

Installation of the Air Head™ on the Flicka

by Ellen and David Dawson

Nina is our fourth sailboat. All of them came with factory-installed traditional marine heads. And all of them stank.

It's discouraging to open the companionway hatch and smell the pent-up odors of waste from the boat's sanitation system. Eating supper and trying to fall asleep are unpleasant with the odors wafting through the cabin.



The Air Head,™ installed on *Nina*

In our last two boats, we addressed the problem by overhauling the existing systems.

In our second boat, we removed the old holding tank, built a new one out of marine plywood and fiberglass, ran all new top-quality marine sanitation hose, installed a new head, and followed a strict regimen of eco-friendly holding tank bio-enzyme additives. This worked fine, but was costly and labor-intensive.

In our third boat, we replaced the old hoses with the best possible marine sanitation hose, installed a new head, and made sure to rinse the large holding tank thoroughly after every pumpout.

WHY WE WANTED SOMETHING DIFFERENT ON *NINA*

Nina was different from our earlier sailboats in two respects: first, she had a macerator; and second, her holding tank was small.

Even though her holding tank was empty and had been rinsed, a faint but annoying odor permeated her cabin. We considered using our tried-and-true methods of preventing odor, but those two differences in *Nina's* system made us re-evaluate our strategy.

ABOUT THE AUTHORS:

Ellen and David Dawson own the 20-foot Flicka *Nina*, hull number 424, made by Pacific Seacraft in 1994. They have no financial interest in the Air Head company.

MORE INFORMATION:

<http://www.airheadtoilet.com>



Clean and odor-free.

I've never encountered a macerator that didn't stink. I have had them uninstalled and cleaned vigorously, and still they exude a nasty waste smell. I had my doubts that we could eliminate the odor from the system, no matter what we did, if the macerator remained.

Then there was the issue of the size of the holding tank. Even in our third sailboat, which had a 30-gallon holding tank, we found ourselves planning excursions around the locations of pumpout stations. On a trip down Chesapeake Bay from our home port north of the Bay Bridge down to Norfolk, we sketched out

a route that had us visiting marinas every third or fourth day, for the sole purpose of pumping out our holding tank. It was irritating, to say the least, to be forced to include an unnecessary leg criss-crossing the Bay just for this reason, rather than choosing destinations for more pleasant reasons.

With *Nina's* small holding tank, we felt that we would be severely constrained in our trip planning. This would force us to visit marinas instead of anchoring out — which we prefer — and waste our cruising kitty on slip fees when we would not otherwise choose to.

THE AIR HEAD OPTION

I don't remember where we had first heard of the Air Head™ composting toilet, but we took a serious look at it when we began to research alternatives to the traditional marine sanitation system.

We could have replaced the factory-installed system with a porta-potty. But *Nina* came with the enclosed head layout, so the option of a permanent installation appealed to us.

BENEFITS OF THE AIR HEAD

It produces no offensive odors.

If you follow the manufacturer's simple routines, there will be no odors other than a mild, "earthy" smell when the gate to the composting compartment is opened.

It requires no waste hoses or holding tank.

All of the waste is contained in the unit itself: solid matter in the composting compartment, and urine in a removable vessel attached to the front of the unit.

The “porta” part of the head is convenient.

The urine vessel is small and much lighter than a conventional porta-potty, so it's easy to carry to a shoreside bathroom for emptying.

Because you are only emptying urine, it is not subject to the “no porta-potty dumping” objections of many marinas; it's just urine that flushes right down the toilet, not a sludgy mess that will tax the septic systems of marinas.

It avoids pumpouts altogether.

Because there is no holding tank, you never need to visit a pumpout station again.

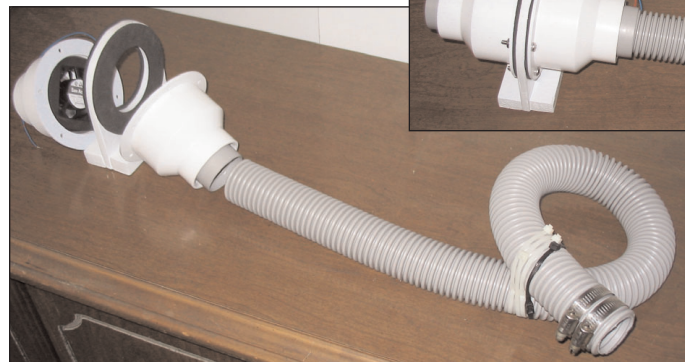
You can use it for a long time before you need to empty the solid waste container.

