

# Studying a Navy Relic, Undisturbed for Nearly 60 Years

By JOHN J. GEOGHEGAN III

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MOSS LANDING, Calif. — It was the largest aircraft ever built in the United States when it was launched by the Navy in 1933.



*National Oceanic and Atmospheric Administration and  
Monterey Bay Aquarium Research Institute*

*Researchers recently collected 44 hours of surveillance,  
including images of the crash site.*



*National Oceanic and Atmospheric Administration and  
Monterey Bay Aquarium Research Institute*

*An image of one of the four biplanes the craft was  
carrying.*



*National Oceanic and Atmospheric Administration and  
Monterey Bay Aquarium Research Institute*

*Images of fuel tanks from the U.S.S. Macon.*

Larger than three 747's parked nose to tail, almost four times as long as than Howard Hughes's Spruce Goose and just a few feet short of the Titanic, the U.S.S. Macon was the high-tech wonder of its day.

A rigid, lighter-than-air dirigible used by the Navy to extend the scouting range of its fleet, the Macon weighed over 200 tons and had an aluminum alloy skeleton underneath its canvas skin. It was kept aloft by 12 helium-filled gas cells, which, though not flammable and therefore safer than hydrogen, were also more costly and less efficient.

The Macon was also the last of its kind when it crashed off California's Big Sur coast in February 1935. Severe weather caused a massive structural failure in the Macon's tail section, shearing off its dorsal fin and puncturing two of its helium gas cells. Two members of its crew of 83 died in the crash.

The Macon struggled for almost an hour before it hit the ocean and sank in approximately 1,500 feet of water. It lay on the bottom undisturbed and undiscovered for nearly 60 years.

Several high-tech searches were launched during the 1980's to find the Macon, but it wasn't until June 1990 that it was located, by Chris Grech, deputy director of marine operations for the Monterey Bay Aquarium Research Institute, working with the Navy.

Earlier this month, Mr. Grech, co-principal investigator for the expedition, and a group of scientists including two biologists, a maritime historian, a marine archaeologist and the director of the Aerospace Robotics Lab at Stanford University, returned to the Macon's wreck site as part of a five-day research expedition.

The aquarium institute, the National Oceanic and Atmospheric Administration and Stanford were among the institutions working together on the project. One goal was to survey the Macon's debris fields using new, high-definition cameras and to assemble a photo mosaic of the site. Another was to inventory and categorize the wreck's deterioration and to gather the documentation necessary to have the Macon entered into the National Register of Historic Places.

Finally, many expedition members were quietly hoping to discover the Macon's missing tail section, to better understand the factors behind the crash.

The expedition spent five days off the coast of Big Sur using a remotely operated, deep-sea rover to accumulate 44 hours of surveillance of the wreck site.

The Macon broke up on the surface as it sank. As a result, the ocean bottom looks like a giant erector set after a child's tantrum. Perhaps the best preserved artifacts are the Macon's four Curtiss F9C-2 Sparrowhawk aircraft that were housed in its belly. All four planes sit upright looking undisturbed on the ocean floor, and two are almost nose to nose.

"The planes don't look damaged," said Mr. Grech, in large part because each biplane's wings are intact and their bright yellow color and blue and white Navy star are visible.

In addition to the planes, five of the Macon's giant Maybach engines can be clearly seen, as can part of its galley and stove, its officer quarters and an aluminum chair. A metal cabinet, a table, and a set of drawers are also clearly visible, as well as numerous fuel tanks, which were thrown overboard to lighten the ship and imploded as they sank.

Nevertheless, Mr. Grech has noticed differences in the site since his last visit.

“A lot of the wreck is covered up,” Mr. Grech said. “It’s easy for sediment to build up over time, and some large objects have moved.”

Records show that the Macon crashed three miles from the Point Sur lighthouse, but the exact location has been kept secret to protect the site, which lies within a marine sanctuary, from relic collectors.

It is too deep for scuba diving, but the site can be easily reached by a submersible or drag nets.

The Macon is also a Navy gravesite, so the expedition was careful not to disturb any artifacts.

Though the bodies of the two crewmen were never recovered, Bruce Terrell, a marine historian at the oceanic agency and a co-principal investigator on the expedition, was careful to note that the researchers “had not seen any indication of human remains.”

The Macon crash was later determined by a Naval Court of Inquiry to be the result of inadequate repairs to its air frame after a previous structural failure over Texas. The total loss of the ship, combined with the high cost of the program (the Macon was also the most expensive aircraft ever built at the time), put an end to the Navy’s 20-year rigid airship program.

Mr. Grech estimates that only two-thirds of the wreck has been found. The Macon’s tail section, which was the first section of the great ship to sink, is still missing.

“It’s either buried under sediment or in one of the canyons,” Mr. Grech speculated. And it’s likely he will be back to search for it.

**Correction: Oct. 6, 2006**

*A picture in Science Times on Tuesday with an article about a scientific expedition to the crash site of the Macon, a Navy dirigible that went down in 1935 off the coast of Big Sur, Calif., was published in error, based on information from a research institute. It showed the Akron, another Navy dirigible, not the Macon.*

Correction: March 15, 2007

An article in Science Times on Oct. 3 about an expedition to survey the debris field of the U.S.S. Macon, a Navy dirigible that crashed over the Pacific Ocean in 1935, referred imprecisely to the end of the Navy’s lighter-than-air program. While the crash of the Macon put an end to the use of *rigid* airships, the Navy continued to use blimps and semirigid airships; the last flight in the lighter-than-air program was in 1962. This correction was delayed because a reader’s e-mail message was not forwarded to the appropriate editors.