Electricity used in Weapons

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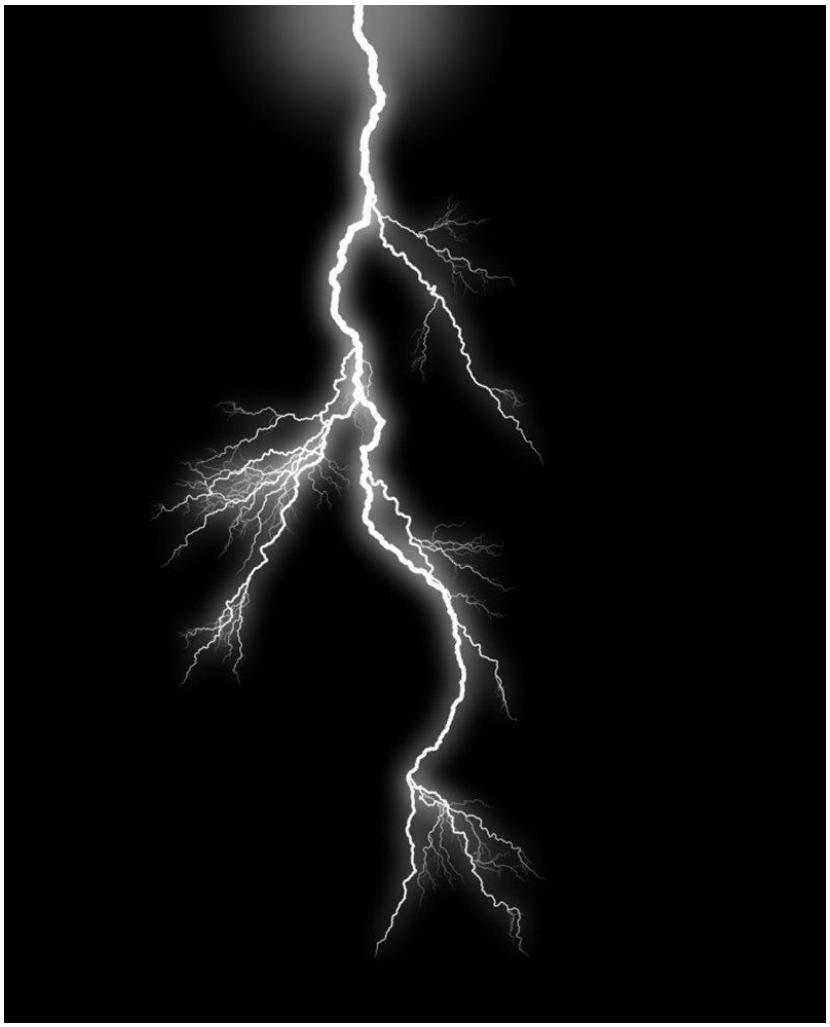
Physics H02
April 26, 2012

Electricity is a natural occurrence in humanity's everyday life, so much so that there are very few things that do not run off electricity. Electricity has greatly contributed to the expansion of society as a whole and the convenience of daily life. The use of electricity is not just limited to the use in everyday life; it is also being used in weapons. Electricity can be a very deadly existence to humans if used in a certain manner.

Lightning(Fig. 1. 2012) is one of the most destructive forces on earth, as it arches from



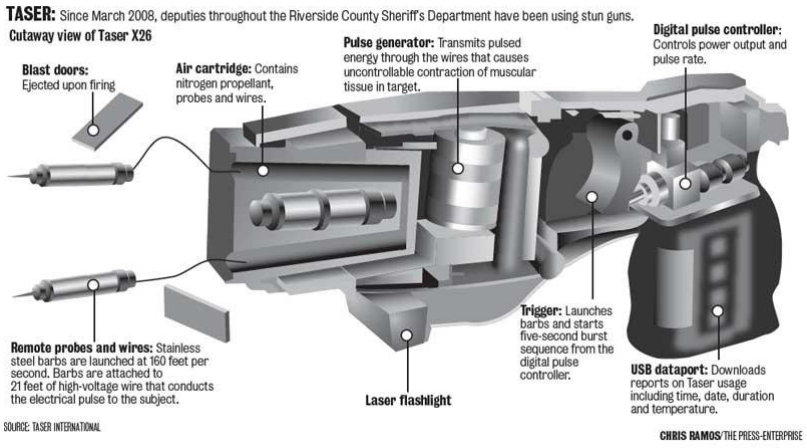
point to point, and is electricity at one of its most powerful points. That is just an outrageous example of how dangerous electricity can be, for the chance of being struck by lightning in a lifetime is one out of ten thousand (Cooper 2012). A more appropriate example is being shocked by a household outlet that carries one hundred twenty volts of electricity (Hyperphyscis 2012); it is very painful when shocked by a household outlet. The dangerous part of electricity is not from the actual volts of electricity, though high voltage can cause great damage to the body and kill, but the current, or amps, that the voltage is being carried. A household outlet may hurt, but there are

breakers that limit the amount of current of the set voltage in a house to protect people serious injury and death.

