

KITES FOR CONNOISSEURS

RONBUS 5-3

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RonBus 5-3 with "Double Diamond" layout.



Stack of three RonBus 5-3.

The **RonBus 5-3** kite is a single point soaring diamond for very light winds. It is not an original design by me, rather is it a tweak of a tweak: *Ron Spaulding* has often been flying a white high aspect ratio diamond kite when the wind is very light. In 2018 he tweaked it to become single point, but for some reason he was not happy with the result and he gave me permission to have a go at it. Later it emerged that the original design was by *Peter Rieleit* already in 2010, probably inspired by an Indian *Patang*. Ron's previous tweaks were to split the sail halves into four panels each and changing the fringe along the trailing edge to wider pieces. My tweak consist mainly of adding a rear in-sail dihedral (ISD) instead of fringe, a shorter kick-up front and colours. Also modifying the dimensions to fit whole Skyshark tubes: The 5-3 means it is optimized for 5 + 3 Skyshark tubes (or 32.5" arrow shafts). Naming it *RonBus* is a nod to Ron and the geometrical figure *rhombus*.

Though RonBus 5-3 is basically a light wind kite, with different bridling it has a wind range of up to 5 ms.

Material

- 4.5 m x 145 cm ripstop, 150 cm width
- Dacron by width
 - 1.5 cm - 25 cm
 - 2.5 cm - 15 cm
 - 3 cm - 25 cm
 - 4 cm - 15 cm
 - 10 cm - 45 cm
- 8 cm of 2.5 cm velcro
- 8 Skyshark tubes, P4X/P400/P3X/P300/P1x/P100
- 7 pcs long internal ferrules
- Carbon fibre or fibreglass rod, 2 mm:
 - 2 pcs 50 cm
 - 2 pcs 40 cm
- 2 pcs 7 mm end cap
- 1 pcs 7 mm T end cap
- 8 pcs 2 mm end caps
- 1 Skyshark round end nock with insert
- 2 pcs lobster claw snaplock swivel
- 1 pcs figure 8 ring, size M
- 1 pcs split ring, 15 - 20 mm
- 1 pcs rubber ring. ~5 mm

Overview

The RonBus diamond kite consists of 4 panels on each side, A, B, C and D. One reason to split up one side into four panels is, according to Ron Spaulding, to retain the grain direction of the ripstop along the leading (and trailing) edge as well as along the horizontal diagonal.

The front has a softly bent kick-up and the rear part an in-sail dihedral.

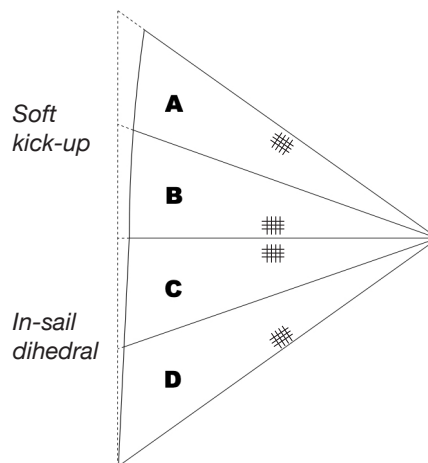
Templates

The full size templates for all four panels include an outside single hem and seam allowances between all panels, as well as the mentioned kick-up front and the rear in-sail dihedral.

This version is optimized for five Skyshark tubes for the cross bow and three Skyshark tubes for the spine, hence the name *RonBus 5-3*.

How to make it

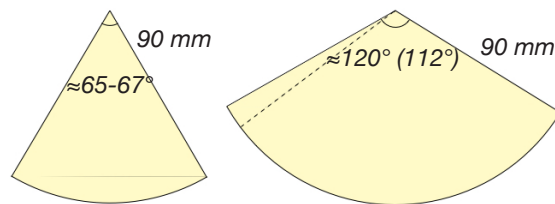
1. Sew together the four panels on one side. It is probably best to first join one A and B, then one C and D and then join these two pieces, A/B and C/D.
2. Repeat for the other side.
3. Sew the halves together.
4. Hem all the four edges.
5. Cut two tapes of ripstop in the same colour as the front panel, 65 x 6 cm for leading edge sleeve.
6. Hem the short edges.
7. Fold one tape in half along the length with a sharp crease.
8. Sew one side of the tape to the leading edge with the crease along the edge, starting 18 cm from the side corner. Sew also seams on both short ends.
9. Fold over and close the long side with a seam.
10. Repeat steps 7 - 9 for the other half of the sail.



