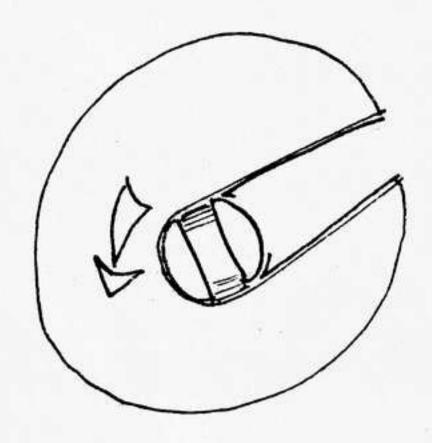


Fig.13A

#### 5.1.3. Crossbar tension

When increasing the crossbar tension, a tendency to yaw at higher speed appears. Generally this adjusting is made after a long time operation, when the sail is too loose and the handling feels mushy.

We do not recommend you to do this procedure with the new sail adjusted by the manufacturer.

If you have no experience in adjusting, we recommend you to contact our experienced pilots or other similar pilots!

#### 5.2. Periodical maintenance inspection

Your glider should have a periodical maintenance inspection:

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

#### 5.2.1. Inspection of the frame

Inspect all tubing 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. Especially take care about the bottom side wire which is the most loaded in the glider construction!

#### 5.2.2. Inspect the main and safety hang loops for wear and replace it is any wear is indicated

#### 5.2.3. Inspect the sail

Inspect the sail carefully for tears and broken stitching, especially along the trailing edge. the sail mount webbing attachment point at the wing tips and the keel section stitches. Have any discovered defects repared. Apply the manufacturer if the sail is not intact, and your will get professional repairs.

