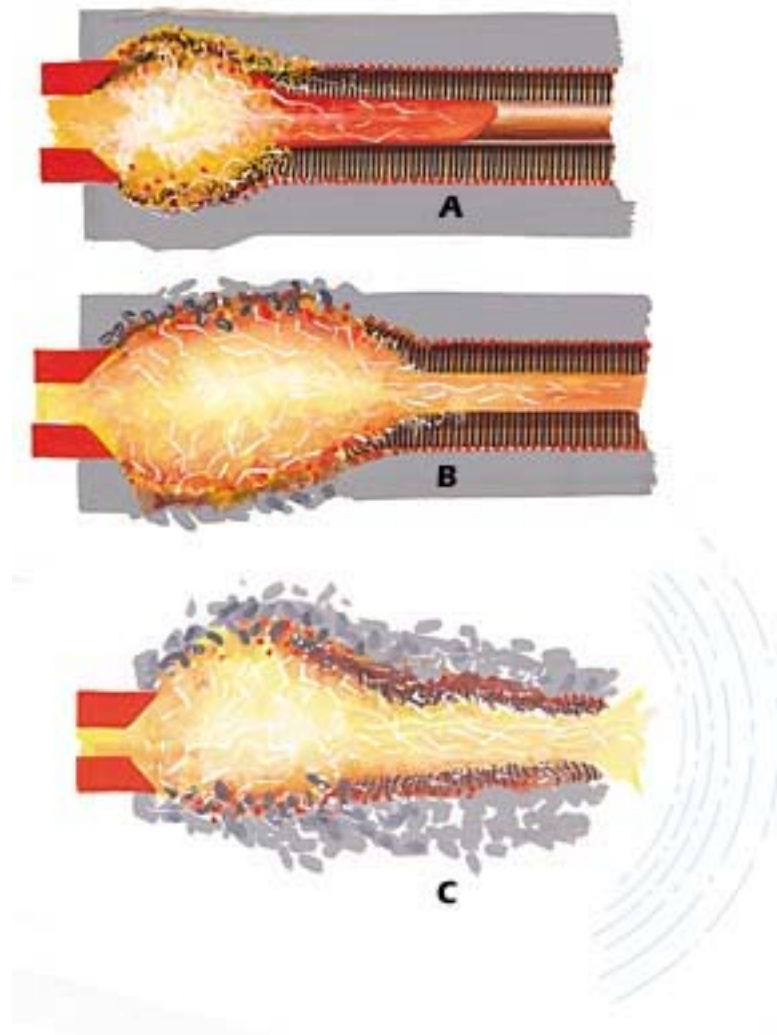


A Poor Man's E-Bomb

An FCG is an astoundingly simple weapon. It consists of an explosives-packed tube placed inside a slightly larger copper coil, as shown below. The instant before the chemical explosive is detonated, the coil is energized by a bank of capacitors, creating a magnetic field. The explosive charge detonates from the rear forward. As the tube flares outward it touches the edge of the coil, thereby creating a moving short circuit. "The propagating short has the effect of compressing the magnetic field while reducing the inductance of the stator [coil]," says Kopp. "The result is that FCGs will produce a ramping current pulse, which breaks before the final disintegration of the device. Published results suggest ramp times of tens of hundreds of microseconds and peak currents of tens of millions of amps." The pulse that emerges makes a lightning bolt seem like a flashbulb by comparison. An Air Force spokesman, who describes this effect as similar to a lightning strike, points out that electronics systems can be protected by placing them in metal enclosures called Faraday Cages that divert any impinging electromagnetic energy directly to the ground. Foreign military analysts say this reassuring explanation is incomplete. The India Connection

The Indian military has studied FCG devices in detail because it fears that Pakistan, with which it has ongoing conflicts, might use E-bombs against the city of Bangalore, a sort of Indian Silicon Valley. An Indian Institute for Defense Studies and Analysis study of E-bombs points to two problems that have been largely overlooked by the West. The first is that very-high-frequency pulses, in the microwave range, can worm their way around vents in Faraday Cages. The second concern is known as the "late-time EMP effect," and may be the most worrisome aspect of FCG devices. It occurs in the 15 minutes after detonation. During this period, the EMP that surged through electrical systems creates localized magnetic fields. When these magnetic fields collapse, they cause electric surges to travel through the power and telecommunication infrastructure. This string-of-firecrackers effect means that terrorists would not have to drop their homemade E-bombs directly on the targets they wish to destroy. Heavily guarded sites, such as telephone switching centers and electronic funds-transfer exchanges, could be attacked through their electric and telecommunication connections. Knock out electric power, computers and telecommunication and you've destroyed the foundation of modern society. In the age of Third World-sponsored terrorism, the E-bomb is the great equalizer.



To ignite an E-bomb, a starter current energizes the stator coil, creating a magnetic field. The explosion (A) expands the tube, short-circuiting the coil and compressing the magnetic field forward (B). The pulse is emitted (C) at high frequencies that defeat protective devices like Faraday Cages.