Overview of RonBus 5-3 panels.



11. Prepare dacron pieces for reinforcements:
- Two circle sector pieces with ~90 mm radius as sides for side corner reinforcement. The sector angle is approximately 65-67°.
 - Two circle sector pieces with ~90 mm radius as sides for top and bottom corner reinforcement. The sector angle is approximately 112° for the bottom corner. The top corner angle is slightly larger. Prepare both sectors with same angle 120° and adjust to actual angle after sewing.



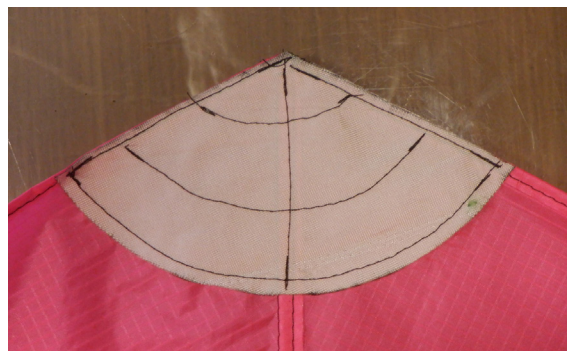
The angle of the circle sector is about 65-67° for the side corners, about 120° for the top corner and about 112° for the bottom corner.

12. Sew the side corner reinforcements circle sectors onto both the side corners.



13. Sew the corner reinforcements circle sectors onto both the top and bottom corners.

Trim the edges of the sectors.



14. Prepare dacron and velcro pieces for spar pockets:

Dacron

- Three rectangular pieces 60 x 30 mm.
- One rectangular piece 130 x 25 mm.
- Eight rectangular pieces 30 x 15 mm.

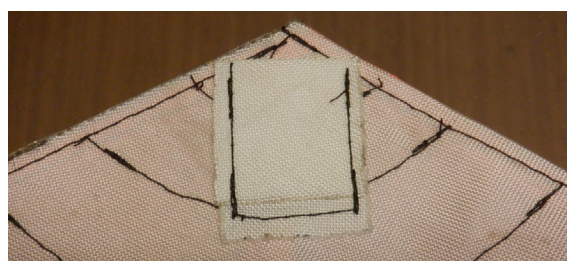
Velcro

- A piece of velcro, 80 x 25 mm.

15. Sew two of 60 mm long dacron pieces as pockets on the side corner reinforcements, facing the sleeves on the leading edge.



16. Sew the third 60 mm rectangular piece as pocket for the spine at the top corner.

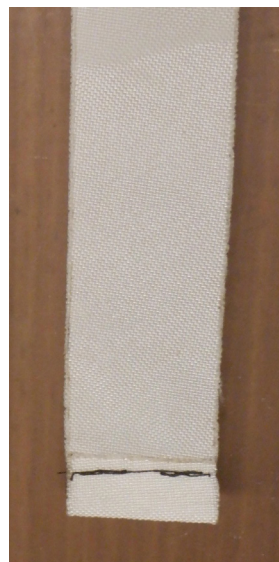


Make an adjustable pocket in the bottom corner:

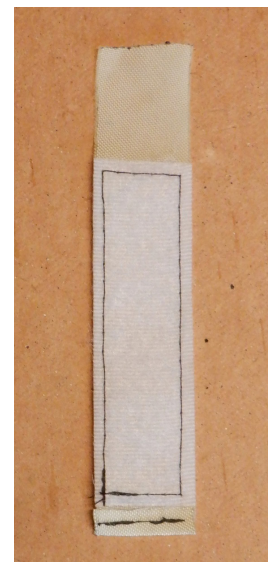
17. Cut 60 mm of the hook (hard) part of a 25 mm wide velcro strip.
18. Sew this as a sleeve onto the reinforcement at the rear corner. The width should allow the spine tube to go inside.



