T34C Tech Articles & photos

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Developing a Cutter Rig

See Appendix E for enlarged Boom Conversion images

Making a Cutter Rig

Photo 1

Photo 2

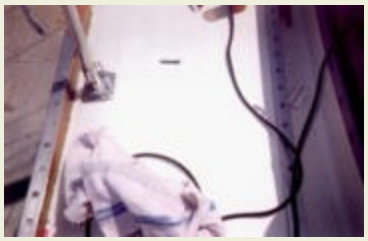

Photo 3

Why a Cutter?

Flexibility. It's a good thing to have whether you are learning the Tango, practicing yoga or sailing in the ocean. And, if it's good for your old bones among the waves, it's equally good for your rig to evince a good degree of flexibility to handle an ever-changing spate of conditions without wearing the crew down to a frazzle in the process. For these reasons, I approached the development of Temujin's rig with the idea than I wanted the good light air performance of a sloop and the ease of handling small sail areas with good overall drive of a cutter in heavy winds and lumpy seas. The answer, of course, is a cutter rig with a removable/ stowable stays'l stay and running backstays that can be stowed out of the way of the boom when sailing downwind.

Beginning with the S&S sailplan (Design # 1904), I laid out the overall design of the rig. As shown in Drawing #1, the plan of the cutter rig shows a stays'l stay running from the mid-point of the upper part of the mast between the spreaders and the masthead to the deck parallel to the headstay. This results in the stays'l chainplate being about 46" aft of the headstay chainplate.

To install the attachment points for the standing rigging additions, you will need to have fabricated: a mast hound for the stays'l stay, stays'l halyard and running backstays (this is an all-in-one fitting), three chainplates, two for the running backstays (see Photo 1) and one for the stays'l stay and tack fitting on the foredeck. (See Photo 2) In addition, you will need: a stays'l stay of ¼"-1x19 wire swaged to a quick release fitting; two running backstays of ¼" 7x19 wire, covered in white vinyl swaged to a marine eye for attachment to two sets of running backstay adjusters. You will also need a stays'l halyard and a stays'l halyard block. Lastly, you will need a fitting to permit the stays'l to be stowed against the mast and secured aft to a fitting on the coach roof when not in use. (See Note 1 for a list of parts and sources.)

It is important to point out at this juncture that the rigging plan and specifications are based on a couple of important

Photo 4

Photo 5

things. My goal on the one hand is to achieve a completely flexible rig able to use a variety of sail combinations. On the other hand, I have spec'd out the rig to withstand severe loads in extreme conditions. Initially, Temujin was re-rigged with 7mm Dyform wire all around, except for the cutter rigging which is all either 1x19 or 7x19 ss wire. The reason for Dyform was three fold. First, it is about 30% stronger than conventional 1x19 wire; secondly, it is subject to considerably less stretch, more nearly like Navtec rod rigging than 1x19 wire; and, thirdly, being in the trade at the time, I got it for what 1x19 wire would have cost. However, it is important to note that Dyform cannot be swaged but must be attached to one or another kind of mechanical end fitting, like Sta-Lok or Norseman. With all the wire spec'd at 10,300 lbs and the cutter wire spec'd at @ 7,400 lbs. breaking strength, the mast will be very well supported with everything set-up when the going gets rough. (On the original plans, the Tartan 34C lower stays were specified to be 9/32nds 1x19 wire with a breaking strength of 10,300 lbs. The boat was not built this way however.)

From the sailplan you will need to locate the three major attachment points for the stays'l and the running backstays. Once you have determined approximately where they will go, you must determine how they are each going to be attached.

In the case of Temujin I had decided that the best way to install the running backstays was to treat them as conventional standing rigging and fabricate chainplates which in turn would be through bolted to well glassed in bulkheads.

Consequently, during the process of reconstructing the interior cabinetry, I added a small bulkhead to the port side cabinets, which also served to create an additional cabinet for entertainment equipment on that side of the boat. This cabinet bulkhead is heavily glassed-in and, like the galley bulkhead opposite, serves as the anchor for the chainplates. (See: Reconstruction of Interior Cabinetry contained on this web site.)

Photo 3 shows the slots being cut into the deck to accommodate a chainplate, which is also shown in the photo. You will see two things that are a bit unusual.