#### 5.2.4. Inspection of the battens

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. If you have no template at the moment, check the symetry of the left-wing and right-wing battens.

Have any discovered defects repared. If any broken part cannot be repared, it should be replaced using the spairs. Apply the manufacturer, if there are no necessary spairs.

#### 5.3. Maintenance

You should continually maintain your glider in a proper state of tune to insure optimum performance and flight characteristics for a long time.

We recommend that you do not expose your glider to any more solar radiation than necessary.

Do not leave your glider staying on the control bar for a long time when the wind is strong. It will decrease the life of your sail. Keep the glider under your care.

Do not fold the wet sail. In case of necessity you should unfold the sail and dry it thoroughly after the first possibility.

Your sail should never be washed in anything other that fresh water without any soap or detergent.

If you set up or break down your glider take care not to allow sand, soil and dirt to enter your sail, butten pockets or tubes.

Keep the telescopic connectors thoroughly clean as their dirtying will make the set up or break down diffiucult or impossible.

#### GOOD FLY!

#### TABLE OF CHANGE AND ADDITION

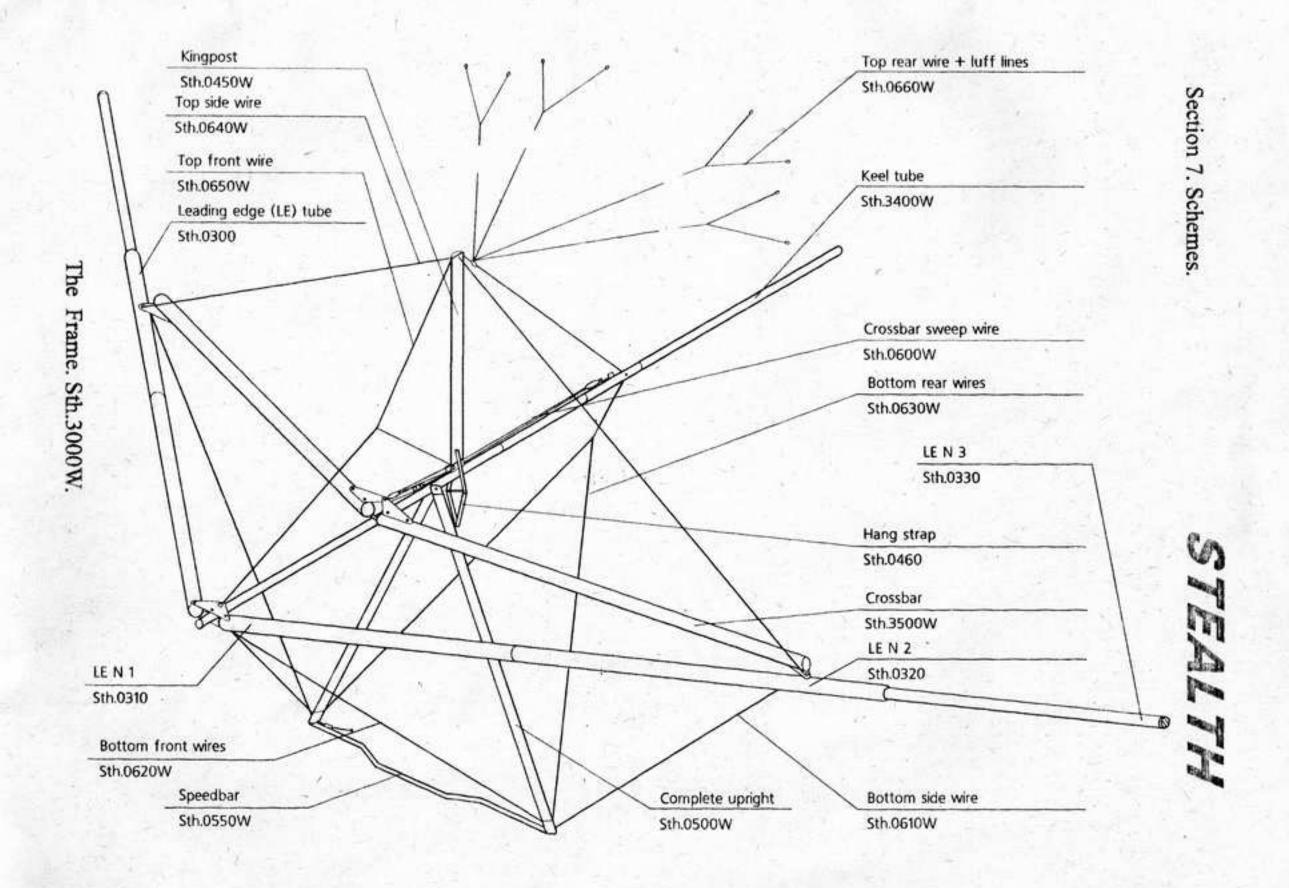
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AT 17		

