

Re: Making lightning with a thin wire

Source: <http://sci.tech--archive.net/Archive/sci.electronics.design/2006-12/msg04178.html>

- *From:* "Elektroniker" <Railtramp@xxxxxxx>
 - *Date:* 21 Dec 2006 19:34:30 -0800
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Winfield Hill wrote:

Ignoramus17570 wrote...

Another question, can such things be viewed with an autodarkening welding helmet. (1/20,000th of a second darkening time)

Be careful: 50us isn't fast enough.

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Thanks,
- Win

While in college, I worked in an on campus instrumentation lab. Our job was to build whatever it was that researchers needed. I was given the task of designing an safe fuse and detonator for an acetelyne/oxygen bomb developed by the US Bureau of Mines. It was called a CERB (Controlled Electronic Rock Blaster).

The fuse consisted of a piece of #30 wirewrap wire strung between two mounts. This was sealed into the gas mixture housing. The fuse was considered safe since only a huge amount of energy could cause ignition.

Ignition was accomplished by charging a large capacitor (5 uF) to 15 KV. This cap was the input to a triggered spark gap. The output was the #30 wire in the gas mixture chamber. The cap was charged, arming the circuit, and then the spark gap trigger by a thyatron, causing the cap to be discharged into essentially a short.

The discharge event lasted less than 5 usec, in which time, the wire would vaporize igniting the gas mixture. A combustion wave would propagate down the cylinder, and at 100K psi, a shear plate would release, sending a shock wave down toward the area to be "blasted".

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The theory was that the shock wave could be more controlled, better directed, and the blast would consume less energy than conventional explosives.

This was one of the best projects I ever got to work on. The first test was in a basement lab and we had no idea what the effect of that kind of force would be. The room was destroyed. The shear plate punched a hole in the concrete wall, all the lights were in shambles. Later, a steel plate was used as the target and even this ultimately had a hole abraded through it.

The first field test was also spectacular. The CERB was untethered, and when detonated, shot straight up in the air like the rocket it was with only the fuse and detonator wires to limit its flight.

Other labs were working on the approach as well. The highest energy data point could never be replicated because the researcher lost his lab in the experiment. Our work was directed by Thomas Blythe, whose brilliant career was shortened by some tough disease.

Blakely

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