19. Fold over 5 mm at one end of the longer dacron tape (130 x 25) and fasten it with a seam as a strap.
20. Sew 80 mm of the loop (soft) part of the velcro strip onto the dacron tape starting just at the strap.

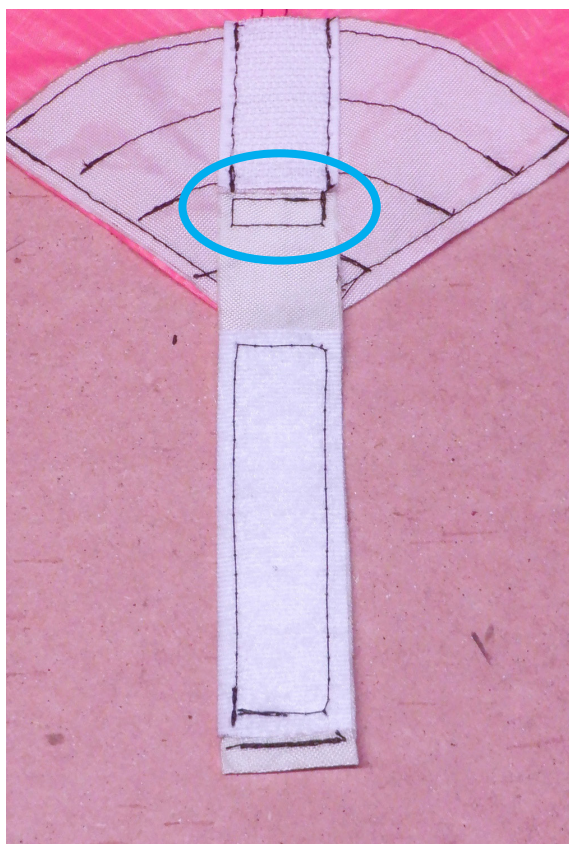


Dacron tape with end as strap.



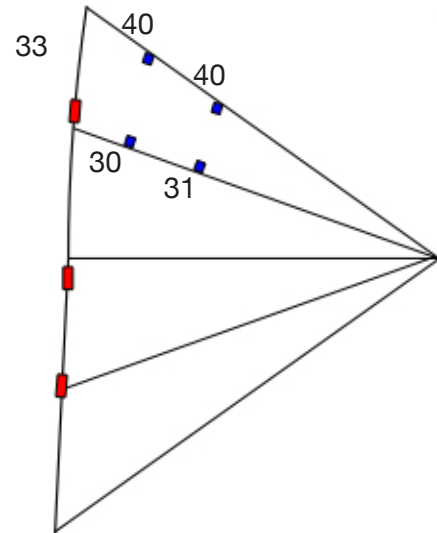
Dacron tape with loop velcro.

21. Sew 5 mm of the other end of the dacron tape onto the corner reinforcement, edge to edge with the hook velcro, with short seams. The loop velcro on the dacron tape should face upwards.



The eight smaller rectangular pieces (40 x 15 mm) are for the batten pockets.

22. Chalk marks for the pockets:
 - On the leading edge: one 40 cm from the top corner and next one 40 cm from the first.
 - On the seam joint: the first 30 cm from the centre seam and the second 31 cm from the first.



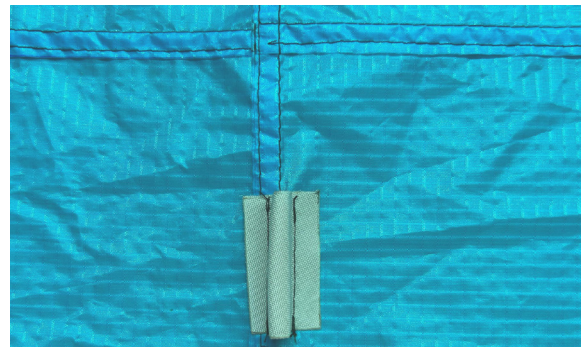
Batten pockets (blue) and spine sleeves (red).

