

## SUPER POOPER FOR YOUR LUDERS: INSTALLING THE AIRHEAD

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A lot of members have expressed interest in the project I did last Spring. Faced with new Massachusetts laws that made my Lectrasan illegal, I was faced with the prospect of finally installing a holding tank. I was not happy about the loss of storage space, the inconvenience of finding a pumpout, and the potential disaster of a leaking tank. As I sat complaining to my friend Steve, he said “You need an Airhead”. After making the expected joke, I asked what he was talking about. The Airhead is a composting marine head. The company’s website is informative, and includes dimensioned drawings: <http://www.airheadtoilet.com> Steve reported that the system was without any offensive odor, and held one season of ‘donations’ which provided compost for his garden the following Spring (several weekends and a 3 week cruise).

Although I trust Steve’s judgment, I did some research of my own on the web, and found a number of favorable reports. See the following links: <http://www.sailsarana.com/FAQ.php#why>

Ross Faneuf has summarized the pros and cons nicely at:  
<http://forum.woodenboat.com/archive/index.php/t-63264.html>

### Air Head pros:

1. Cleaner and less smelly than a conventional toilet. For the most part, easier to clean.
2. Easier to use - really. This is true in rough weather as well.
3. Doesn't clog. Doesn't leak. Doesn't drip.
4. If someone doesn't obey the rules, and puts in something they're not supposed to (like a tampon), the result is unpleasant rather than catastrophic.
5. Much less cluttered installation - effectively more room in a small head, like ours.
6. You get to freak out conventional boaters, who think you're weird.
7. You get to give the Coast Guard interesting answers when they ask about the position of your discharge y-valve.

### Air Head cons:

1. You end up with a lot of pee to deal with; we typically empty the urine tank over the side. Since it's sterile, this isn't a big deal, but we don't really want to advertise, either.
2. You don't ever want to let the urine tank get to the overflow point.
3. You have to carefully explain how to use it to guests. Come to think of it, this is a con for conventional toilets...
4. You get to freak out conventional boaters, who think you're weird.
5. You get to give the Coast Guard interesting answers when they ask about the position of your discharge y-valve.

I launched at the end of July 2010, and we took a 2 week cruise to Maine, followed by several weekend cruises before hauling in October. We both feel the Airhead is a big improvement over the conventional system. In addition to the pros listed above, I would add some. The head area is much easier to keep clean; there are fewer holes in the bottom of the boat; I don't have to deal with freeing up a 1 ½ inch seacock in an awkward and smelly location each Spring. The only real con is that with 2 of us, we had to empty the liquids container every day.

There are competitors to the Airhead, the most similar is the Nature's Head – apparently this is a very similar design made by a guy who used to work for Airhead and struck out on his own. It's about 10% cheaper than the Airhead – obviously not enough difference to base a decision on – you're going to have this a long time. The Airhead is made by Geoff Trott, who will personally deal with your questions by email or phone. I rate the service as A+.

Frankly, I think the Airhead is terrific. No smell, easy to clean, little to go wrong, no need for pumpout boats, takes up less space than a holding tank or Lectrasan.

## Installation step-by-step:

1. Remove the existing head and associated plumbing. Since the boats will all have different installations, it's up to you to figure this out. My prior existing installation is shown in the photos below for comparison with the final product:



2. Remove the raised shelf the head was on. As the interior work on the Luders was mainly screwed together, this is a fairly simple operation. While there was no shelf installed, I removed the 1 1/2" effluent seacock. The thruhull would not unscrew – I applied enough force to shear off the wrench tabs – Uh Oh. Solved the problem with my trusty Dremel and a cutting wheel. From the outside of the boat I ran the cutting wheel around the inside of the thruhull just above the flange. 3 min later, presto! Flange off, seacock removed. Clever, huh? You can also see some brown epoxy putty I used to eliminate a low spot where shower water tended to collect and escape the sump pump. I also took this opportunity to repair the bulkhead tabbing with glass and epoxy – it had suffered a bit from 4 decades of dampness in the sump, though the wood was sound. The bronze bolt protruding through the hull is the connection to the lightning ground plate I installed.



3. Install new shelf supports. The Airhead is 4" taller than the standard Raritan PHII head I had. I built a shelf 4" lower than the original so the seat height remained the same. I removed and discarded the old shelf and the wooden cleats that supported it. Below you can see the new supports installed 4" below where I marked the old supports. Note that there is no support in for the forward outboard corner – the new shelf is supported at this point by the sole. Final adjustment of height here was done by shaping the bottom of the shelf corner. Here you can also see the capped plastic thruhull I used to plug the old hole. I also glassed the outside. I did it this way because I thought I might not like the Airhead and want to reopen the hole. It won't be necessary.



4. I made my new shelf from 1" thick 17-ply marine plywood, coated with West System epoxy to make it easy to clean. This plywood is strong enough to support the weight of anyone who can fit into the head, so I did not recreate the front vertical support. This gives better access to the shower sump. The new shelf is held in place by a block on top in the rear, and by two barrel bolts. It can be removed in seconds for cleaning. You can see the mounting brackets for the Airhead in the left photo. The notches in the shelf on the aft and the inboard side are for the lightning ground wire and the sump pump pickup tube respectively.



