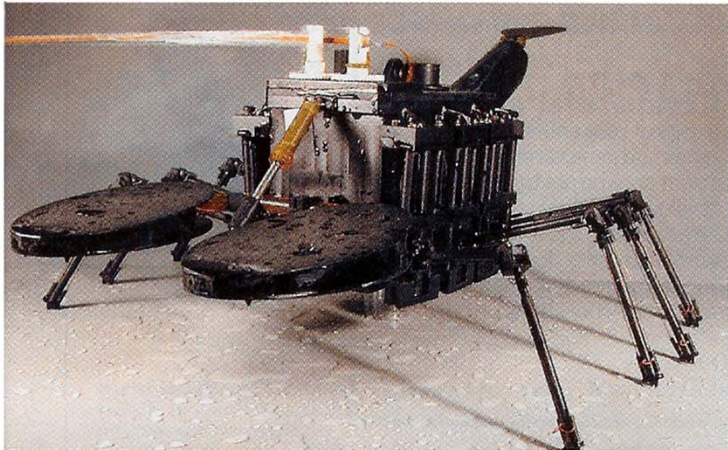


# The Unique Capabilities of Massa Have Been Recognized On Two Different Occasions by *TIME* Magazine



## MINE SWEEPER

No, it's not a pet you take to the beach. Robo-Lobster, a 7-lb., 2-ft.-long crustacean made of industrial-strength plastic, has a bigger job to do: detecting and destroying mines buried in the surf zone. At least, that's how the U.S. Navy plans to use the robot once developers at Massa Products deliver their final version next year. The current prototype mimics a real lobster's movements to negotiate all types of coastal terrain. The plastic antennas sense obstacles; the eight legs can propel it in any direction; the two claws and tail keep it stable in turbulent water.

**INVENTOR** Don Massa and Joseph Ayers

**AVAILABILITY** Late 2004 (military use only)

**TO LEARN MORE** [massa.com](http://massa.com)

TIME, NOVEMBER 17, 2003

## TIME Designated the Biomimetic Lobster Robot Developed by Massa as One of the "Coolest Inventions of 2003"



### SCIENCE

#### New A.S.W.

No sooner had the first U.S. nuclear submarines been launched than U.S. naval technicians turned toward the future with growing fear. Some day the Russians would have "nukes" too, and the new ships were so fast under water that they easily eluded the best World War II detection and kill systems, developed to deal with conventional subs. Dangerous defense problems seemed inevitable.

Now the first crude nukes are believed to be joining the Soviet fleet, but the long-dreaded day of reckoning is still somewhere in the future. During the last decade, A.S.W. (antiautonomous warfare) has taken giant strides. Killing systems no longer rely on short-range, slow-acting depth charges. Today the standard sub killer is the torpedo, lugged to the vicinity of its prey by an airplane, helicopter, rocket or another submarine. Once in the water it does not need to be aimed; it "homes" on its victim, following its evasive twisting far into the depths.

**Ocean of Sound.** The most ambitious A.S.W. project now under consideration is Artemis, an extremely powerful sonar system that may—so its tests indicate—fill a whole ocean with searching sound and spot anything sizable that is moving in the water. Artemis grew out of a 1951 suggestion by Harvard Physicist Frederick V. Hunt, who convinced Navy A.S.W. experts that submarines could be detected at great distances only by unheard-of volumes of low-pitched sound. Hunt's suggestion touched off theoretical research that looked better and better as it progressed. In 1959 Columbia University's Hudson Laboratories took over the development of Artemis and called on Frank Massa, president of the Massa Division of Cohu Electronics Inc. to build the necessary gigantic gadget for creating sound. No such underwater transducer (noisemaker) had been built before, but the very first units were successful. The largest Massa transducer is now installed in the converted Navy tanker, *Mission Capistrano*. It is so huge that when it is retracted, part of its 50-ft. length shows above the deck. When in use, it is lowered into the depths, where it manufactures sound from enough electric current to supply a city of 50,000 people.

The big transducer is now being actively tested at sea, and some of the listening it being done at a tower built on a submerged volcano south of Bermuda. Eventually, an entire Artemis system may form a sort of underwater DEW line to warn the U.S. of hostile submarines. Giant, unattended transducers, powered by cables from land, will be lowered to considerable depths where sound travels best. They will fill large parts of the ocean with carefully coded sound, and many hydrophones will listen for faint echoes from suspicious moving objects. No human ear or brain could make sense of the cacophony that the hydrophones will draw from the noise-filled sea, so the signals will be sent to giant computers on shore. After brief moments of electronic thought, the computers will decree: "This is a whale. This is the Queen Mary. And this is a fleet of submarines headed toward Nantucket."

**Low-Toned Sonar.** Biggest change of all is in the business of sub detection. The search for hidden subs still depends largely on sonar (underwater sound waves), but there has been an important switch: low-power, high-frequency sound has been replaced by low-frequency waves of enormous power. Sound with the pitch of low piano notes travels much farther than the high-pitched beeps of early sonar. But generating enough such noise under water is a large problem. The Navy's latest shipboard sonar weighs 30 tons and consumes 1,600 times as much power as the standard postwar sonar. The listening apparatus is trickier because the long, slow waves that echo from targets require computers to interpret them correctly. But the detection problem is considered licked, since the new equipment has many times the range of earlier sonars—enough for catching nukes under most combat conditions.

In 1959 Columbia University's Hudson Laboratories took over the development of Artemis and called on Frank Massa, president of the Massa Division of Cohu Electronics Inc. to build the necessary gigantic gadget for creating sound. No such underwater transducer (noisemaker) had been built before, but the very first units were successful. The largest Massa transducer is now installed in the converted Navy tanker, *Mission Capistrano*. It is so huge that when it is retracted, part of its 50-ft. length shows above the deck. When in use, it is lowered into the depths, where it manufactures sound from enough electric current to supply a city of 50,000 people.

## TIME Wrote About Massa Developing the World's Largest and Most Powerful Sonar Transducer In Its June 30, 1961 Edition