



[United States \(change\)](#) | [My Boats](#) | [Login](#) | [Register](#)

•  
[Gear Store](#)

•  
[Resources](#)

- [Boats Blog](#)
- [Boating Reviews & Features](#)
  - [Videos](#)
  - [Boat Surveys](#)
  - [Boat Transport](#)
  - [Newsletter](#)
  - [New to Boating](#)
  - [NADA Guides](#)
  - [Boats Specs](#)
  - [Boat Shows](#)
  - [Yacht Charters](#)

•  
[Insurance](#)

- [Boat Insurance](#)

•  
[Loans](#)

- [Boat Loans](#)
- [My Boat Loans](#)

•  
[Engines](#)

- [Outboards](#)
- [Inboards](#)
- [Jet engines](#)
- [Trolling motors](#)

•  
[Sell Boats](#)

- [Sell your boat](#)
- [Seller Resource Guide](#)
- [Customer Testimonials](#)
  - [My Boats](#)

•  
[Buy Boats](#)

- [New Boats](#)
- [Pre-Owned Boats](#)
- [Advanced Search](#)
- [Power Boats](#)

- [Sailboats](#)
- [Fishing Boats](#)
- [Watersports](#)
- [Dealer Locator](#)

•  
[Home](#)



BOAT SEARCH

**FIND IT!**

[Advanced Search](#)

AN EVINRUDE E-TEC NEVER NEEDS ITS OIL CHANGED.

**EVINRUDE**  
E-TEC

FIND OUT WHY. GET YOUR

## SEARCH FEATURES AND REVIEWS

➤ [View Boat Reviews & Articles](#)

➤ [View Features Archive](#)

📡 [Subscribe to Features Feed](#)

## FEATURES

### [What Makes a Good Battery Hold-Down for a Boat?](#)

Stainless hold-downs can work in the right installation, but non-conductive ...  
[\(more\)](#)



### [Monterey 234SS: A Runabout with Value Added](#)

In adding the 234SS to its Super Sport line, Monterey ...  
[\(more\)](#)



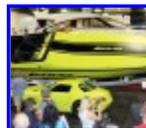
### [Metal Shark 28 Defiant Response Boat: Bite This!](#)

If you ever wondered what it was like to tear ...  
[\(more\)](#)



### [Electric Avenues: Inside the Cigarette-Mercedes AMG E-Drive Top Gun](#)

A close look at the most intriguing go-fast boat in ...  
[\(more\)](#)



## BOATS BLOG

IMAGE  
COMING  
SOON



### [Manic Monday Videos: Marlin 1, Fishermen 0](#)

March 25th 2013

If you ask us, this fish is the clear winner ...

[\(Read more...\)](#)

### [boats.com Drink Coozie Giveaway](#)

March 25th 2013

We're giving away boats.com drink coozies to our fans!

•

March 18th 2013.

By Charles Plueddeman



[1](#)

# Velodyne Martini 1.5: Active Suspension, on a Boat?

This is how Silicon Valley goes boating—on a pontoon boat with computer-controlled active suspension, that produces a perfectly smooth ride, courtesy of Velodyne.



The Velodyne Martini 1.5 was the wackiest, and most technically impressive, thing I saw at this year's Miami International Boat Show. In a nutshell, the Martini 1.5—so-named because it will keep your drink from sloshing—is a pontoon boat with active suspension.

The system is the creation of Velodyne founder [David Hall](#) and a team of very enthusiastic engineers, some of whom were at Miami and gave me a demo ride on the boat. Hall and the Velodyne name may be familiar to audiophiles, as he got his start in 1983 with a patented, accelerometer-based High Gain Servo System to control sub-woofer cone movement. The company, which is based on the fringe of Silicon Valley near Morgan Hill, California, is still in the speaker business and has also developed the Velodyne [LiDAR](#) system used for 3D mapping. At Miami, one of the engineers explained that the Martini 1.5 is based on the same premise as their original speaker, “but instead of measuring and reacting to the movement of the speaker cone, we are reacting to the movement of the boat deck to cancel out the action of the waves.” Here’s how it works.



The Velodyne Martini 1.5 at rest, with its suspension lowered. The boat pilot can manually adjust the suspension and the height of the boat deck.