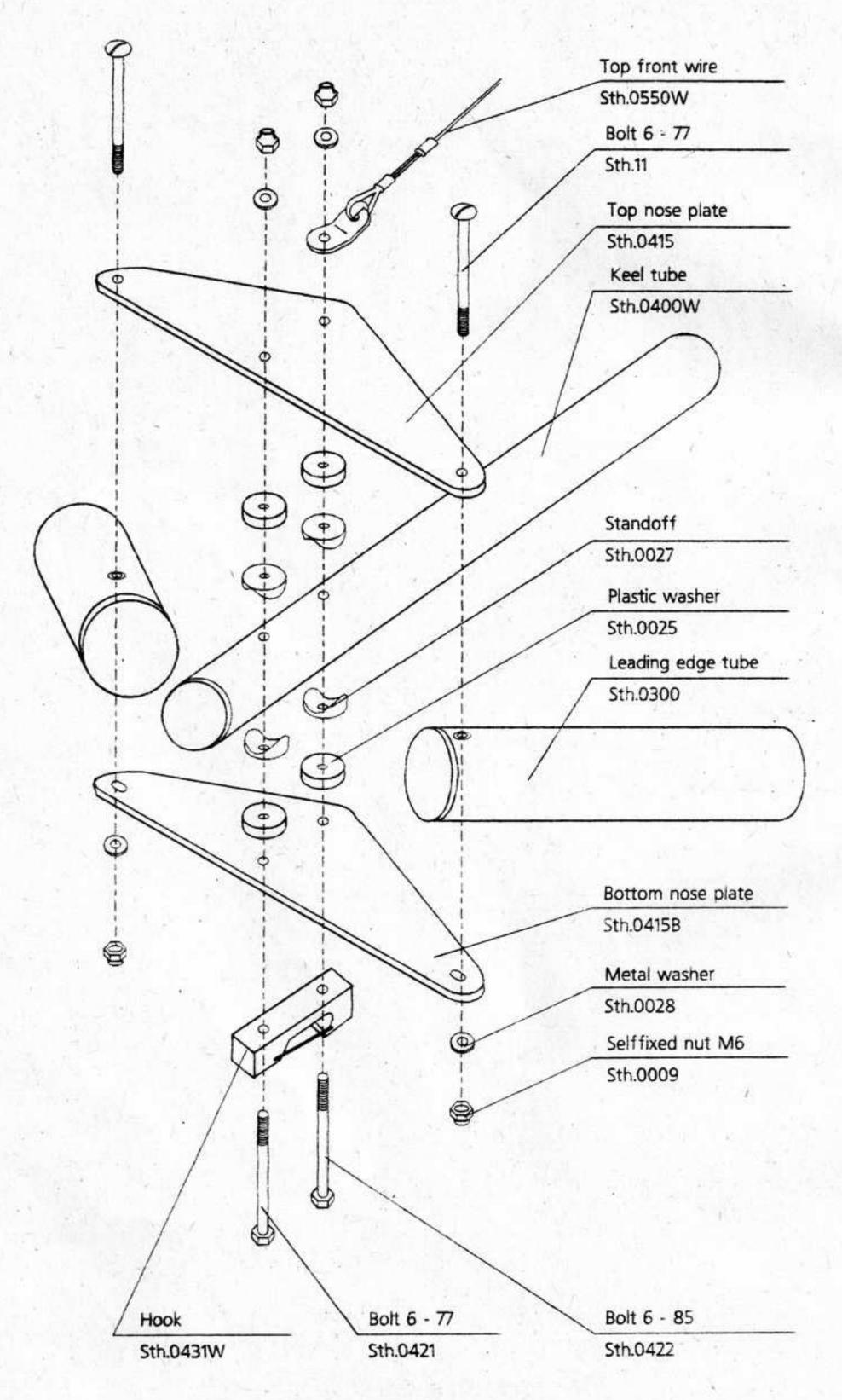
#### Section 6. LIST OF SPARE PARTS

Number	Name
Sth.1000	Complete sail
Sth.0100	Sail
Sth.0101	Nose cone
Sth.0110	Mylar (L+R)
Sth.2000	All battens
Sth.2100	Right battens or left battens
Sth.0201	Batten №1
Sth.0202	Batten №2
Sth.0203	Batten №3
Sth.0204	Batten №4
Sth.0205	Batten N25
Sth.0206	Batten №6
Sth.0207	Batten №7
	Batten №8
Sth.0208	
Sth.0209	Batten №9
Sth.0210	Batten №10
Sth.0211	Tip batten
Sth.0220	Keel batten
Sth.0231	Shovel of battens
Sth.0232	Shovel of keel battens
Sth.0233	Fork of top battens
Sth.0234	Fork of battens d=12 mm
Sth.0251	Bottom batten №1
Sth.0252	Bottom batten №2
Sth.3000W	Frame
	(without battens)
Sth.0300	Leading edge tube
Sth.0310	Leading edge tube №1
Sth.0320	Leading edge tube №2
Sth.0330	Leading edge tube №3
Sth.0342	Tip batten stop detail
Sth.0343	Console cap .
Sth 2500M	Complete ereceber
Sth.3500W	Complete crossbar
Sth.3501W	Crossbar with XB wire
Sth.0351	Tube 58x1,5 L=3020 mm
Sth.0352	Plastic washer 6-mm thick