23. Sew two pockets on the leading edge marks with each pocket opening oriented towards the opposite mark on seam joint.
24. Sew two pockets on the seam joining the two upper panels, opposite the corresponding pockets on the leading edge and oriented towards those pockets.
25. Repeat steps 23 - 24 on the other half of the sail.

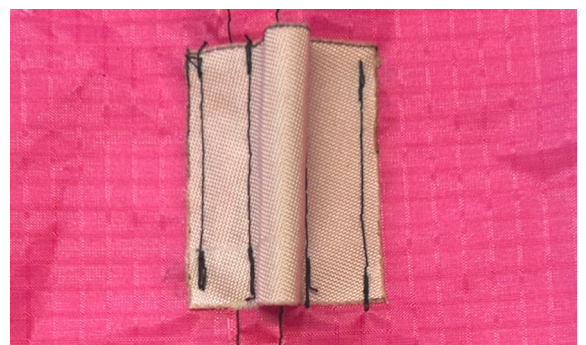


For the spine there are three sleeves and one piece of sail reinforcement for the tow point strings.

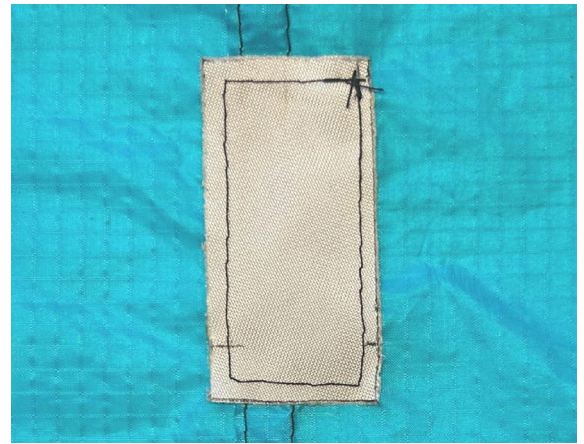
26. Cut from dacron:
 - Two pieces 4 x 4 cm
 - One piece 5 x 4 cm.
27. Sew the first 4 x 4 cm sleeve in the centre of the kite with the front edge of the sleeve 5 cm below the across seam. The sleeve should be rather tight, with a diameter of approximately 8 mm.
28. Sew the second 4 x 4 cm sleeve in the rear part of the kite, just where the four rear panels meet.



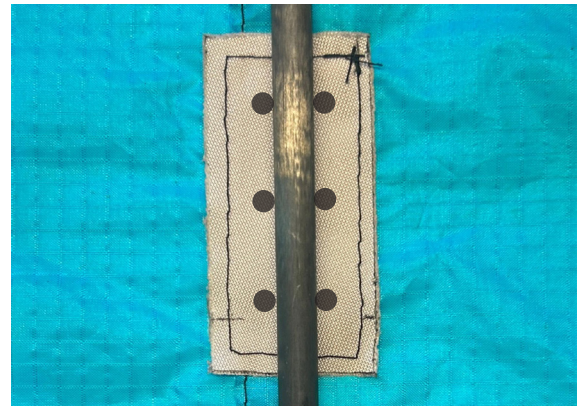
29. Sew the third sleeve, the 5 x 4 cm piece, with the front edge of the dacron piece 33 cm from the top corner in the same way. This sleeve will also work as a reinforcement for a medium wind tow point string, therefore the dacron is wider to allow an extra seam on the outer edges of the sleeve (and the holes for the tow point string).



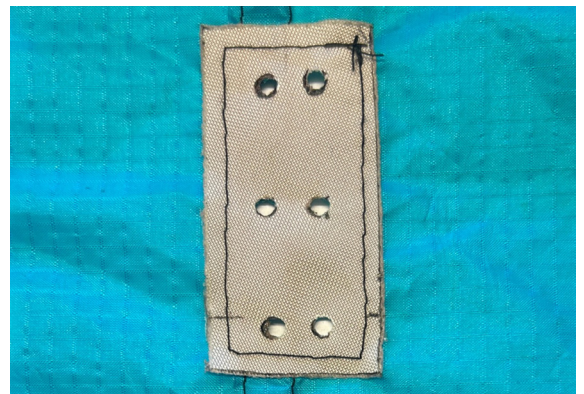
30. Cut a 6 x 3 cm piece of dacron. This will be a reinforcement for the low wind tow points.
31. Sew the dacron piece over the spine seam with the front edge of the dacron piece 70 cm from the leading edge corner.



