

Active 4-Point Bridle Replacement

Replacing TrickTail, Tohuwabohu, and Utopia Sliding Bridles

Martin Schob's sport kites are distinguished with a unique, Active 4 Point sliding bridle design that give the kites a number of advantages and one disadvantage - **Bridle Wear**.

Early TrickTails and Tohuwabohu used a Dacron sheathed Kevlar, (Yellow) core line that had a nasty habit of breaking without warning. Seems Kevlar does not like to be flexed repeatedly. Later models use Spectra core-Dacron sheath line. This has the advantage in that as the line wears, the sheath will start to "Fuzz" around the tow ring before the core breaks. This at least gives the pilot a visual clue that the lines are in need of replacement but these too will wear out over time.

When Martin introduced Utopia, he showed me bridles made from Q-Power 200 pound Spectra 2000 Kite Surfing line. This line has a linear Spectra 2000 core with a VERY tightly braided Spectra 2000 sheath. The line is very thin for it's strength and it is very slippery, so different knots / attachment methods will be needed to prevent slips.

It's pretty easy to twist up a new TrickTail, Tohuwabohu, or Utopia (Martin Schob's Jam Kites) bridle, especially if you are doing just the top, sliding legs. If you are upgrading to the Q-Power Spectra line, I recommend that you do the entire bridle, including the pigtails and adjusters, since the original Dacron over Spectra stuff is pretty rough textured and will promote early wear of the new line where it slides. There are 2 major lengths of line per wing that make up the upper and lower bridle legs. In addition there is a short loop of line tied, with a Prusik knot to the middle of the leading edge that serves as the angle of attack adjustment point.

To make a new bridle, first remove ONE complete bridle set so you can duplicate it. Untension the tail assembly and remove the tail spar from the spine. Working on one side of the bridle only, keep one side intact for reference, remove one bridle line from the spine. With a permanent ink marker, make a mark on the very end of this loop where it folds over. Now you can untie this loop but easily retie it to the same length.

Untie the upper bridle line at the middle leading edge adjustment point and remove the line from the tow ring. The lower bridle line can now be removed from the lower leading edge and the upper bridle and adjustment pigtail as well. Untie the lower bridle line from the tow ring, leaving the loop tied in the end that attaches to the lower leading edge. To duplicate a length of bridle I find it easiest to make up a Bridle Stick as described on Andy Wardley's web site, found at <http://www.kfs.org/~abw/kites/active/construction.html>, or use a hook screwed into a fixed surface to tension the lines while marking lengths.

When you are making up replacement bridles, here are a few tips to improve your accuracy:

Don't cut the lines to length first since they will be shortened by melting and flanging the ends. It works best to melt and flange ONE end of the line then fold and tie the loop in the end, (I standardize on a 5 inch fold over before tying) then stretch the new line alongside the old and cut it intentionally longer by about .25 inches to allow for shrinkage when flanging the opposite end. Remember you can always shorten a length of line but you cannot make it longer once it is too short!

Take the original lower bridle line and place the loop, (where it attaches to the lower leading edge) over the hook or nail on the bridle stick. Take the replacement line, melt the end carefully with a pocket lighter and flange it by pressing the melted line against the metal wind guard of the lighter. Fold the line over on itself 5 inches from the end and tie an overhand knot at the very end so the flanged end of the line serves as a stop to prevent slipping. Pull the loop tightly to cinch the knot against the flange to prevent the knot from slipping. Place this tied loop over the hook or nail alongside the original length of bridle line and stretch the two lines together. Cut the new length of line about .25 inches longer than the original, then CAREFULLY melt and flange until the two lines are exactly the same length. Stretch the paired lines tight and with a permanent marker, place a small mark on the new line where the tow ring setting is marked and where the end of the line is folded over and knotted into a loop at the spine end on the original line. Follow the above steps and make a second copy of this line for the opposite side bridle ensuring that both are symmetrical. Fold the new lines over at the spine fold mark you made earlier and knot as described above. Check for symmetry by placing all three lines, (1 old, 2 new) over the nail on the Bridle Stick then insert a standoff or a pencil through the free end loops and pull tight to check for accuracy. Retie any bridle legs that are too short or long relative to the original and recheck for accuracy.

Fold one of the new, lower bridle lines in, (roughly) half at the mark for the tow ring. Insert this folded end through a tow ring then take the looped end and pass it over the tow ring to form a larks head knot over the ring. Now take the free ends of the lines and pass them through the tow ring and under the larks head to form a Prusik knot. Make sure that the mark you made on the line remains centered over the back of the larks head knot. If you have any difficulties, refer to the bridle set that is still installed on the kite. Repeat

for the opposite bridle side.

For the pigtails, (fly line attachment points) make up 2 lengths of line that when flanged are 10 inches long. Fold each in half and tie an overhand knot in the ends pulling the loops tight to lock the knot against the flanges. Tie the pigtails onto the tow rings with a Prusik knot.



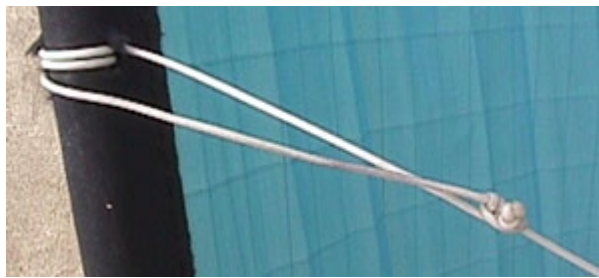
For the upper bridle you have a few options to consider. The original bridles have a short pigtail tied around the middle leading edge that serves as an adjuster. This is tied to the upper bridle line(s) and the leading edge with Prusik knots. If you are just replacing the upper bridle lines with Dacron sheathed Spectra, (like the original) then you can reuse the existing adjuster pigtail. The easiest way that I have found to retie the adjuster knot is to use one of the standoffs as a tool.

Tie a larks head knot in the free end of the adjuster pigtail and insert a standoff or other thin, short rod into the knot and pull the line tight. Slide the knot to the end of the standoff and wrap the larks head knot once more around the standoff and in the same direction. Slide the knot to the opposite end of the standoff and then wrap the opposite end of the larks head knot once more around the standoff. The knot should look similar to the photo above, left.



Pull the knot tight and while holding the knot in shape, remove the standoff from the knot and insert the free end of the upper bridle line. Adjust to factory settings and lock the adjuster knot by rolling the Prusik knot down over the upper bridle line as shown in the photo above, right.

There is another way to make an adjuster knot in the upper bridle line that eliminates the pigtail and the extra line that hangs free from the Prusik adjuster knot. Illustrated below, this is the system employed on the Utopia and consists of a Prusik knot variation that slides.



NOTE: If you upgrade to Spectra bridles, this arrangement will tend to slip, so wrap the upper bridle line twice around the leading edge as shown, then tie the adjuster knot to increase friction on the line and help prevent slipping. A light coat of beeswax can also help prevent knots from slipping. This arrangement will also affect the overall length of the replacement upper bridle line, so give yourself about 10 inches / 25cm in extra line length from the originals.