

BUILD YOUR OWN KEELBOAT HAULING TRAILER

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Designer Garth Wilcox with finished keelboat hauling trailer

WHAT DO YOU DO in a remote location when you need to haul your boat and your only option is to hire an often broken crane at incredible expense? My husband, Garth Wilcox (PNW), and I were faced with just such a predicament when we stopped in Kwajalein, a remote U.S. Army base in the Marshall Islands, after four years of cruising. We'd just fried all our electronics in a voltage spike in the Solomon Islands. Replacing this essential navigation equipment wouldn't be simple or cheap. By a stroke of luck, we'd managed to secure jobs as contractors to help defray the expense and buy us the right to linger in this heavily restricted, remote location. It offered an oasis of sorts thousands of miles from anywhere, but it had its limits. Atolls don't offer the most secure anchorages.

When the trade winds piped up, we cringed as we watched our boat and others roll from gunnel to gunnel, often flashing a bit of keel as they leapt out of the water. After several months moored where a steady wind-whipped chop battled against ocean swells from another direction, our boat would take a beating. Tales of broken gear from the continual motion during last year's windy season were long and detailed. And working on our boat under these conditions was out of the question. We needed to get *Veleva* out of the water as soon as possible.

We watched with envy the trailers on the boat ramp that easily yanked runabouts out of the water between boating adventures. If only we could use something like that, we thought. We weren't alone. Several other bluewater voyagers had also stopped here to work, including our friends Bob Trahan and Robin Ridout on a Block Island 40, *Misty Dawn* (formerly *Reindeer*).

Garth and Bob, veteran offshore sailors who pride themselves on self sufficiency honed over thousands of oceans miles, combined their strengths to devise a home grown solution: building a cross between and trailer and a marine railway—a marine railway on wheels. The idea had some appeal and soon they had interest from the 20 or so other local sailboats facing the same challenge. First, they measured and re-measured the water depth and checked the topography at the bottom of the boat ramp and then calculated the tides to figure out how realistic this idea might be.

It was a tall order:

1. The design needed to be adjustable to suit a wide variety of boat lengths, beams, and keel shapes.
2. The boat had to unload from the trailer without any additional equipment.

3. Whatever they built had to be strong and last in a heavily corrosive environment due to the salt air.
4. They had to build from parts they could scrounge on a remote island atoll in the middle of the Pacific Ocean.
5. They were both working 40 hours a week.

Garth Wilcox, a respected MIT-trained, certified Naval Architect, “busy” from 7:30am to 4:30pm designing work-arounds for crummy kitchen ventilation, put his engineering skills to work on designing. Bob Trahan, a fine wood craftsman who'd built multi-million dollar homes in Aspen, now underemployed repairing rotting church pews and building picture frames for senior management, began searching far and wide for parts they could use to fashion a design suited to their purposes.

Garth and Bob called in favors from friends with the right connections or skills to get boat and part measurements, find parts, get them moved, or identify necessary refinements to their design—anything that could help them make progress. Ordering parts to be shipped in was out of the question, so they spent countless evenings and weekends riding around on their bicycles looking through the junkyard and under bushes. The design complexity and volume of work easily quadrupled because raw materials were so scarce. Eventually they accumulated a stack of rusty metal—discards from old projects—and hauled it to a large field where a skilled welder—bored with welding heavy equipment that should have long since been retired—contributed his welding talent and equipment.

On the first day of building, Garth and Bob bicycled to the welder's shop where the parts had been centralized. In an open field with not a breath of air, wearing long pants in 87 degree heat, Garth and Bob set about learning how to use a torch to cut sheets of steel that were too heavy to move. Within about two minutes of picking up

Materials:

- (2) 4' by 8' sheets of steel, 5/8" thick (about 900 lbs.)
- (2) 40' long 14" I-beams
- (2) Wrecked axles from an old rusted trailer that had gone off the end of a pier
- A lifting frame for tilting up pre-cast slabs
- 20 feet of 5" rusted steel pipe
- 20 feet of 6" rusted steel pipe
- Several lengths of 6" I-beam
- Some condemned scaffolding legs
- A bucket of 3/4-inch stainless steel bolts and nuts (approximately 160)
- 200 lbs. of welding rods
- Wheel nuts
- 6 tires
- Shackle
- Gifts for key contributors to the project
- A hundred gallons of iced tea



Trailer ingredients

a cutting torch, Garth saw flames leaping back towards his hand from a gas leak in the torch tip. They had only just begun the long hard slog and Garth was already bicycling to the hospital to get treatment for second-degree burns on his hand. Fortunately his hand healed quickly and was back to normal within two weeks.