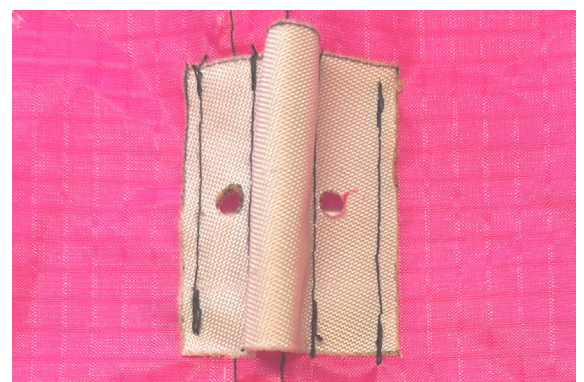
32. Put a Skyshark tube in the middle of the dacron piece as a guide and make three marks on each side of the tube, pairwise, with 2 cm intervals.
 - Front holes: low wind.
 - Middle holes: very low wind.
 - Rear holes: very very low wind.



33. Burn or punch the three pairs of holes for alternative low wind towing points in the dacron.



34. Burn or punch holes for the medium wind tow point string in the third sleeve.



35. Burn or punch holes for the strong wind tow point string in the top pocket.



Frame

The frame consists of a horizontally bent cross bow, a spine and some support spars; battens. Both the spine and the cross bow need tensioning strings; the spine for the vertically bent kick-up front and the cross spar to keep it fixed to the spine.

Spine.

The spine consist of three Skyshark tubes. The exact tube types of these are not so important, except:

- The two tubes used in the front should be softer. i.e. more easy to bend, like P90 or P100.
- The tube in the rear could be any dimension, probably preferably around P300.

36. Cut one of the two front tubes in exact half. This will be the centre tube.

37. Reinforce all ends of tubes by tying a thin string in 20 rounds around the ends.

38. Glue a long (~10 cm) internal ferrule into one reinforced end of one full length tube and both half cut tubes (not the front tube).

39. Glue a split end nock in one end of the front tube.

40. Glue a T end cap to the end without ferrule of the rear tube.

The cross bow and battens.

The cross bow consists of five Skyshark tubes with three stiffer tubes (e.g. P4X or P400) in the middle and less stiff tubes (e.g. PX3/P300) on each side.

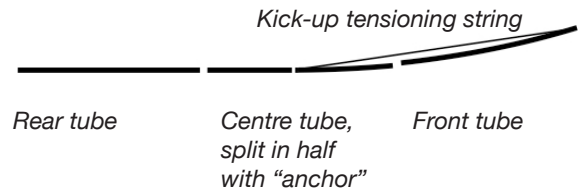
For the five Skyshark tubes in the cross bow it is suggested that the four side tubes take the internal ferrules and the middle tube remains open in both ends.

41. The ends of all five cross spar tubes should be reinforced by winding a thin string around them.

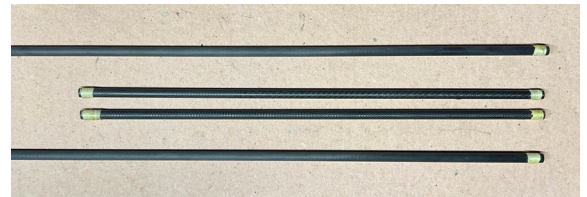
42. Prepare the four side Skyshark tubes for the cross bow with long internal ferrules (long ferrules since there is a considerable bend on the tubes).

The tube in the middle does not have any ferrule.

43. Glue end caps to two of the side tubes (PX3/P300) for the bow.



Spine kick-up front system.



Skyshark tubes with long internal ferrule and end reinforcement.