The boat – a proof-of-concept prototype not intended to look nice – is about 35 feet long and floats on a pair of 30-foot plastic, foam-filled pontoons. Its beam is about 19 feet, and at Miami it was powered by a pair of 150-hp outboards mounted on the tail of each pontoon. The deck is supported by four articulated legs that look like the suspension arms of an off-road race truck blown up to three times scale. Each leg is controlled by a suspension unit that combines a rubber airbag of the type used on semi trucks over a screw actuator. The screw is controlled by a DC electric motor. The deck is just an aluminum platform with a pilothouse perched on top of the legs. Most of the suspension components are CNC-shaped aluminum. The design was created using a Solid Works CAD system and was subjected to finite element analysis to make sure it would not break up. Previous testing was conducted on San Francisco Bay.

A linear accelerometer that looks like the air valve on a car wheel is placed at each corner of the deck, and a gyroscope is placed below the deck. They work together to monitor the movement of the deck and feed that information to a computer, which reacts almost instantly and counters that movement by moving the suspension arms. If there’s a wave or wake, the pontoon hull moves up. If there’s a trough, it drops down. The front and rear arms on each pontoon move independently, so the hulls can sort of roll along over the water. The engineer on board, Andrew White, told me the system has five and a half feet of travel. The air bags are connected to an air compressor, and the computer inflates or

deflates the bags to provide the initial movement and to cushion the effect. The screw actuators provide more gross travel. So you don't spill your drink.



A view of the Martini 1.5 shows the front suspension legs and the airbag and actuator components.

I was not offered a cocktail before we shoved off from the Sea Isle Marina in Miami (it was early) but as soon as we passed out of the no-wake area the suspension system was doing its thing. We cut for the wake left by a passing excursion boat and I could look over the edge and see the pontoons moving to react. We proceeded out Government Cut to the edge of the ocean through perhaps a three-foot chop and the deck remained absolutely flat and steady, while the pontoons were in constant motion. In turns the suspension banks the deck a bit, which makes the ride even more comfortable. The only issue I noted on my ride was that the boat is very wet. The pontoons tend to send a swell of water right at the front suspension arms, which then shoot it up at the pilot house. That's why there's a pilot house. These pontoons are an off-the-shelf item, which the Velodyne engineers intend to replace with their own lighter, more hydrodynamic design. We were not able to get our video camera out on the Velodyne Martini 1.5, but you can see the system in action at the dock in our video.

So, you are asking, what is the practical application for this technology? Well, for starters how about providing a stable platform for filming 3D movies on the water? White told me that the day before the Miami show he hosted a team from Panasonic interested in using the boat, or one like it, to capture video of this summer's America's Cup sailing competition. Never before has there been a platform stable enough to shoot 3D on the water. I can also imagine it would support a dandy weapons platform for some military application, or make a great rescue boat. Or maybe it'll just become the ultimate rough-water, custom-built luxury pontoon boat for an owner with deep pockets, who does not want to spill his drink on a very busy Lake of the Ozarks afternoon. I wouldn't bet against it.

For information, visit [Velodyne](#).

-Charles Plueddeman

*Like to see 10 other strange, unusual, and truly unique boats? See the [Top 10 Coolest Looking Boats Ever](#).*



About the author:

## Charles Plueddeman

### Profile

Charles Plueddeman is Boats.com's outboard, trailer, and PWC expert. He is a former editor at Boating Magazine and contributor to many national publications since 1986.

[Read more](#)

This feature was posted on Monday, March 18th, 2013 at 6:00 am and is filed under [Boat Review/Test](#), [Multihull](#), [Pontoon boat](#), [Powerboat](#), [Video](#), [Video Boat Review Feature](#).

Tags: [active suspension](#), [Charles Plueddeman](#), [David Hall](#), [martini 1.5](#), [Miami Boat Show](#), [short take](#), [Velodyne](#)



0



9



3

[1](#)

### Leave a Reply

Name (required)

Mail (will not be published) (required)

Website



[Contact Us](#) | [Banner Advertising](#) | [Membership](#) | [Help](#) | [About Us](#) | [Sitemap](#) | [Glossary](#) | [Terms of Use](#)  
[Privacy](#)

Boats.com, Lake Union Building, Suite 320, 1700 Westlake Avenue North, Seattle, Washington  
98109. Facsimile 206.352.9406

© [Copyright](#) 2013 Dominion Enterprises. All rights reserved. Main site photos copyright © 2013 [Nei Rabinowitz](#).