More ingredients

They quickly learned how taxing steel cutting would be on their backs as they hunched over huge sheets of hot steel, trying not to touch them. Remember the long pants and the 87-degree breezeless heat? The steel was so heavy that a piece approximately three feet by two feet was barely moveable and the availability of heavy equipment to move and position pieces was critical. Each cut took about a minute per inch of steel. Each weekend day, they rose at 6 a.m., met for breakfast, then made their way down to the work yard. With a half hour for lunch and a quitting time of 6:45 (just in time to get to the dining hall before closing time), they steadily worked away in the intense heat. Some work evenings stretched until 10 p.m.



Preparing to weld



Getting help welding



Drilling holes



Aligning holes for side supports

The financial investment to build the trailer wasn't high, since most of the parts were salvaged from scrap, although some parts had to be purchased. However, the labor to turn a rusty hulk of useless junk into a valuable vehicle for hauling and transporting a keelboat weighing up to 32,000 pounds was enormous. The time invested in gathering parts, measuring, and designing (and re-designing) totaled about eight months. The back-breaking labor to build it took six sweaty months. Finally they had a mammoth beast



With side supports installed

bother with a set of reinforcements in the original design. So, the day before the haul out they spent a blistering day straightening the trailer with a sledgehammer and a hydraulic press, then welding in those reinforcement pieces that could have saved them the heartache, had they not been tempted by laziness. By the morning of the haul-out they were exhausted. But the tide was right and volunteers were ready.

Bob, Robin, and I headed out to *Misty Dawn* and readied her for her voyage to shore. Garth stayed ashore to coordinate the ground crew, which entailed hooking up a front end loader and towing the massive trailer to the boat ramp, then guiding a team of folks in the water in mask and snorkels to man the pads attached to the uprights, which would support the hull.

Most of the tiny island population gathered at the top of the ramp, cameras in hand, to witness this event, which had the potential to usher in a new era for sailboats or turn into a mess on the ramp. A 30-foot cable stretched between the front end loader and the trailer, to keep the equipment out of the salt water as much as possible. The trailer slowly backed down the ramp into the water. Garth, now in mask and snorkel, had to make sure it didn't back off the end of the ramp. He'd estimated how

An overview of the construction process:

- Sandblasting steel sheets or beating rust off with hammers
- Cutting steel into 100 pieces
- Smoothing edges of the cuts
- Coating steel with paint to protect it from rusting
- Grinding off paint from steel where welds needed to be
- Drilling over 300 3/4-inch holes into crossbeams and frame or rails
- Moving the steel into place with heavy machinery
- Aligning steel pieces with block and tackle
- Bolting crossbeams to frame or rails
- Clamping reinforcement pieces to hold them during welding process
- Cleaning and welding each seam
- Building outriggers onto rails for adjusting to various boat widths
- Grinding the rust off the axles and cutting them in half
- Placing and welding axles into place
- Placing wheel on the axles
- Measuring and cutting uprights that boats will tie to and rest between
- Measuring and drilling holes in uprights for height adjustable bars (for bracing pads)
- Welding the uprights
- Cutting short lengths of pipe for adjustable bars
- Cutting pads and carpeting for bracing against boat hull
- Cutting pads for bracing keel
- Welding trailer hitch
- Designing, cutting, and welding steel skids to provide support to the structure when the crossbeams are removed
- More grinding & welding



Garth and wheel axles

that closely matched what Garth had designed. But the moment of truth had come – could it actually do the job? To test its load bearing capability—before risking their precious sailboats— they hired a crane to place concrete blocks weighing about 32,000 lbs. onto the trailer, then hauling that massive weight up and down the boat ramp. The trailer groaned when the weight was set upon it, but the test went off without a hitch. Or so they thought. . .

They scheduled a haul out of Bob's boat, *Misty Dawn*, a 27,000 lb. full keel Block Island 40 for the following weekend. As they began to adjust the trailer to the dimensions of its first candidate, they realized that during the load test, the frame had bent. A pitfall of having the designer also fill the role of manual laborer is that he was tempted to cut a corner and decided not to



Trailer in tow

much water there was at the bottom of the ramp and it looked good. He relayed the go-ahead by VHF to the crew afloat. *Misty Dawn* gracefully made her way towards the four lonely upright posts that stuck out of the water. A group of frogmen stood by. Under Robin's gentle hand, *Misty Dawn* made a regal arrival, but that was the last of her grace. Like a beached whale, she made an awkward transition to being on land.