44. Cut two longer battens of 2 mm carbon fibre or fibreglass rod: ~50.5 cm (check actual required length before cutting). Glue end caps in both ends.
45. Cut two short battens; leading edge support sticks, of 2 mm carbon fibre or fibreglass rod, both ~40 cm (check actual required length before cutting). Glue end caps in both ends.
46. Insert the two longer battens in the pockets nearest to the spine, on each side of it, and the shorter side battens in the outer pockets.



Mounting the four battens is a one-time procedure: they may all well stay in place when the kite is disassembled.

Tensioning system.

Both the bow and the spine need tensioning strings: for the bow to make the leading edge taught as well as to fixate the bow to the spine, and for the spine to create the Kick Up Front (KUF). The two halved spine tubes have an “anchor” system in the middle, consisting of a split ring and a solid figure 8 ring attached to the internal ferrule between the two tube halves. Figure 8 rings are jigging/tackle material that can be found in a sport fishing shop.



String tension anchor system in the middle of the halved middle tube.

A figure 8 ring with a split ring connected to it, one lobster claw hook for the bow tensioning string and one lobster claw hook for the KUF tensioning string.

Other tensioning systems are of course also possible. Feel free to use your favourite method.

The KUF tensioning string runs from the top of the front tube to the joint of the two halved spine tubes. The top of the front tube has a split end nock, and for attaching the tensioning string in the split ring at the tube joint a lobster claw hooks is recommended: This is easy to hook up and easy to release without an unnecessary extra tensioning. A lobster claw hook of ~35 mm length of solid brass is the most easy to handle.



Details for the tensioning anchor system.

From left: split end nock, figure 8 ring, split ring, small rubber ring and two lobster claw hooks.

The lobster claw hook should be opening symmetrically at the bottom and not at the side; this to make it easier when tensioning the bow.



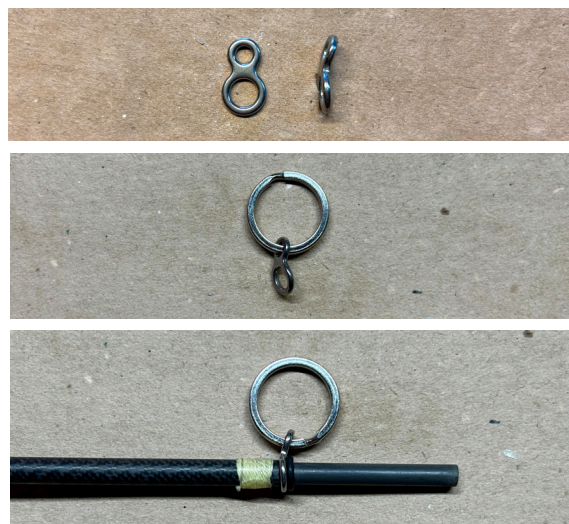
* **Round split endnock:** https://kitesandfunthings.com/Products/round-end-nocks-with-insert__2091.aspx

* **Lobster claw snap lock:** <http://www.usalanyards.com/small-lobster-claw-bolt-snap-hook-hm-8013a.aspx>

“Anchor” system.

The “anchor” system for the tensioning strings is attached to the internal ferrule in the centre tube. In this description a figure 8 ring size M with a 15 - 20 mm split ring size M with a 15 - 20 mm split ring will be used.

47. Prepare the figure 8 ring and the split ring:
 - a. Bend the figure 8 ring slightly in the waist.
 - b. Insert the 15 - 20 mm split ring into the smaller of the rings in the 8 ring.
 - c. Slide the figure 8 ring down the ferrule till the tube. The bent part should be facing the free end of the ferrule.
 - d. Lock the ring on the ferrule with a rubber ring. Put a drop of glue on the rubber ring to prevent it from slipping off.

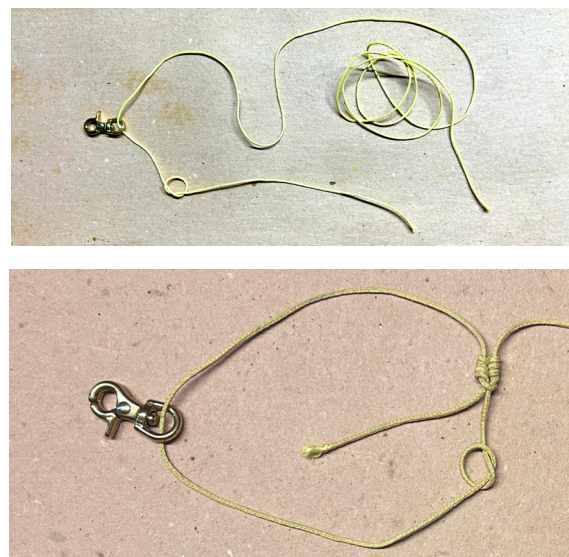


Tension strings with Prusik knots for kick-up front and cross bow.