Sth.0353	Fluoroplastic washer
Sth.0361	Plate 5-mm thick
Sth.0362	Plate 3-mm thick
Sth.0365	X-bar junction tape
Sth.0370	Limit tape
Stl3400W	Complete keel tube

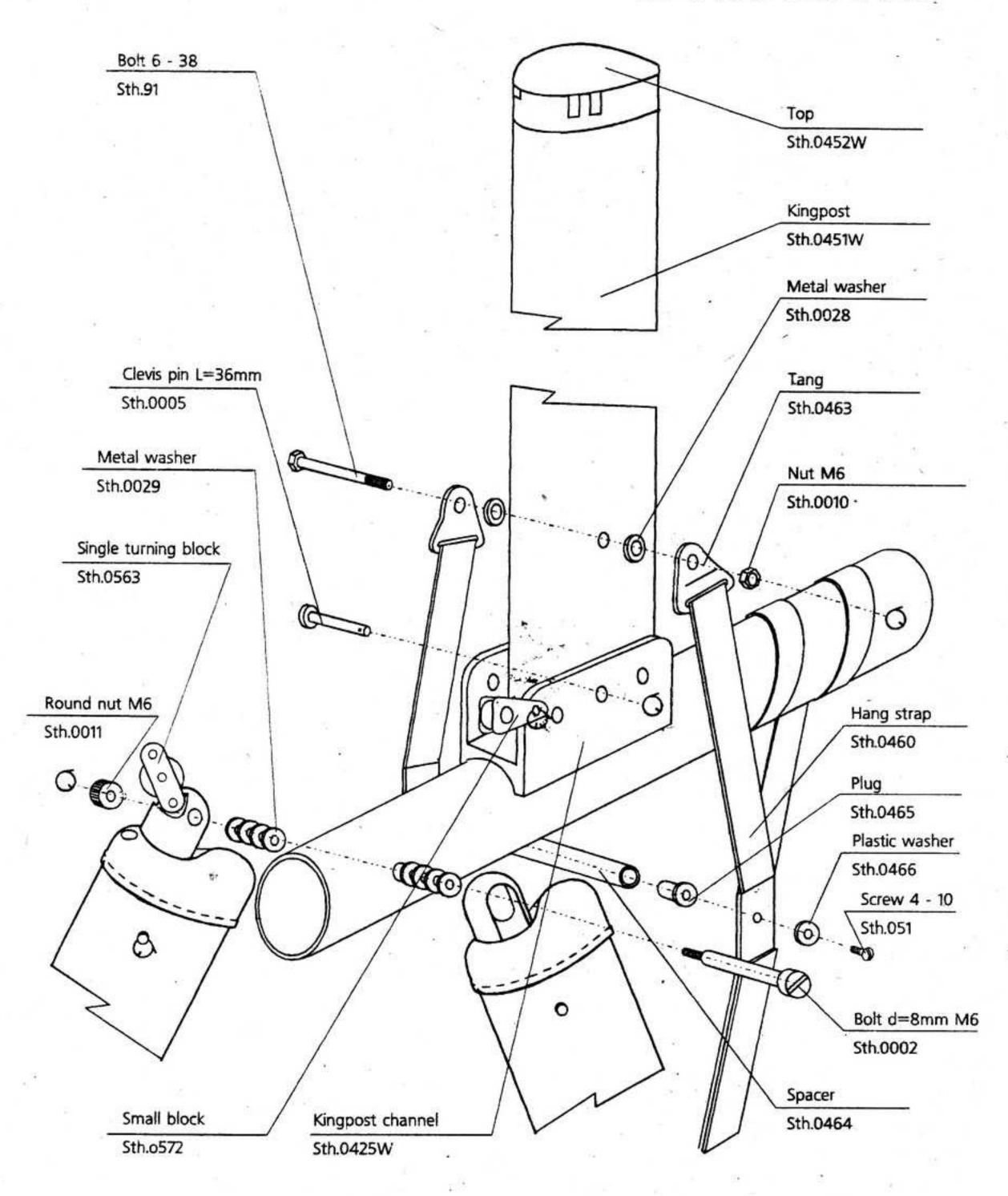
Keel tube without details
Keel tube № 1
Keel tube № 2
Tube 42x1 L=1300 mm
Top nose plate
Bottom nose plate
Plug for 42x1
Kingpost channel
Shock cord L=1500 mm
Keel tube's hook
Kingpost
Hang strap
Tang for bands
Trung for burids
Complete uprights
Uprights aerofoil tube L=1620 mm
Upper detail - right
Upper detail - light
Upright bottom inner tube - right
Upright bottom inner tube - left
Control-bar corner
Faired top cap
Faired bottom cap
Clevis pin 6-30
Bolt 6-48 .
Counter nut M6
Screw
Roller
Complete speedbar
Undrilled speedbar
Clamcleat
Rubber grip L=280 mm
Trabber grip E-200 mmi
VG rope sistem
VG rope
X-bar rope
Single turning block
Double block
Single block
Compensate sistem
Keviar rope
Small block
Protective cover
1 # V L
on/off X-bar strap
Staple
Staple Bolt 6-32
Staple

