



[« back](#)

Microwave Beam Stops Cars Dead

Tracy Staedter, Discovery News

Nov. 29, 2007 -- The same microwave radiation that reheats pizza can be used to fry the electrical systems in cars, stopping them dead in their tracks.

Emitted from a rooftop device, the radiation could be used by law enforcement officers to put an end to dangerous car chases or by [military personnel](#) as a non-lethal way of disabling vehicles that get too close for comfort.

"The idea is to warn an automobile some distance away from a high-value target like a military barrack or a communication center. If they don't comply, you just zap them and it prevents them from coming closer," said James Tatoian, CEO of [Eureka Aerospace](#) in Pasadena, Calif.

Tatoian and his team have been working on the device since 2003. The current prototype is about 5 feet long, 3 feet wide, a foot thick, and weighs just under 200 pounds.

The technology uses the same kind of energy used in microwave ovens, but at a different frequency. Ovens typically operate at 2.45 Ghz, whereas the high-power car-stopping system is at 300 megahertz. In both cases, the radiation is above common [radio frequencies](#) and is not harmful to humans.

"There are no biological effects," said Tatoian. "We comply with every standard in the literature as far as biological impact."

To disable cars, the device first generates energy that is amplified using a generator. The energy is converted to microwave radiation and then directed, by way of a specially designed antenna, at the offender in a narrow beam.

The higher the frequency of the radiation, the more directed the beam, which allows the user to aim the energy at vulnerable car parts, such as light bulb filaments, lug nuts, frame bolts, or windshield antenna.

Having access to these locations is crucial because newer cars are made with lots of plastic parts, have rustproof paint that prevents electricity from conducting, and have computers already designed to withstand the electromagnetic energy coming from the car engine.

One beam pulsed in a burst lasting just 50 nanoseconds is enough to disrupt a vehicle's electrical system. The radiation can overload wires or damage or upset the car's central microprocessor.

In tests on four vehicles, the researchers were able to disable cars from 10 to 50 feet away.

Such a device could go a long way to save time and lives in places like southern California, where highways stretch uninterrupted for long distances and car chases are common.

"Once they get off the streets, they just go until they run out of gas," said commander Charles "Sid" Heal of the Los Angeles Sheriff's Department in Monterey Park, Calif. The department donated test cars for the experiments.

A technology that would shut down a car's computer could not only reduce the number of car chases, but could also allow police officers to intentionally stop a car in a location where the offender might have difficulty running from on foot.

Heal said he would like to see the researchers add a light to beam, so that law enforcers could see where they are directing the beam and offenders would realize that they are on the receiving end of some kind of weapon.

"We can put the visible light on them, and if we don't get compliance, we'll hit them with a device that kills the car," said Heal.

Tatoian thinks that with the proper funding, Eureka Aerospace can shrink the device in less than two years to a 50-pound appliance that looks like a plasma television and can disable cars from 600 feet away.

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