For both the cross bow tension string and the kick up tension string lobster claw hooks are used in order to quickly and effortlessly tension the strings as well as release the tension. The Prusik knots are only used for initial (and maybe later occasional) adjustment.

Kick-up front tensioning string.

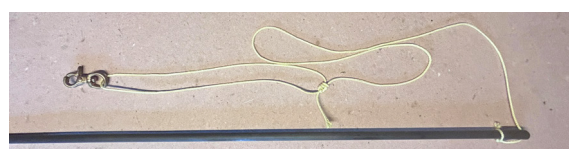
48. Prepare the string to bend the spine top:
 - a. Take a 170 cm long string of non stretch material (like kevlar) and insert one end in the ring of a lobster claw hook and tie an overhand knot 20 -30 cm from the string end.
 - b. With this end tie a triple (three rounds) Prusik knot around the string.



c. Secure the loose end from the Prusik knot by tying it into the open overhand knot to double that knot.

d. Tighten the Prusik knot firmly.

e. Tie the other end of the string just under the nock of the top spine. Put a drop of glue on the knot.



Cross bow tensioning string.

49. Take 200 cm of a string of nonstretch material (like kevlar) and tie a triple Prusik knot around a lobster claw hook in same way as described in step 48.

50. Tie the other end of the string around the split ring.



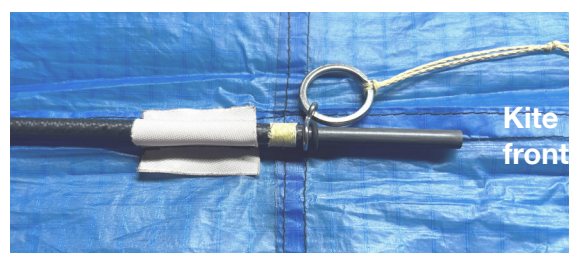
Assembling the frame.

51. Mount the spine tubes onto the kite, starting with the middle tube, then the top tube and last the rear tube.

A. The rear part of the middle tube should be mounted with the figure 8 ring on the top side of the centre sleeve and with the bent top facing the kite front.

B. Insert the split end nock with the tensioning string of the top tube in the front pocket.

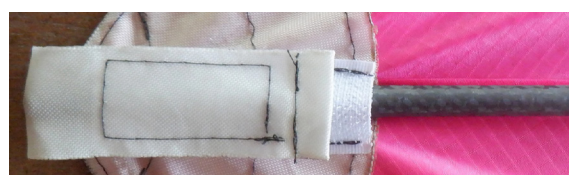
C. Insert the rear spine tube through the velcro sleeve and tighten the spine pocket with the velcro strap.



A. Rear part of middle tube with bent top of 8 ring facing front.



B. Spine top tube inserted in top pocket.



C. Spine tightened with velcro pocket.

52. Join the two side tubes on one side, slide them into the front edge sleeve and place the capped end in the side corner pocket.



53. Join the other two side tubes and slide them into the front edge sleeve but not into the corner pocket yet.

54. Connect the side tubes to the centre tube. The side tubes will extend well outside the kite.



55. Push the side tubes gently upwards/inwards so the whole cross bow bends more, until the free capped end of the tube can be slipped into the corner pocket.

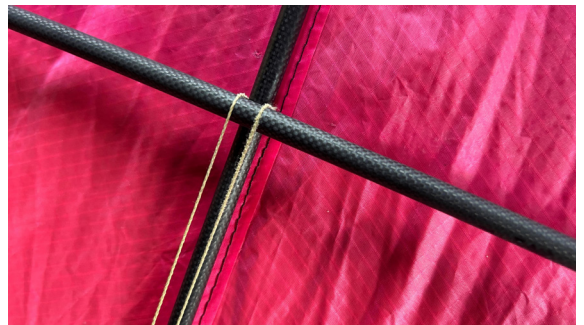


Tensioning.