The amount of amps that causes harm to humans varies per person, not by much, depending on the resistance of the person skin and where the current enters the body. At only ten milliamps, .01 amps, it can cause great pain and shock and above that muscular contractions begin and it will become impossible to let go of the source of electricity. At only twenty milliamps it will become difficult to breath and at seventy-five milliamps it will cease all together. At one hundred milliamps, or .1 amps, death occurs for most and if they body was to experience two hundred milliamps and above severe burns would result (Giovinazzo 2012). To show how severe this is in actuality a light bulb takes five hundred milliamps, .5 amps, to run; five times the lethal amount of a human (Avenson 2012).

The use of electricity in a weapon is not so farfetched when it is that harmful to a human body. In truth, a weapon that uses electricity to stun an assailant has been on the rise in the police and for self-defense; the taser, not to be confused with a stun gun. There are many different models of tasers in circulation today (Stanford 2012). Though there basic structure is the same there are small differences; for example one is smaller than another or one can fire farther.

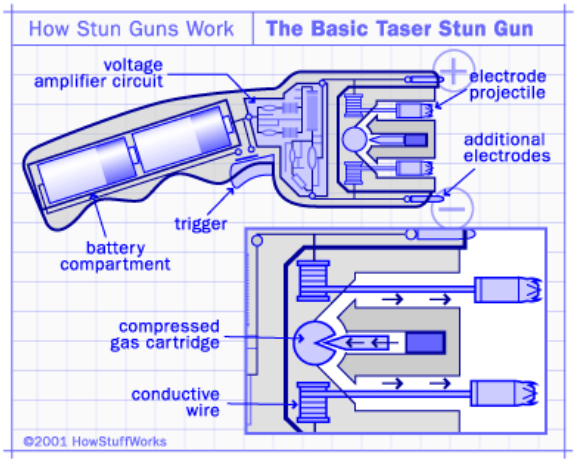
Fig. 2



A taser, of any model, contain two probes, each attached to copper wire that will remain connected to the weapon at all times, even after being fired. The probes, when fired, penetrate the skin and stick to the body because

of their small body, which will only cause minor wounds after their removal. The probes are able to reach a distance of twenty-one feet after being fired from the cartridge, which contains compressed nitrogen for the firing of the probes, when the trigger is pulled. The probes release a fifty thousand volt shock with a few milliamps into the target upon impact for five seconds; unless the operator's finger remains on the trigger then it is indefinitely long. The shock can be repeated countless times as long as both probes are still connected to the target and the copper wire has not been cut off from the power source or probes (Stanford 2012). The reason that both probes must be present in the target to remain effective is because the probes create an electric circuit between each other, one releases the voltage into the target while the other takes it out (Engber 2012). It is also possible to introduce the shock at close range, point blank; there are similarities between a stun gun and taser, only when the taser is being used at point blank range.

A stun gun is a self-defense weapon that uses electricity to stop an attacker, the method it uses electricity is similar to that of a taser beside the point stun guns are for close range use only. The stun gun has two metal prongs that need to both be pressed against the target for the electricity to course through the target, just like how both probes need to be in the target for a taser. This can be seen in the picture to the left (Fig. 3 2012). When both prongs are touching the target and the wielder of the stun gun pulls the trigger a larger voltage, but low amperage to avoid serious injury, runs through the target's nervous system (TBO-Tech 2012).

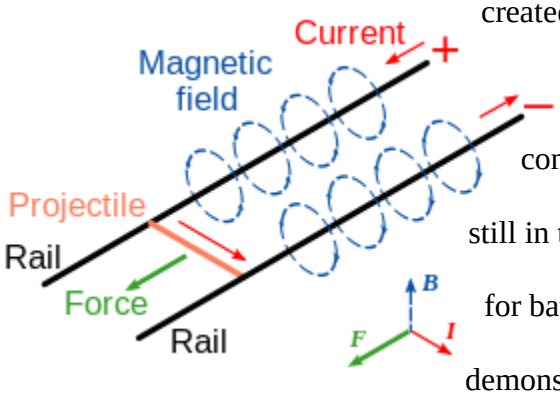


There are two possible outcomes when a stun gun is used on the target when used on the target. One is it forces muscles to do work rapidly and inefficiently through the high pulse