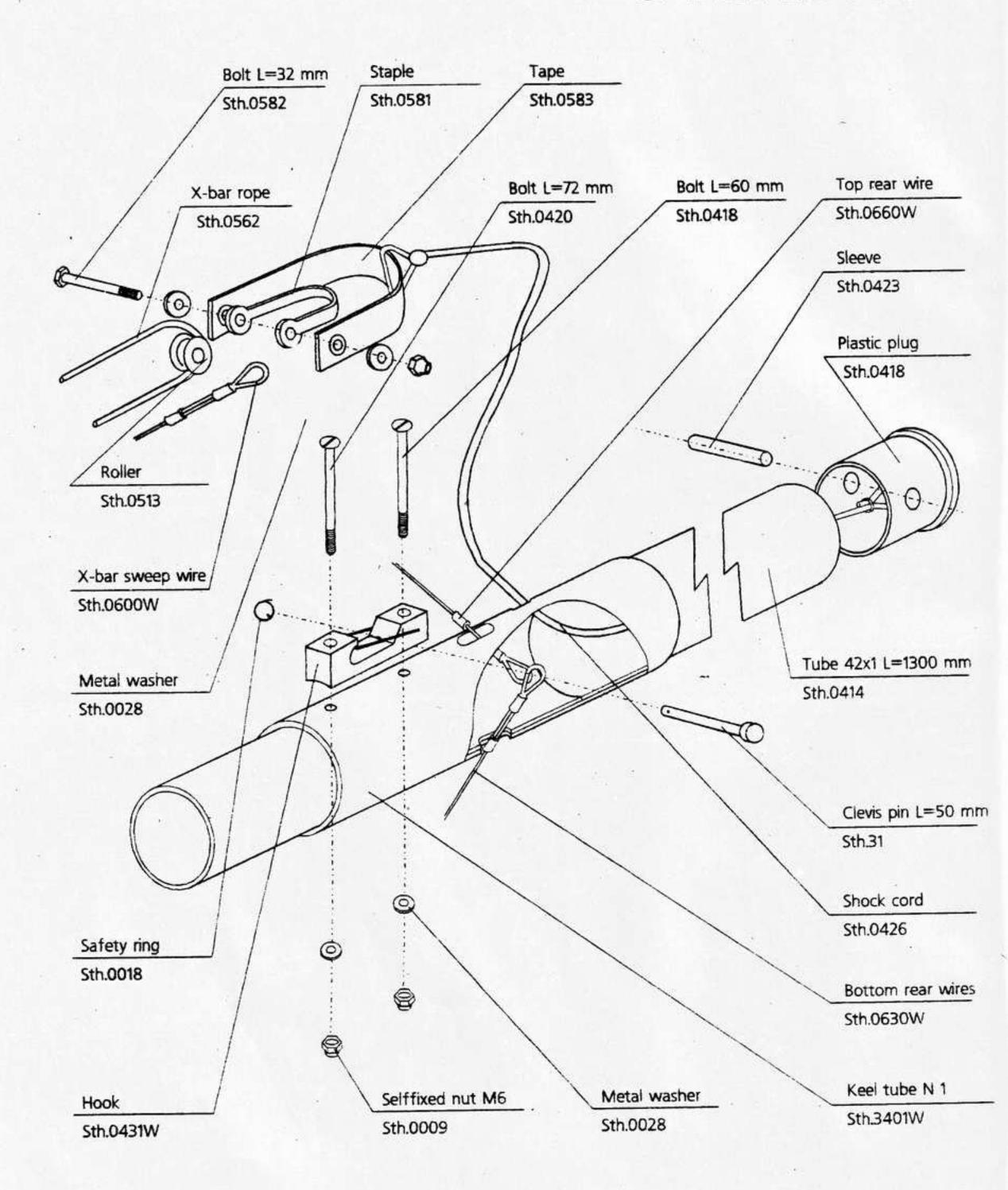
Sth.0600W	Crossbar sweep wire	
Sth.0610W	Bottom side wire	
Sth.0620W	Bottom front wires	-
Sth.0630W	Bottom rear wires	,
Sth.0640W	Top side wire	
Sth.0650W	Top front wire	
Sth.0660W	Top rear wire + luff lines	
Sth.0001	Bolt 8-84 (LE + X-bar)	
Sth.0002W	Bolt d=8mm M6 (keel + control bar)	
Sth.0005	Clevis pin L=36 mm	10
Sth.0007	Custle nut M8	
Sth.0009	Selffixed nut M6	
Sth.0010	Nut M6	
Sth.0011	Round nut M6	
Sth.0016	Nut cap	
Sth.0017	Safety ring	
Sth.0018	Small safety ring	
Sth.0025	Plastic washer 3-mm thick	
Sth.0026	Standoff (2)	
Sth.0027	Standoff	
Sth.0028	Metal washer 10-6-1	
Sth.0029	Metal washer 16-8-1	
Sth.0030	Metal washer 11-4-2	
Sth.0031	Rubber wheel	
Sth.0040	Button spring (2)	-
Sth.0050	Self-tapping flush screw 4-10	
Sth.0051	Self-tapping screw 4-10	
Sth.0052	Self-tapping screw 5-10	
Sth.0060	Rivet 4-6 Al	
Sth.0061	Rivet 4-10 Al	
Sth.0062	Rivet 3-6 Al	
Sth.11	Bolt 6-77 (LE + keel)	
Sth.31	Clevis pin L=50 mm (rear wires + keel t.)	
Sth.71	Clevis pin L=55 mm (LE2 + LE3)	94
Sth.81	Bolt Quick Pin	
Sth.91	Bolt 6-38 (hang strap + kingpost)	
		111222
Sth.7000W	All bags and packing set	
Sth.0710	6-metres bag	
Sth.0730	Battens bag	
Sth.0740	Protective bag for bottom of uprights	
Sth.0745	Uprights top bag	1
Sth.0755	Wing tips bag	
Sth.0755	Protective cover for X-bar strap	
Sth.0760	Tighten tape	
Sth.0770	Protective bag for end X-bar tube	I Later
Sth.0775	Kingpost top bag	
Sth.0790	Rear keel junction bag	
C4h ABAA	Dettana tamplata	
Sth.0800	Battens template	
Sth.0810	Manual	
Sth.0850	Aerofoil wingtips (L + R)	