Cross bow.

56. Pull the string end with the lobster claw hook from the split ring over the cross bow, under the spine and back over the cross bow again.

57. Hook the lobster claw in the split ring. Adjust the Prusik knot till the crossbow is about 40 - 43 cm from the top corner.



While adjusting the Prusik knot: unhook the lobster claw hook from the ring to make the adjusting easier.

This adjusting of the Prusik knot for correct tensioning will only be necessary for the initial assembling, as the lobster claw hook will be used for future assembling.

Kick-up front.

58. Hook the lobster claw snap lock on the string from the top corner of the kite to the split ring on the middle tube.

59. Adjust the Prusik knot and bend up the front of the kite till the top corner is raised about 20 cm.



While adjusting the Prusik knot: unhook the lobster claw hook from the ring to make the adjusting easier.

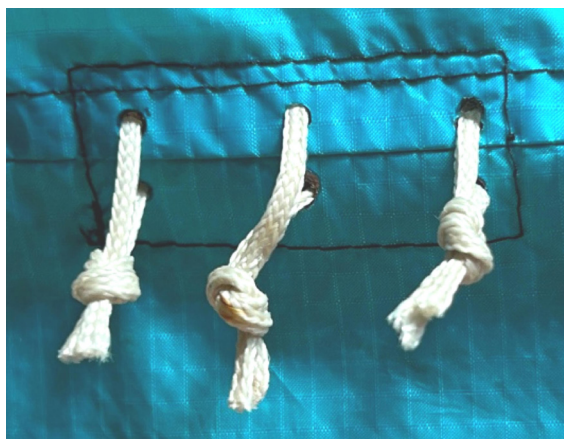
This adjusting of the Prusik knot for correct tensioning will only be necessary for the initial assembling as the lobster claw hook will be used for future assembling.

Tie alternative towing points in the prepared holes.

If several RonBus 5-3 are to be stacked (see last paragraph) choose the longer alternative for the string pieces.

Low winds.

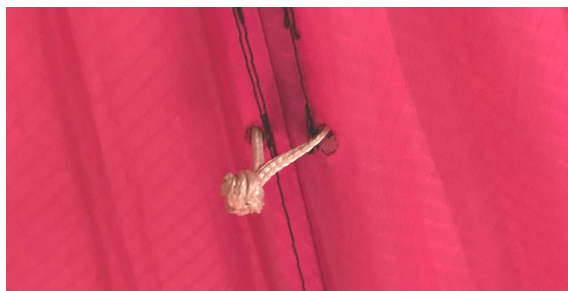
60. Cut three pieces of ~100 kg string, 15-20 cm and tie in the three prepared holes with a simple overhand or eight knot on the down side.
- Front tow point: low wind.
 - Middle tow point: very low wind.
 - Rear towpoint: very very low wind.



Alternative tow points for low winds.

Medium winds

61. Cut one piece of ~100 kg string, 15-20 cm and tie in the prepared holes in the front sleeve with a simple overhand or eight knot on the down side.



Strong winds.

62. Cut one piece of ~100 kg string, 15-20 cm and tie in the prepared holes in the front pocket with a simple overhand or eight knot on the down side.



63. Trim the strings outside the knots.

Stacking RonBus 5-3.

Since RonBus 5-3 has a single tow point it can be stacked for low winds. To facilitate this the tow point loops for low winds and medium winds must be tied with an extra knot on the upside.



Tow point loops prepared for stacking of RonBus 5-3 kites: an extra knot on the loop around the spine, below which the line to next upper kite can be tied with a lark's head.

- The kite in this figure is the one in the bottom of the stack of three on the first page, while most other pictures are of the kite in the top of the stack.

2026-03-24 Rev. 1

- Document re-structured
- Building process simplified
- Wind range increased
- Stacking added

2021-06-10 First edition