First, the chainplates are fabricated with the finishing plate welded to the chainplate. This greatly eliminates the

chance for leaking. Secondly, the slot of the chainplate is cut; but the area around the slot is removed so that the section of deck can be filled with fiberglass laminate to prevent any water from entering the deck. Even the screws holding down the finishing plate do not go into the deck core but rather are fastened into the newly laminated fiberglass.

Photo 4 shows the slot finished and painted to match the rest of the deck finish. Photo 5 shows the running backstay tackle attached to the chainplate. The slot is filled with 3M-5200 and no water will get in. However, even if it somehow does, it will not get to either the deck core or the attachment bulkhead underneath. It may ruin a CD but not the boat!

When not is use the running backstays are stored on genoa track slides at the very forward end of the inboard genoa track.

Photo 6 shows the foredeck chainplate. This is a custom fabrication, which incorporates the attachment point for the stays'l stay and the tack fitting and the finishing plate in one weldment. It is attached with ½" SS through bolts, nylock nuts, pan washers and an 1.5" backing plate to the bulkhead anchor locker partition installed earlier. This installation is contained in the article entitled: Anchor Locker Reconstruction contained on this web site.

For the installation of the chainplate, the deck was treated the same way as for the chainplates for the running backstays. Again, the emphasis on keeping water out of the core of the deck. With the welded finishing plate through bolted and backed underneath in the same fashion as the chainplates, the final structure is very strong and resistant to water intrusion.

Photo 7 shows the ABI quick release stays'l stay fitting. And Photo 8 shows the stays'l stay stowed using the mast retainer and the pad eye aft on the coachroof.

The stays'l halyard is lead through a deck block and a cheek block through a sheet stopper to the old main sheet winch on the end of the port side of the coach roof. This arrangement was made possible by having changed the original mainsheet arrangement as discussed in the article T34C Boom Conversion contained in this web site. (Note: the stays'l halyard can be used to replace the spinnaker pole lift, as it will be unused when sailing down wind; or,

if you wish you can use it to fly a spinnaker stays'l downwind retaining the original topping lift.)

So there you have it. A sloop when you need it and a cutter when you need it!

To be sure, it represents a lot of work and it required that the various modifications be planned for well in advance; but, when I first got Temujin, I had a clear view in mind what I wanted. Even before I made a purchase offer on a Tartan 34C, I sat for many hours with the plans working out the rationale and the methodology for what I wished to accomplish. The objective is to provide as much rig flexibility as possible. This is very important for a small boat travelling through widely varied conditions.

We will find out how well our efforts have succeeded soon enough!

Note 1. Parts List:

1. Chainplates – 3, 1 for the stays'l stay, 2 for the running backstays. You can have these fabricated or you can buy them from Rig-Rite in Rhode Island. You will have to furnish a fitting for the stays'l tack. Note: if you read the article entitled Anchor Locker Reconstruction you will see why I'm using a chainplate for the stays'l stay. However, there are other ways to install this without building in an anchor rode partition, using an adjustable rod stay under the deck. You will also have to find a deck fitting. I think ABI makes one for this application.
2. Mast hound - a fabrication for the stays'l stay, stays'l halyard and tangs for the running backstays. (Metalmast Marine.)
3. 1 ¼" 1x19 rigging wire swaged to ½" marine eye on one end and ABI release lever on the other end. Measure to exact rig dimensions: ABI quick release lever #2145BR or 2145CH for ¼" wire with ½" pins
4. 2 pieces: ¼" - 7x19 white vinyl covered wire with ½" marine eyes at each end for running backstays (the covering is to prevent the mainsail from becoming stained.)
5. 2 each - series 40 Garhauer blocks, # 40-08S & #40-01S
6. 1 each - series 30 Garhauer block, #30-13S - Stays'l halyard block

	7. wire/rope stays'l halyard 8. deck block & cheek block - Schaefer, with aluminum sheave for wire halyard. 9. 100' of ½" yacht braid for running backstay blocks. 10. Mast fitting for storage of stays'l stay- Rigging Only # 54-500 11. Deck pad eye for storing stays'l stay

Appendix E - Boom Conversion images