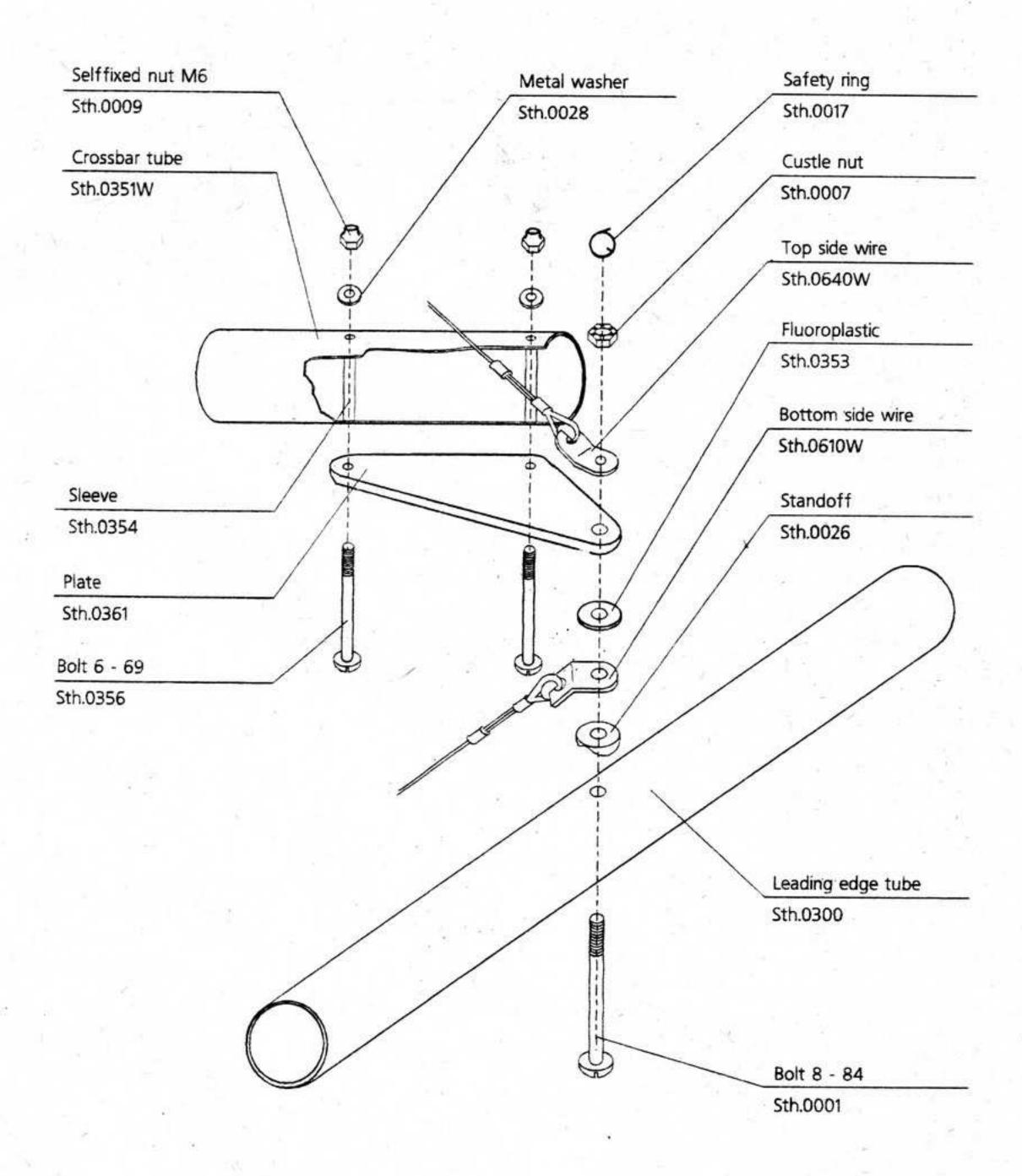


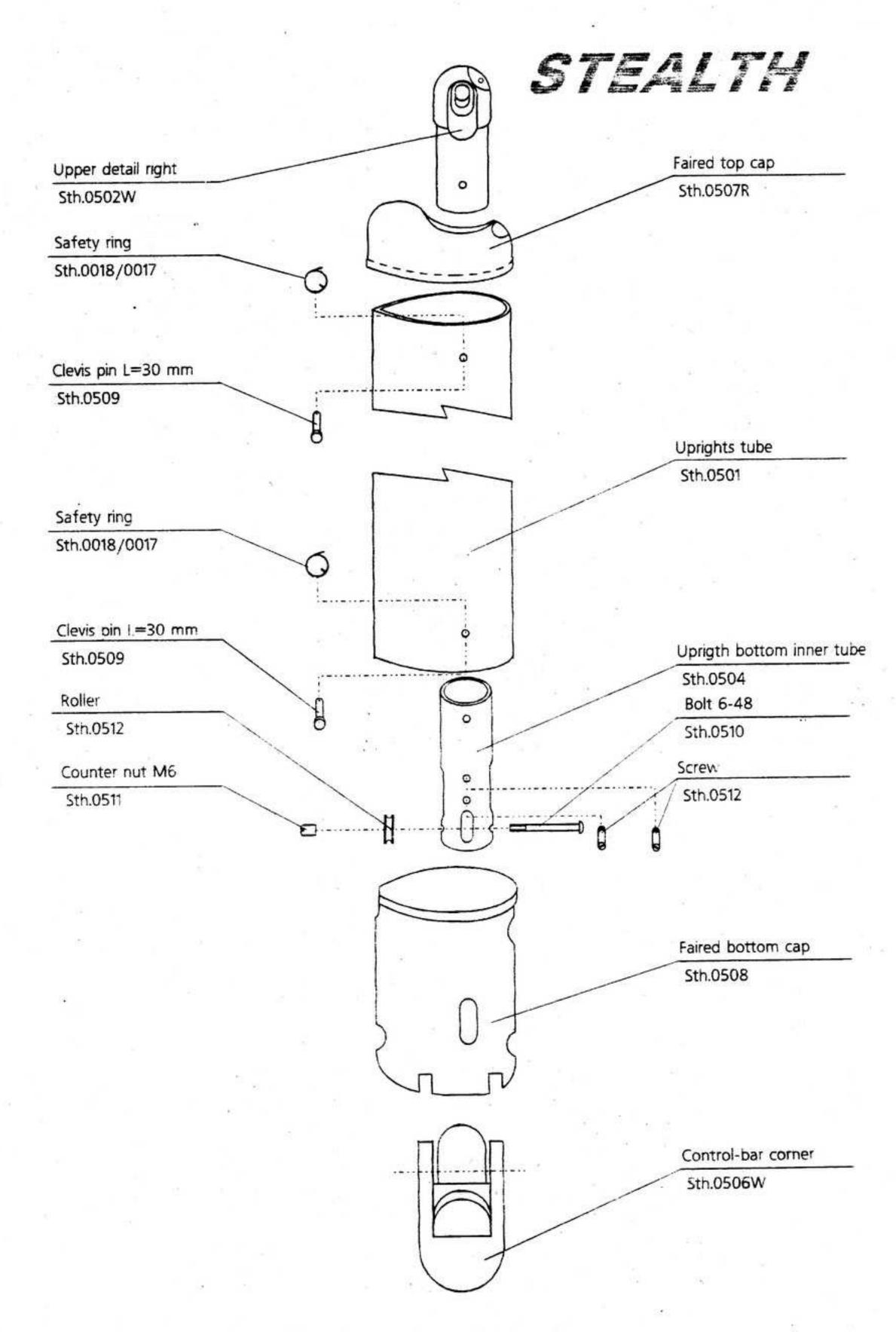


