

(Eraser) - EM-1 Railgun

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The **EM-1 Rail gun** (EM standing for "Electro Magnetic") is a weapon depicted in the film *Eraser*, used by assassins and most notably the lead character, Deputy U.S. Marshal John Kruger (Arnold Schwarzenegger). Though the 'rail gun' is a real life weapon concept dating back almost a century and various working examples of weapon-grade railguns have been tested by the U.S. Navy, the one depicted in the film is fictional. Available information seems to indicate the weapons were all non-firing props; a couple of highly detailed machined versions were built for closeups, with less detailed ones for medium shots and some throw-away props for distant and fast shots. The weapon's actual design seems to have been largely achieved by drawing a rectangle and adding on aftermarket assault rifle components.



High-detail EM-1 Railgun prop used in *Eraser*



Another EM-1 prop, this one with far less detail and no scope or stock.

The Physics of the EM-1 Rail Gun

In the movie, the EM-1 is said to fire aluminum rounds at close to the speed of light, which is dubious for all manner of reasons; power consumption and heating would both be impossible to deal with in an infantry weapon, but the main issue would be how a C-fractional bullet would interact with the air around it. The projectile would be superheated almost instantly and burn up before it left the barrel, with the gun effectively firing a stream of plasma that would rise and dissipate; the result would be more like a hot steam gun than a projectile weapon. If it didn't, the projectile would interact with the atmosphere like a large meteor, creating a massive superheated trail that behaved like a directional nuclear explosion, including wake radiation in the area behind it. Far from throwing victims into the air, it would drill a hole through them so cleanly and quickly they'd barely notice in the instant before they and the entire surrounding area were obliterated by the wake. The shooter would likely end up with an EM-1 shaped hole in them and an equally large trail of destruction going in the opposite direction from the gun shooting itself backwards with similar velocity to the projectile.

The "X-Ray" Scope of the weapon

One of the most intimidating features of the weapon is its optical tracking system. The EM-1 is fitted with a variable magnification "X-Ray" scope, allowing the user to see through solid walls and showing human targets as skeletons, with the user able to mark his shot to their visible beating heart. The scope is a Hollywood invention; any X-Ray that could pass through steel, brick or concrete would not reflect off soft tissue or bone and pass through denser material *again* to get back to the detector, it would simply go through the less dense material and carry on. Real X-Ray machines work by firing X-Rays from an emitter on one side at a plate on the other, with bones and other dense structures showing up because they do not allow the rays to pass through; the traditional X-Ray with white bones is a

negative, showing where the rays did not pass through, not where they were reflected back at the emitter. The net result is that the scope wouldn't actually display *anything at all* unless the entire area was saturated with lethal radiation or an emitter were present on the opposite side of the target.

Influence of the EM-1 in Pop Culture

The depiction of the EM-1 inspired a number of "X-Ray Scopes" and railguns that could fire through walls in videogames, including the Farsight in *Perfect Dark*, the railguns in the first two *Red Faction* games and the Auger rifle in *Resistance: Fall of Man* and *Resistance 2*. The distinctive swirling circular trails left by the rounds as they travel in the movie were also copied, notably by the first *Turok* game's "Alien Weapon" device and *Quake 2*'s Railgun. The EM-1 also was one of pop culture weapons seen used in the film *Ready Player One*.

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