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RAPTOR: the quiet jackhammer

While jackhammers are necessary to maintain the world's infrastructure, is there any way to harness a jackhammer's concrete smashing power without all the noise? Yes, now there is. The U. S. Department of Energy's Brookhaven National Laboratory and the Gas Technology Institute (GTI) of Chicago along with other contributors, Keyspan Energy Company and Consolidated Edison Company of New York, have developed a replacement for the jackhammer that is not only quieter, but also safer, and more efficient and environmentally friendly. It is called **RAPTOR**, which stands for Rapid Cutter of Concrete. This device fires nails at velocities greater than the speed of sound and of sufficient speed to crack concrete.



RAPTOR III in its third phase of experimentation.

This revolutionary technology uses a Brookhaven designed, two-stage, helium driven gas gun that accelerates inexpensive lightweight steel projectiles at four to five times the speed of sound.

RAPTOR is equipped with a silencer and emits only intermittent noise levels that are quieter than a conventional jackhammer, which is both steady and loud.



Sample of RAPTOR's ability to break concrete.

In its third phase of experimentation, **RAPTOR III** is designed to break up to six-inch thick pavement efficiently and effectively. **RAPTOR III** is a shorter version of its predecessor, **RAPTOR II**, and is supported by a recoil-absorbing stand for easy handling. It also is equipped with an automatic loader which loads nail projectiles remotely. In a recent testing, **RAPTOR III** fired nail projectiles successfully onto a concrete slab simulating a field condition. Seven nails fired on a line across the center of the 30"x30"x4" were sufficient to crack the concrete block clearly across the entire length.

As **RAPTOR** is being moved toward the marketplace, Brookhaven's researchers are already thinking of other applications of this technological breakthrough.

RAPTOR is just one example of how the Department of Energy and BNL work with industry to apply laboratory science and technology to solve everyday problems.

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*RAPTOR III auto loader
(designed and built by
Engineering Services, Inc
Toronto, Canada).*