

Facnor Endless Line Furler Systems

*Installation on Corsair 31R Ahoodori with an
integral soft head stay*

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For a variety of reasons, I preferred to use furlers with an endless furling line for both screacher and jib on my Corsair 31R, *Ahoodori*. I chose Facnor SDG2000PC and Facnor SDG4000PC for my screacher and jib, respectively. This is my report on the technical aspects of their installation and improvements made through the experience on the Chesapeake Bay during the past one and half seasons. I will not elaborate on general advantages of the endless line furling system because many of the points are either obvious or have been discussed elsewhere. Instead, this memo will mainly concentrate on the technical aspects of the development of the soft head stay system and jib halyard that are compatible with the furler along with a few other details.

Furling line

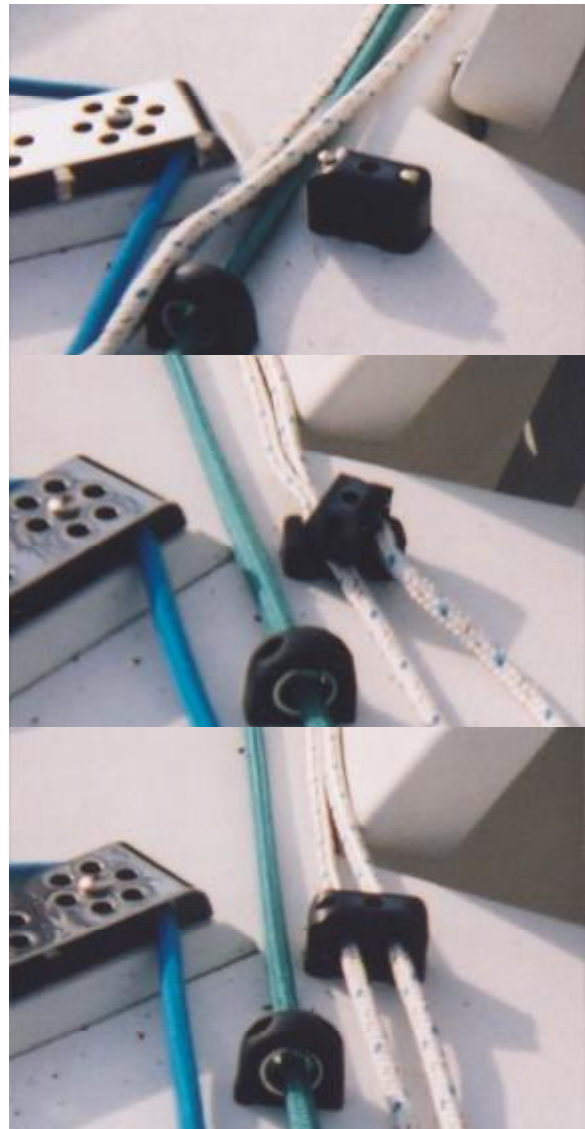
I used 5/16" double braid polyester line and end-to-end spliced to make the endless loop. For splicing, I modified the standard end-to-end splicing by tapering the core short of the splice junction. A half fid-length around the junction consisted of one cover buried into the other without the core. From there, the buried cover is tapered and the tapered end is then buried into the tapered core of the other side. The splice is then stitched along its length. The whole splice is slightly thicker than other segments, but thin enough to be able to go through the furler or the fairlead without any difficulty. The splice is weaker than the standard method, but should still be strong enough for the purpose.

Furling line fairleads

Unlike regular furling line systems, the endless furling line is difficult to put in and out of the usual deck-mounted fairlead after installation. If one uses regular bulls-eye type fairlead, they have to be put on the furling line before splicing the line into a circle, and if one wishes to remove the furler for any reason, one either have to cut the line or

dismount all the fairleads from the deck. Besides, twice as many fairleads are needed compared to a regular furler system.

I designed a "Doubull's Eye" fairlead with splitting halves, so that the furling line could be put in and out without removing the base of the fairlead from the deck. The assembly mechanism of the top and bottom halves could obviously be improved further for convenience compared to the design I used, which involves two screws to tighten the pieces together and a center screw that serves as the pivot. Regardless of the details of the design, the "splitable" "Doubull's Eye" makes installation of endless furling line system neater and more convenient.



Three photos showing the furling line fairleads



“Doubull’s Eye” Fairlead

SDG2000PC for the Screacher

This furler works well for the Corsair 31 screacher. A few small points need to be mentioned nevertheless.

The upper swivel as supplied have O-rings that function as the retainer for the pins that keeps the toggles in place. I am uncomfortable relying on the small diameter O-rings for this job, considering that failure could cause considerable difficulty in heavy weather. I use monel wire in their place and keep the swivel attached to the screacher.

Occasionally, when the screacher is unfurled by pulling on the screacher sheet without tension applied on the furling line, the furler gets jammed. This can be undone by pulling on the furling line in the direction of unfurling. I believe this happens because of the absence of a proper “peeling claw” at the furling line exit point. There is a pin at the position, but the furling line can get jammed behind it. In near future, I will make a peeling claw and replace the pin with it. This should cure this minor inconvenience.

Attachment of the furler to the bowsprit can be done one of two ways. The simplest is to directly attach the snap shackle on the furler to the tang on the bowsprit. To do this, one needs to enlarge the hole on the tang plate to accommodate the shackle. One should be careful not to weaken the plate; the hole should be enlarged downward toward the bowsprit.