Nose Junction

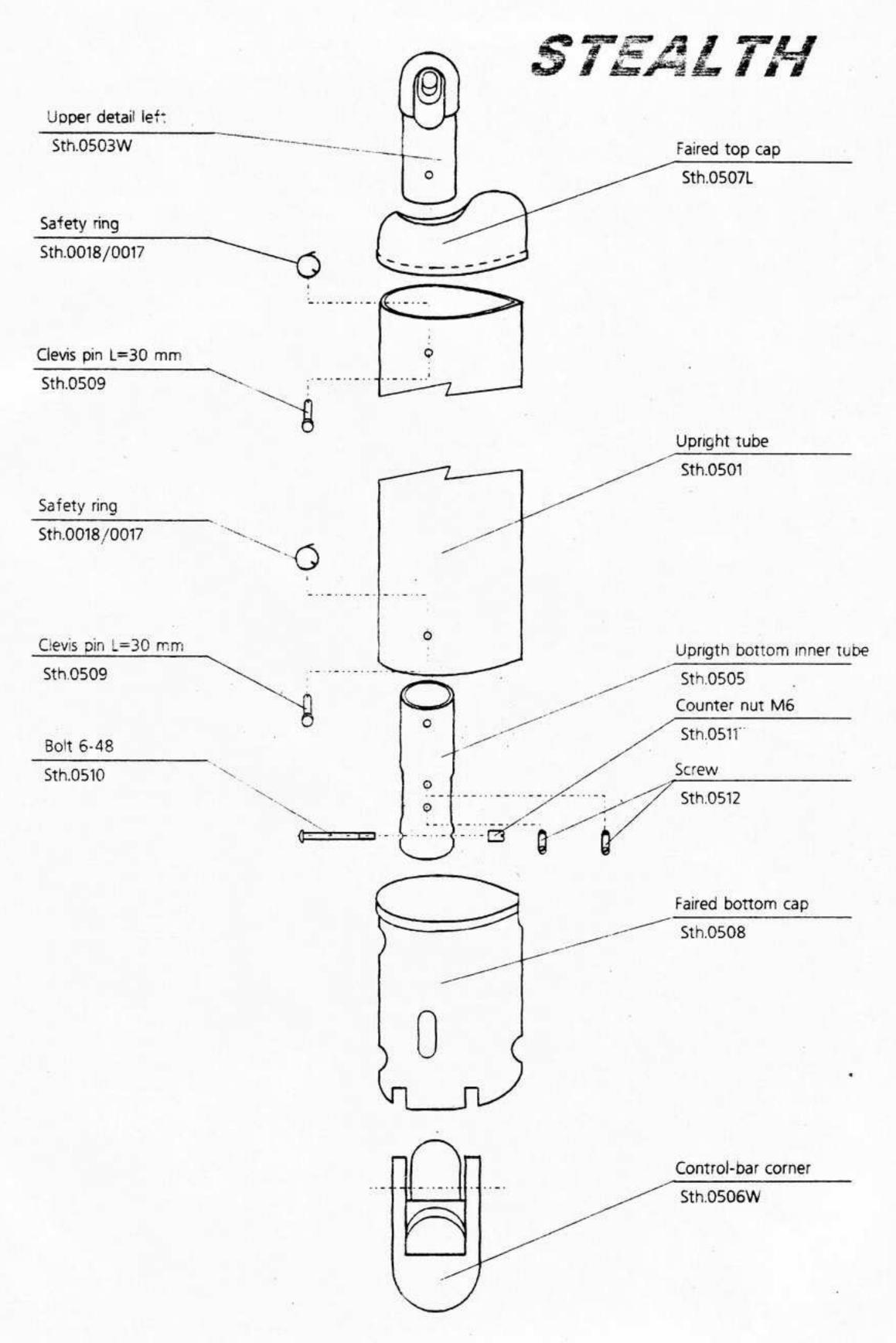




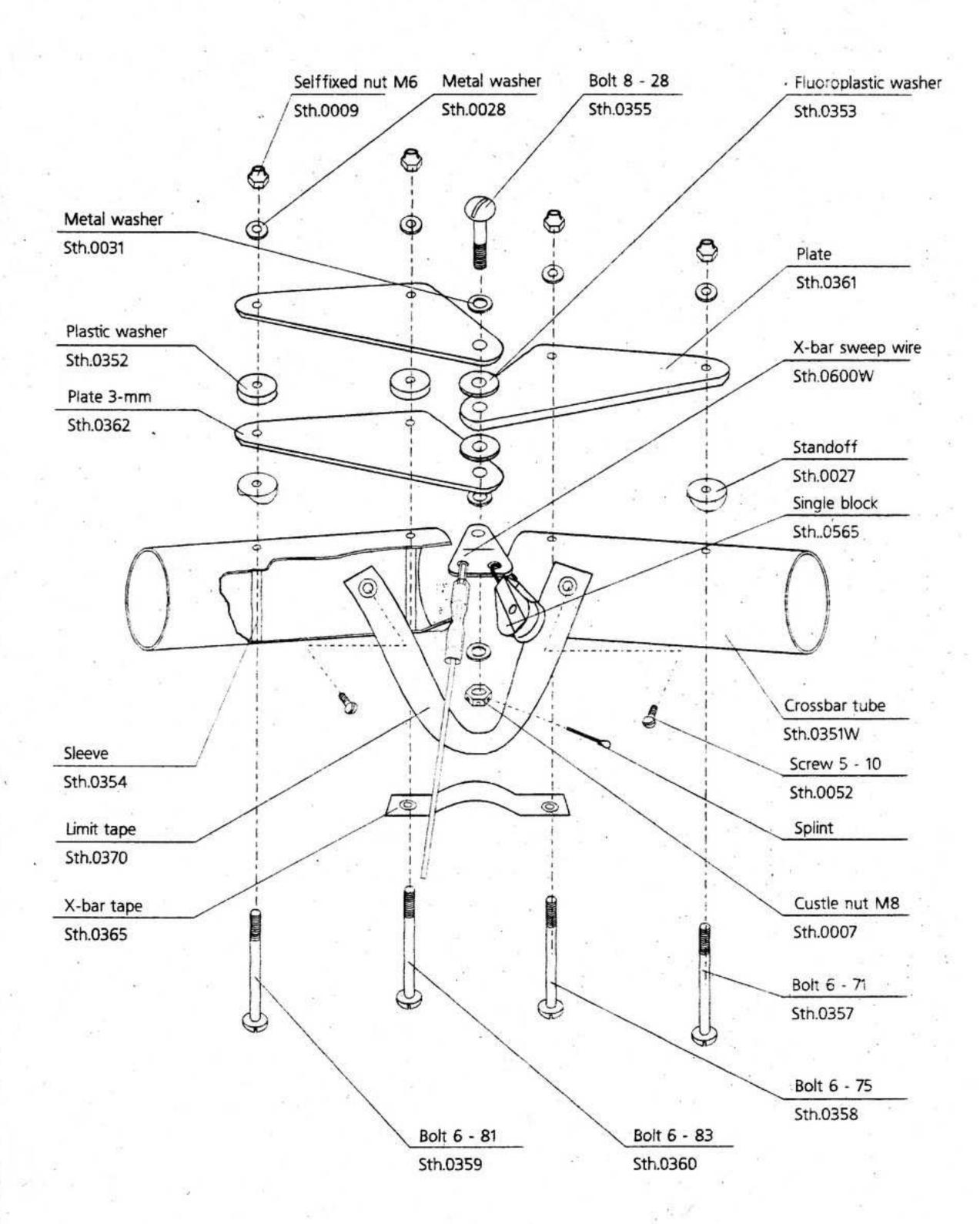




Complete right upright



Complete left upright



Crossbar Tubes Junction