The composting part of the toilet holds a surprising amount of material; you can go for many weeks, even as much as a full season, without needing to remove the container for emptying.

Supplies for it are not expensive and are readily available.

You need coir, or peat moss, and ordinary composting enzyme to make the system work; these are easily obtainable online and from nurseries, and are not costly; and you don't use very much of either in a season.

You have the option of using what the Air Head company calls a “paper bowl liner”; this is really a “Mister Coffee” round-type coffeemaker filter, available and cheap.

***It's an eco-friendly system.***

The composted solid waste can be put into your garden; just make sure you *don't* put it anywhere that edibles will be grown.

It frees up space in the boat.

By removing the holding tank, macerator, and all waste plumbing hoses, a lot of space is recovered for other uses.

It eliminates thru-hulls.

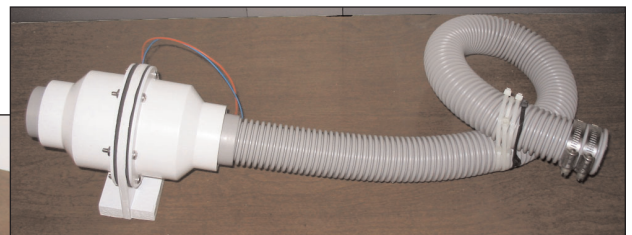
There are no overboard-discharge or raw water intake thru-hulls.

AIR HEAD INSTALLATION ISSUES

We had two concerns about the Air Head.

First, it called for a vent hose with fan to be installed in the system. Would we be able to fit this vent hose into the Flicka in a sensible manner? Would the fan draw the battery down unacceptably fast?

Second, would the Air Head fit where the original head had been installed without a lot of tweaking? Would it allow for sufficient headroom and elbow room? And would it be able to be removed, and a traditional system re-installed, if desired by a future owner?



The vent hose with 12v fan

After researching the Air Head, reading product reviews and testimonials, and talking by telephone to the owner of the Air Head company, we were able to satisfy ourselves on all of these issues.

OUR AIR HEAD INSTALLATION

We removed the macerator and its wiring, toilet, and all hoses from the boat. Then we capped off the overboard-discharge seacock, and capped the raw-water head intake, which tees off of the same thru-hull used for the engine raw water intake.



We've cleaned and stored the macerator and toilet in case they're needed for re-installation at a later date.

LOCATION OF THE VENT HOSE

Although we could have run a vent hose straight up from the Air Head, we thought that the cabin top was too cluttered for a nice installation. And we could have run it out the side of the cabintop but didn't want a vent sticking out onto the narrow side deck. A vent out to the hull was



The vent hose. Note the loop tucked up into the coaming (upper right).

unacceptable because of the certainty of water intrusion when heeled.

In the end, in consultation with the owner of the Air Head company, we determined that the best place to run the vent hose is straight back to the transom. The starboard cockpit locker is uncluttered, with enough room to run the vent hose along the upper outboard surface. It is necessary to put a loop in the line, and the gap provided by the coaming provides just enough room to accommodate the loop.

VENT HOSE INSTALLATION

The vent hose exits from a hole on the back of the Air Head, up over the lip of the wet locker behind the head (in order to avoid cutting a hole in the bulkhead).

From there it runs aft into the cockpit locker through one of the holes left by removing the existing waste hose. There are still some other

The vent hose runs from the back of the Air Head over the lip of the wet locker, then across the top of the wet locker through an existing hole to the starboard cockpit locker.





The vent hose and fan wiring are supported by wire ties screwed into the hull. Note the plywood pad behind the fan.

holes in that bulkhead; we may install a cover over them later for cosmetic purposes, but they'll be left in place in case re-installation of a traditional system is desired in the future.

We supported the vent hose and fan wiring by intermittently running wire ties around it and screwing them into the hull.

FAN INSTALLATION

The fan must run continuously, but draws only .08 amps. We figured that we can be away from the boat for two or three weeks without worrying about excessive battery discharge from the fan. Air Head does offer the option of a solar-powered vent, which may be a good choice if you plan to leave your boat for long periods of time between visits.

We mounted the fan on a plywood pad, which we mounted to the hull. We screwed the flanges for the fan to the pad, so the fan can easily be removed if it ever needs servicing or replacing.