Alternatively, one can install a tack line, a block on the bowsprit, and a clutch near the bow. The direct method is simple and keeps the tack position low. However, one is forced to attach the screacher while the bowsprit is in the retracted position. While sailing with bowsprit extended, one can take down the rolled screacher and store it on deck, but cannot detach the tack from bowsprit without retracting the bowsprit. The tack line method allows attachment and detachment while the bowsprit is extended, but raises the screacher tack point several inches and requires additional hardware installation. I have used the direct method so far, but may try the tack line and see which way I like better.

SDG4000PC for the Jib

This is a very nice furler and it works very well. However, use of an endless line furling system on the jib requires special arrangements with the head stay and jib halyard. No commercial package is available at present to replace the standard head stay with a package that includes the endless line furler, replacement head stay and jib halyard combination. One also has to be aware that the furler, upper swivel and the replacement head stay must withstand the full head stay load, and some makers of endless line furlers do not recommend such installations. Therefore, it is up to the owners to be aware of the risk factor and make sure all the parts of the system meet the safe working load requirement and all the components remain in good condition or be replaced as becomes necessary.

Jib luff

My jib was made by Calvert and has zipper sleeve. The width of the sleeve is about 2 and 1/4 inches. The sleeve accommodates both the head stay and the halyard set up. This way, the jib can be taken down independent of the head stay. Alternative methods include permanently building the head stay

into the jib luff (like as done for screachers), or using the standard (or in the 2:1 configuration) jib halyard to hoist the jib/head stay assembly. While these options simplify certain aspects of the installation, considering potential mechanical problems and convenience issue, We discarded these options early on.

Furler attachment to the stem

This is done by the use of a standard toggle. In principle, one could replace the eye-screw on the furler with a jaw (or fork) screw to eliminate the need for a toggle and achieve lower tack position. However, the replacement part must be custom fabricated. The locking nut for the lower screw adjustment requires a metric spanner thin enough to fit the space available. A regular adjustable wrench does not fit. An appropriate tool can be obtained through a number of supply houses for machinist's tools.

Upper swivel attachment to the mast tang/shackle

The eye screw on the upper swivel also cannot be directly attached to the heavy shackle on the mast tang on the rotating carbon mast. One could use some commercially available heavy toggle here, but instead I made a link plate that goes on the mast shackle out of a 3/8" plate of 316-SS and attached it to the upper swivel by using a pair of 3/16" link plates and 1/2" pins. This arrangement could obviously be simplified for weight saving and safety (less number of parts involved, less number of links to fail). I will consider fabricating a replacement parts here in the future. Replacement of the top screw on the swivel with one having an eye large enough to accommodate the shackle on the mast would be good. If one takes this route, the big eye-bolt probably should be made longer by a few inches to avoid the swivel body contacting the mast.

Replacement head stay

The trial head stay we tested first had a high-tech core covered with Dacron braid. The overall diameter was about 5/8", and the two end loops had

aluminum fittings with a 10 mm hole for the pin on the upper swivel and for the lower unit. I tried this several times, but decided to change it for three reasons. First, it stretched while sailing by several inches, and shrank back to the original length in the course of several days on the trailer. This made it extremely difficult to properly tune the rig. I suspect that the cover material was too short relative to the loaded length of the system and pulling the length slowly back to its liking once the load is released. Second, if the length is not exactly as one likes, the range of adjustment one can make is very limited. Third, even with the cover, single-line soft stay may not have sufficient torsional rigidity required for effective furling along the length of the luff in strong breeze. If only the bottom half of the luff roles and the top part left unfurled in heavy weather, the jib would be shredded in no time.

In order to avoid these problems, I decided to adopt the stay adjustment system developed by Erik Precourt of Canada. Erik made for me a modified version of the hardware for this purpose.



These modified Precourt System parts were designed A) to be able to mount directly onto the Facnor upper swivel and lower unit without additional toggles, B) to be able to attach the jib tack and halyard tensioner to the piece that goes onto the furler lower unit, and to work with double-line loop head stay made by end-to-end splicing a double-length 3/8" Vectran 12-strand (described below).



one could get the help of a sail maker. (I happen to be more comfortable with machining than with a sewing machine to do this by myself.) The idea behind the double line ribbon configuration is to achieve higher torsional rigidity than a single line system under head stay tension.



I made double line spacers to keep the two halves of the Vectran loop apart by 2" (outside to outside). These were made out of 3/8" Delrin plate. The upper and middle units of the Precourt system were tied onto the two end loops of the Vectran, where PVC heat-shrink was placed for protection. 16 spacers were placed in between to keep the two segments apart. This part of the head stay system forms a 2" wide ribbon. (A similar ribbon configuration assembly could be made by using a piece of Mylar ribbon of appropriate thickness as the spacer along the length of the stay, wrapping the assembly with a piece of Dacron, and sewing the two rope segments into their places at the two edges of the Mylar ribbon. This may be a neater way, if





The halyard sheave was hung from the upper Precourt system piece, and the lower Precourt system piece was attached to the middle piece with a length of 1/4" Dyneema 12 strand.



The halyard was made with 1/4" Vectran 12 strand, with a thimble at one end and a snap shackle at the other. These two ends were connected with a piece of 1/4" Dyneema cored line about 2' longer than the Vectran part to make a loop. As the jib is hoisted, both the head stay and the halyard are stashed into the jib luff sleeve and the zipper closed over them.





The halyard tensioner consists of a lever, a turnbuckle, and a snap shackle. When the jib is hoisted and the peak reaches the top, the tensioner snap shackle is attached to the thimble at the end of the Vectran halyard with the tensioner lever in the open position. Adjust the turnbuckle if necessary, and close the lever. The lower front edge of the jib where the tensioner, etc. are exposed is covered by a piece of Dacron using a piece of Velcro taped onto the sides of the jib (the jib luff sleeve terminates two feet short of the tack in order to accommodate the halyard tensioning system).