Solo Mast Raising System, Com-Pac 23/IV

This system is a variation on the system outlined in the article from **Tropical Boating**
"The Perfect Solo Mast Raising System" written by Tom Ray.

http://www.tropicalboating.com/sailing/mastraising.html

The system has several features that make it very attractive.

1. It can be set up and operated easily by one person who will have complete control and can maintain visual contact with all standing rigging components.
2. It is used on the boat with no trailer involvement so it can be used on the water.
3. The components are light and short enough that it can be stowed aboard under acockpit seat.

The system consists of a gin pole with brake winch to hoist the mast up and down. At the base of the pole is a foot that connects with push pins directly to the stock tabernacle of the Com-Pac 23. At the top of the pole is an eye with a block for the line used to hoist the mast. Opposite that block is an eye for a guy line that connects to the bow pulpit to provide the resisting force. Additionally, mounted approximately mid pole just above the winch, is an eye to connect a line for a running block which attaches to the furler drum to gently move the drum aft as the mast comes down without having it drag along the foredeck. The system also consists of a set of baby stays to provide lateral stability.
These stays attach to two of the rail stanchions at the base and to a bail on the mast. The bail, attached to the mast at 6'6" above the step, is the only component permanently mounted.

The gin pole overall length is seven feet. The pole is 1.5" x 1.5" x 1/8" thk. Aluminum 6061 structural grade. It is readily available and easier to install components on than a round tube.

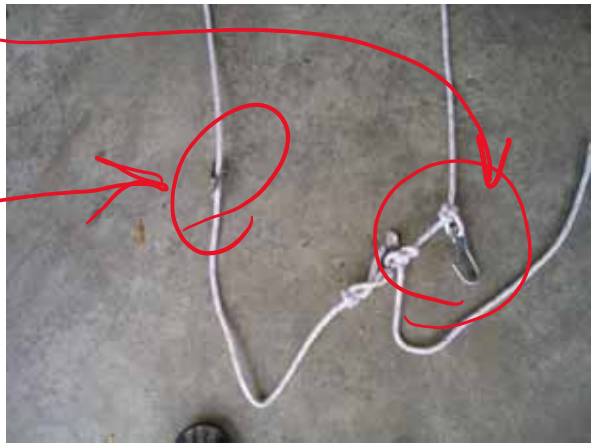
Picture of the complete gin pole:

The base of the gin pole is just wide enough to slip on to the mast step forward of the mast. The pole has a hinge pin so that it can pivot off the deck. Spacers keep it centered in the base. The two holes in the base line up with the two forward holes that are in the standard Com-pac mast step. Short, ¼" diameter spring detent push pins lock it to the mast step.

Up from the base about halfway (at a comfortable cranking level is the brake winch. It is a Dutton-Lainson DLB350A. It has to be a “brake” winch; a normal trailer winch will not work. Follow instruction manual to install and spool on the line. I used 5/16” double braided nylon line for the winch:

The next picture shows the two pad eyes using the same screws to through bolt them to the square pole. On the left side is the block for the winch line which goes through the block and then snaps onto the bail on the mast with a spring clip:

On the right side is a guy line tied to the other pad eye. This line attaches to the bow pulpit. It has a large spring clip (right side of the picture) that will allow it to go over the one inch diameter bow pulpit:



The other line in the picture above has a block that is attached to the furler drum when it is disconnected from the bow. This line is attached loosely to a third pad eye installed just above the winch in order to control the furler drum when lowering or raising the mast. Rather than bouncing along the foredeck it is elevated above the deck and ends up just above the forward hatch when the mast is fully down.

Picture below shows the pad eye location for that line on the gin pole.

Two baby stays need to be fabricated for the system. I made mine from a length of chain and some wire rope. It is important that the pivot point of the chain yoke be exactly in line with the pivot bolt of the mast. Picture a horizontal line from the mast pivot bolt that intersects the upper (center) stay on both sides In order to find this point with my mast down I installed a 2 x 4 as a temporary mast with a 3/8" hole located exactly where the pivot hole in the mast is. I installed a screw eye at the height of the mast bail with a string going down to the masthead stay tang. I then stuck a 3/8" dowel rod through the hole in the two by four and the slot in the mast step until it touched the string. From this point I measured to the base of the two stanchion bases forward and aft of that point.
This became the length of each run of chain and gave me the pivot link in the chain. If the mast is up and the bail is already installed when you are determining that dimension, you can forego the 2 x 4 and just remove the pivot bolt and follow the steps. I added spring clips to attach to the stanchion bases and a permanent 1/8" wire rope with a spring clip to attach to the mast bail:

Stanchion ends (the intersection is that point determined by the method above):

Bail end:

Although not part of the system, the Com-Pac mast step is actually a little too wide for the mast resulting in deformation of the step when the pivot bolt is installed and tightened. I installed nylon spacers to take up this space and make the pivot a little smoother:

So that's the system. All components were sized to have a minimum of 250 lbs. WLL however most are much greater. Mast with furled sail probably only weighs about 80 lbs., with a lot of that transferred to the step during operation, but there are some moments created by the eccentric load, so better safe than sorry.

You can refer to the link for the solo mast raising system to see how each component is set up on the boat pictorially. Essentially you set the pole on the boat in front of the mast, align the holes in the base with the holes in the tabernacle and push the pins in to attach the base to the mast step. Attach the winch hoist line spring clip to the bail and the guy clip to the bow pulpit, and then crank the brake winch to tension. Attach the spring clips at the ends of the baby stay chain to the appropriate stanchion bases and the spring clip on the wire rope to the bail, both sides. Detach the lower forward shrouds. Loosen the bobstay enough to be able to loosen the furler drum from the bow fitting and reattach the drum to the running block on the system. You are now ready to crank the mast down.
Going down, while cranking the winch, you will need to put light pressure on the mast until it goes over center and starts down. Raise by reversing this procedure. It will go up or down with a minimum of effort. IF YOU MEET RESISTANCE, STOP, MAKE SURE THE BRAKE IS HOLDING THEN GO LOOK FOR A SNAG.

The system in the article shows a high elevated mast crutch at the stern. This is not really necessary as the system will easily start the mast up from the stern rail. It is helpful to have about a six inch crutch primarily so that when you move the mast back from the trailering position to install the pivot bolt, the weather bump on the sliding companionway hatch cover will not interfere with pushing base end of the mast down to get the holes aligned with the slots.

The bail is the only system component that is permanently installed. It is installed about 78" above the base of the mast and has a piece of aluminum tube installed through the mast to keep it from deforming the mast at that point. Bail screw was ¼" so I used a 3/8" aluminum tube with a .305" id. To do this, on one side of the mast you put a ¼" hole and the other side a 3/8" hole then slide the tube in from the large side. This will keep any forces from tightening the bail screw or from the attachments to the bail from deforming the mast. If you want to get an idea of how this works take off your spreaders and detach your spreader tangs. That is what Com-Pac did at that point to achieve the same reinforcement.

That's it , Brack