We ran the fan's wiring, with an inline fuse, to the DC panel and connected it to the breaker

formerly used for the macerator. We leave this breaker on at all times. We make sure that the house battery, which the macerator breaker uses, remains on at all times. I plan to change this, hardwiring the fan directly to the battery so that I can turn off the house battery when we're off the boat — I don't want the batteries to be discharged by a something like a cabin light being left on accidentally.

VENT HOSE THRU-HULL

The vent exits the transom up near the backstay chainplate, immune to being pooped by all but the most extreme of waves. A clamshell vent cover over the transom thru-hull, together with the loop in the vent hose, should prevent water from getting into the system.



The vent emerges through the transom near the top. A marelon thru-hull and clamshell vent cover complete the installation.

INSTALLING THE AIR HEAD

We cut a plywood base for the Air Head and bolted it to the existing toilet platform using the bolt holes that the original installation used. We bolted the Air Head to this plywood base. This way, we didn't need to drill any new holes or glass over any existing holes. Our installation can be removed and a standard toilet re-installed without any additional work.

The footprint of the Air Head is slightly larger than the original toilet — it protrudes further forward — and the Air Head itself is a little taller than standard marine toilets. But there is adequate sitting headroom. There is enough elbow room for one's left arm, but more could be gotten by shortening the crank handle for the composting container and moving the Air Head to starboard an inch or so.

The crank handle that comes with the Air Head — it mixes the solids within the composting compartment — comes near to hitting the sloping hullside on the starboard side of the Air Head. Although it fits fine and we use it as it came from the factory, it can be modified — either to give a little more knuckle-room for easier cranking, or to provide a bit more elbow room for the user.

SHIMMING THE URINE TANK

The urine tank fits under the the front edge of the Air Head. It's held in place by knobs on either side. The liquid enters through a rigid tube on the underside of the Air Head, which fits into a hole in the top of the urine tank. This tube is fitted with a spring and gasket so the two components — Air Head and urine tank — are compressed together.



The gauge on the urine tank tells you how full it is.

We discovered that the urine tank didn't compress up against the Air Head as tightly as we would have wished, so we cut a half-moon shape out of stiff 1/8" plastic and wedged it between the urine tank and plywood base. This has worked fine. Our plastic shim came from an old scrap of headliner material, but we could have used other materials — we also cut one out of a vinyl placemat, which would have worked, but we liked the more rigid headliner material better.

OUR OPINION OF THE AIR HEAD

We are now in our second year of using the Air Head. Based on this admittedly brief trial, we have got to say that we are more pleased with this arrangement than with any other we've had, and would plan to install it immediately on any boat we owned.

We sailed a lot last summer — weeks at a time — and never had to empty the composting tank of the Air Head. We started out with the recommended amount of coir and starter enzyme, and added water from a spray bottle when the mixture seemed too dry. During the season, we stirred the compost one or two cranks every time we used the head. It never smelled, not even a little, with this simple routine. Of course, the fan stayed on all the time.

The urine tank never smelled except when we removed it for emptying. The odor can be greatly minimized by following the manufacturer's recommendation of adding sugar to the tank before re-installing it after emptying. There's a cap that fits onto the opening while transporting the urine container to a shoreside bathroom for emptying. The urine tank weighs only about 12 pounds when full — about half the weight of a porta-potty. There's a gauge on the side that lets you know when you're reaching the "must-dump" level.

The composting tank was far from full by Thanksgiving, when we finally had the boat hauled for winter. At the end of the season, we stirred the compost one last time and let it

continue to compost during the winter. In the spring, we stirred the compost again and added it to our garden. It was rich and black, with a pleasant compost smell.

QUALITY OF LIFE ABOARD

I would love the Air Head if only because it has, once and for all, solved the problems of odor in the waste system. But it has improved the quality of life aboard *Nina* in other ways, too.

We removed the cover of the Flicka's original holding tank and cleaned the interior. This has given us quite a bit of additional volume in the wet locker behind the head. That, plus the absence of the macerator and waste hoses, has really opened up the space in that locker.

We don't need to worry about rebuilding a toilet and maintaining hoses, thru-hulls, macerator, and other system components. There are few moving parts on the Air Head — they're not likely to fail, and easy to repair or replace if they do. This thing ought to last for the life of the boat.

And finally, we have been liberated from the tyranny of the pumpout. Freedom, indeed!



The wet locker has been freed up to hold other things.