In the nerve-racking position as owner of the boat in this vulnerable state, Bob took the lead directing the crew and the driver of the towing vehicle. The swimmers worked frantically to ensure the keel was aligned and readjust the pads attached to the uprights to accommodate the flare of the hull as the boat settled on the



Positioning pieces



Weight test while loading weights



Bob and Misty Dawn



Without trailer support

trailer. Bob, Robin, and I climbed off the back into an awaiting dinghy for the short trip to shore. Once Bob and Garth finally felt confident that the boat was positioned well, Bob directed the driver to gingerly back up the ramp. The magnitude of the trailer seemed to grow as this massive hulk emerged from the water.

At the top of ramp, they stopped briefly to chalk the wheels and remove the stretch of cable separating the front end loader from its tow. Soon the front end loader was ready and the steady beeping of its backup signal began as its driver shifted into reverse. *Misty Dawn*, under tow, led a slow parade of bicycles past the four way stop at the baseball diamond, past the tiny airport, the fire department, the fuel depot and the power plant. *Misty Dawn* dwarfed a school bus as the two passed port to port. In a place with no overhead power lines and few trees, we encountered few obstacles, but we did have to detour around a couple of overhanging tree branches to avoid taking out her rig. In front of the boat shed where *Misty Dawn* would sit while she received some TLC and paint, a crowd set up a line of chairs to watch the rest of the show as she was backed in. After *Misty Dawn* came to a stop, everyone celebrated this momentous occasion with champagne and a barbecue as though the work were done. Garth and Bob knew otherwise.

Getting the boat off of the trailer was a critical step to success since the trailer was scheduled to haul our boat, *Veleva*, the next weekend. The following day was spent rounding up wood

blocks and jack stands to support *Misty Dawn* in place of the trailer. They slid huge wooden blocks under the keel between trailer crossbeams. Once the keel was adequately supported, they removed the crossbeams aft of the forward axle by unbolting them from the trailer side rails and dropping them out the bottom. Then they placed jack stands at key locations to support the hull and loosened the side support pads that were attached to the uprights. Once this was done, they were able to jockey the jack stands around the axles to provide support as the trailer slowly slid out from under the boat.

Without the crossbeams, the weight of the uprights on the empty trailer was significant and skis bolted to the underside of the rails on either side helped to support the shape until the crossbeams could be replaced. The trailer could not travel far in this state, but was instead backed into the next lot where they could realign the frame and bolt the crossbeams back on. They devoted hours to the tedious process of pulling the rails together with a come-along, then putting in all the bolts. Often the bolts would only fit with significant jimmying. (Typically the ones on the rails would fit but not the ones on the wheel assemblies. An axle beam required four people to move.) Then they used a hydraulic jack to untwist the rails so that the remaining holes would align. Slowly they tightened the bolts with crescent and socket wrenches. They were finally done, but only with the haul out of the first boat. Yet before *Misty Dawn* was even settled, someone expressed interest in buying Garth and Bob's new contraption.



Full keel on trailer



Adding cross beams



Veleva coming in

They agreed on \$10,000 and a new boat-hauling business was born.

With the trailer now unloaded and reassembled, Garth and Bob spent the next few evenings adjusting the trailer to handle its second customer, *Veleva*, a light displacement cold-molded wooden boat that could hardly have been more different. *Veleva* is nearly 10 feet shorter than *Misty Dawn* with a narrow fin keel. Garth designed a set of additional props to support the aft end of this much smaller boat, particularly as the boat trailer moved up the sloped ramp. Because *Veleva* was so light (only 10,000 pounds),



Veleva launching



Underbody with cross supports missing

each time the crew moved to make an adjustment, the keel bounced around relative to the trailer. It took some time for the boat to settle and to position these supports. Once she finally came out of the water, the adaptability of Garth's design was proven. After *Veleva* was positioned alongside *Misty Dawn*, we repeated the tedious process of supporting the keel and replacing the trailer supports with jack stands, and then removing the crossbeams to ease the trailer out from under the boat.

Now the real work could finally begin. ✦

Wendy Hinman is a regular contributor to sailing magazines. One of her pieces has been published in the anthology, "We Came to Say." Another of her stories won a Solas Traveler's Tales award for best travel writing. She is the author of "Tightwads on the Loose," a book about her 34,000-mile, seven-year adventure to 19 countries aboard a 31-foot boat with her husband. She is still married and still happens to like him.

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Bob and Garth