

# SOLO MAST STEP DESIGN

Classic Lightning Design Competition  
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Submitted by:

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1967 Lippencott  
Early Fiberglass on Dense Foamcore

**Concept:** A two part stepping process using a stanchion positioned vertically to angle the mast such that it can be slid directly into the deck port. This combined with an under deck track to guide the mast foot as it as the mast is pivoted into position on the base channel.

**The Way it Works:** The stanchion is installed on the transom using pintles matching those on the rudder. The top or “cradle” is 6+ feet above providing an elevated support for the top of the mast. It is positioned so that it carries nearly all the weight of the mast. The top of the mast is placed on the cradle and scooted out far enough to align the mast shoe with the partner or mast port in the forward deck. Then, with one hand the mast is eased into the partner until it contacts the track which secures it from side to side movement. The mast is then lifted with the front edge of the opening partner acting as a pivot point. As the mast is stepped the weight shifts causing the base to slide down the track. Because the track is bevel cut at the bottom to match the height of the adjustment bolt in the base channel the mast foot drops, unobstructed, into its final position and can then be stabilized with the collars and rigging can proceed. To lower the mast all lines are detached and secured to the mast. The mast is lifted about an inch so the forward side can be placed back in the track. The mast is then allowed to rotate back. The mast weight increases as is lowered into the cradle where it rests while the foot is be backed out of the partners from where it can easily be lowered to the deck.

The idea presented has been used without mishap (or anxiety) on numerous occasions so it can be considered tested and true. I have personally stepped the mast solo in less than five minutes from the time the stanchion is installed. I am a rather thin but healthy 76 year old and this system provides me with the comfort and knowledge that I can easily step the mast alone.

## COMPONENTS

### Stanchion:

Materials: One 2x6x 8 ft (10 ft in the option), one 18" x 18" piece of ½" plywood, and a set of pintles identical to those used on the rudder.

Assembly: Shape the plywood to provide a cradle for the mast. Attach the plywood to the 2x6. Secure the two pintles to the 2x6 aligned to fit securely into the existing gudgeons on the transom.

Note: Depending on the length of your partner opening the height of the cradle must be increased. For my boat the design uses a 9" opening in the deck. If the opening is reinforced with a tall wood casing the piece at the underside front edge should be trimmed back to about 1" to allow the mast to be inserted at the lowest slope reasonable. To determine height required for your boat you need to determine the entry angle by ripping a piece of 2x4 to 3.25" (or to match the size of your mast) to make a mock mast and insert it into the opening and rotating it until it is tilted back as far as possible. That will give you the angle. You can then compute the minimum workable height for the cradle.

### Track:

Materials: One 2x4x 3 ft for the bottom of the track, cut to required dimensions and shape on ends, and one 1x6 x 6 ft to form the track sides or guides.

Assembly: Rip the 2x4 just wider than the mast foot. I allowed ¼" wider. My oval aluminum mast is 2.5", but the shoe is about 3" so my track is 3.25". Bevel cut the end of the 2x so it snugs up to the front of the bolt in the existing metal receiving channel that sits on the keel. Secure the track assembly at about 45 degrees making use of whatever is in your boat already to secure it in place. The track guides the mast foot down the track allowing it to drop right into its slot without getting hung up on anything. The track sides hold the mast in proper alignment so it is not necessary to balance it from side to side while stepping it.

## **STEPPING THE MAST**

### **Stepping:**

1. Insert the pintles on the stanchion into the gudgeons on the transom.
2. Place mast on deck. Get on deck and raise the top of the mast up so that the top of the mast rests on the cradle and the foot of the mast rests on the forward deck.
3. Slide the mast back over the cradle to bring the mast shoe in line with the deck partner and place it into the partner opening. At this point the mast is secure on both ends.
4. Slide the mast into the opening until the shoe fits into the track below the deck.
5. Lift the mast off the cradle and slowly walk it up, applying pressure to the mast to pivot the foot sliding it down the track. When nearly vertical the mast base will slide off the track and drop the final inch into the receiving channel.
6. Install chocks to prevent forward and backward movement of the mast.

At this point the stepping is complete and the rigging can proceed as normal.

### **Unstepping:**

1. Remove all stays, etc. and bungee to the mast.
2. Lift the mast about an inch allowing to place the edge of foot against the track.
3. Walk the mast down lifting it a little to loosen any friction, setting the end of the mast on the cradle.
4. Back the mast out of the deck partner and place it on the deck.
5. Lift the mast off the cradle and lower to the deck.

The cradle is the only moving part. It goes in the boat when traveling and stays with the trailer while sailing. It could be manufactured of aluminum tube with the pintles welded on and the cross bar assembled of similar materials, possibly allowing the cross bar to be rotated for easy storage, much like a spinnaker pole.

## **DIGITAL ENCLOSURES**

### **1. Narrative.**

### **2. Two Drawings**

- a. Section of boat with stepping assembly to scale.
- b. Detail of the deck partners and the track assembly

### **3. Photos and “movies”**

- 1- Photo of the stanchion prototype showing the pintles and the collar.
- 2- Photo of the track under the deck.
- 3- Photo of the mast placed on the cradle.
- 4- Movie of the mast shoe being inserted in the in the mast partners.
- 5- Photo of the mast shoe in the partners ready for stepping.
- 6- Photo of the mast shoe in position for stepping from above the deck.
- 7- Photo of the mast shoe in position at the top of the track from under the deck.
- 8- Photo of the mast shoe placed in the metal mast channel on the keel.

Below are movies of the first time I tried out the design.

- 9- Movie showing the first time stepping the mast.
- 10- Movie showing the mast being slid through the partners to the track.
- 11- Movie showing the mast being “unstepped”.

Note that in these early movies I don't have the standing rigging secured well to the mast, something that was easily accommodated. Its simply a matter of “knowing what you are doing”. Overall, in that first attempt I came away happy and pleased with the overall simplicity of managing the mast weight, height, and balance. It is a simple process now.