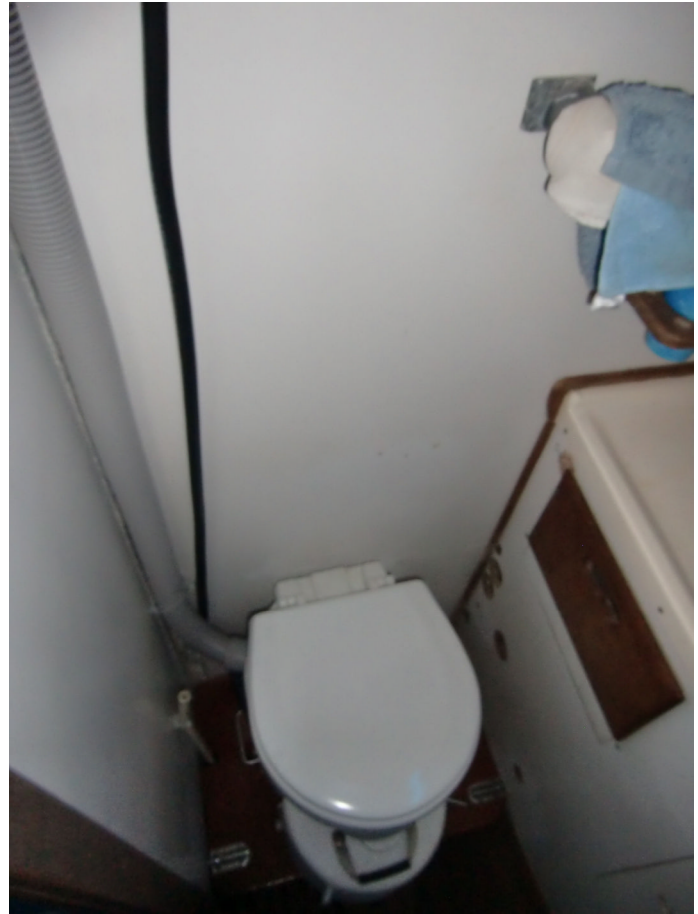
5. Below you see the Airhead in place. Amazing reduction of clutter – it is much easier to clean this area now – no stinky hoses and complicated pumps.



6. There is no plumbing to install, but there is a 2” vent with a small fan that runs continuously. This required more thinking than any other step. I had hoped to install a Nicro solar powered day&night vent, but there is an aluminum plate under my mast step (another story) that leaves no room to install such a vent. My solution was to make a traditional looking inverted U vent from standard 2” copper plumbing fittings, and install it next to the Dorade box. I made the hole through the deck with a holesaw, removed half an inch of balsa core all around the hole, and filled the core with epoxy putty. At the same time, I filled the space between the overhead liner and the deck with epoxy. You don’t want either salt water or vented gasses to have any possibility of getting into these spaces. As you can see, the new vent is the same height as the Dorade box, and is supported by a shaped wooden block screwed to the box. It is strong enough to support a heavy deckhand standing on it.



## Completed project:



## Operation:

I'm not going to try to replicate the thorough and somewhat humorous instructions provided by Geoff Trott, but only point out some things I've learned, and tell you about our first season's experience.

- As mentioned above, we found that with 2 people cruising, it was necessary to empty the liquids container about every 24 hours. Your mileage may vary. Remember to keep an eye on the gauge tube, as it is messy if you over-fill it.
- We did not need to empty the solids container. We spent about 25 full days aboard this season.
- There is no detectable smell in the head; none. Remarkable. Nor could we detect a smell on deck, even when sitting in the cockpit directly downwind of the vent. If you put your nose a few inches from the vent, you can detect a slight odor – more like garden mulch than poop.
- The fan supplied with the unit draws .06 amps, 24-7. That's about 10 amp hours per week – not too much to pull out of a 90 amp hour battery if you charge it each week. I will install a small solar panel that will keep the battery up indefinitely.
- Daysail guests seldom use a head for anything but pee, so there really are no special instructions to give them – except there is no need to flush. Explaining the process for solid waste is slightly more complicated and foreign, but no worse than the typical marine head.

## The rest of the story:

You will notice that I installed a direct drain from the sink – I did this years ago. Many of you have already done this, but if you haven't, you will need to, as it will no longer be an option to drain the sink into the head, as done originally. Because the sink can be below waterline when on a starboard tack, I put a one-way valve in the drain line.

You'll also notice that I haven't mentioned plugging the thruhull for the head raw water intake. I didn't – I installed a washdown pump supplied by the hose that formerly supplied the head. I put the pump under the sink in the head, figuring that if there were leaks they would drain into the shower sump. I had a good electrical supply here that formerly supplied the Lectrasan. I ran the output hose up to the forepeak, and used a through deck hose fitting. The pump is operated by a timer switch (in addition to its built-in pressure switch) – this is a safety feature; in case the output hose pops off I don't want it to fill the boat!