frequency that is designed to mimic the body's own electrical signals, the work doesn't make the target move it just depletes the energy, or stamina, of a the target. The second is the electricity combines with the body's electrical signals making it impossible for the target to move, becoming paralyzed for some time (Harris 2012). Due to the fact that every person is different the range of time that the stun gun needs to be pressed against the skin for one of the two results to happen varies from one second to five seconds, which is a great time in any struggle. That said, it is impossible for the wielder themselves to be harmed by the stun gun shock, if it is shocking the target, because the shock cannot travel between bodies; even when connected (TBO-Tech 2012).

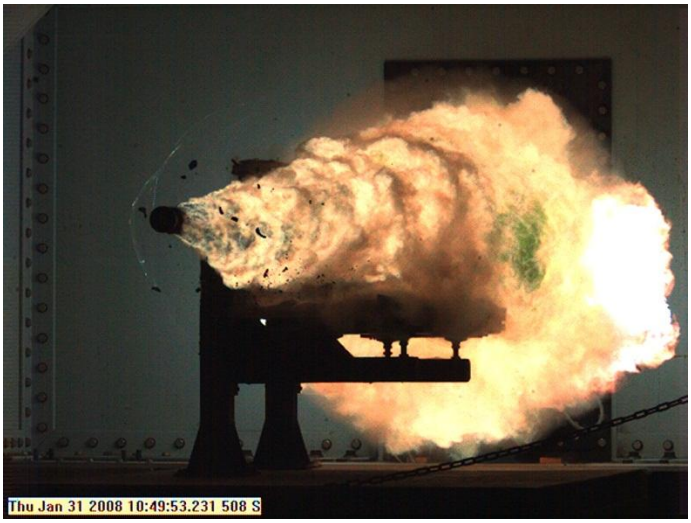
These two electrical weapons, taser and stun gun, are used for self-defense and apprehending criminals in a way to lessen injuries on both sides, but that isn't always the case. There are many risks on the target when electricity is used on them. Depending on the point of shock it is possible to cause impairment, if around the eye, or even a seizure if the head is the point of shock. That is not the worst of the risk that are involved with being shocked by a taser or stun gun. The worst possible scenario, which is most likely in "children, the elderly, people with with pre-existing cardiovascular problems, drug users, and individuals who take certain psychiatric medications (Standford 2012)," is when the shock occurs during the vulnerable period of the heart beat which ends in death. Also, the chance of death increases the longer the shock is, if shocked multiple times, or an increase in charge of the shock (Standford 2012). This is just electricity used in self-defense weapons, it is not meant to seriously harm or kill anyone, and from this is reasonable to conclude that a weapon made for destruction would be devastating towards the target.

Electricity has a certain property that can create a force, called Lorentz Force, that is caused by the magnetic field and current. The railgun is such a weapon that uses the force created from electricity to fire a projectile. This does not incorporate electricity as the weapon, but the sheer power of it is majorly contributed by the power caused from the electricity. Railguns are still in the testing stages of being fully incorporated into a weapon used for battle, but it is not a fictional work and has already been demonstrated for the Navy (Defensetech 2012).



Railguns are classified under electromagnetic weapons due to the fact that uses the Lorenz force to launch projectiles. The force is generate due to two parallel rails having current pass through them, a positive and negative, where the projectile is used to complete the circuit of the two rails (Alexander 2008); as seen in the picture above (Fig. 4 2012). The current, to generate a great amount of force to launch projectile, is in the millions of amps (Harris 2012).

The force generated by the electricity is so powerful that it can take a three kilogram, about six and half pounds, object and it would impact at five times the speed of sound, having equal power to a cruise missile warhead's detonation on impact (Alexander 2008). The picture to the right is of a test firing in January 2008 at the Naval Surface Warfare Center (Fig. 5 2008), the force was so powerful the projectile had a trail of plasma trailing behind it. To contain the power the launch length alone is one thousand six hundred meters in length, almost an entire



mile, and after the projectile leaves with thirty-five gigajoules in only point forty-three seconds (Wikipedia 2012).

There are still some problems with this devastating weapon. The power supply must contain a compositor big enough to create a large amount of current, which takes many cubic meters in size with today's technology. There is also the problem with the heat damage done to the rails when the projectile is fired at such high-velocity. Then one of the major is the repulsion force that the rails force onto one another, which due to the immense current is very significant.

Electricity is a powerful existence in today's society. The self-defense weapons that use electricity easily harm a person, and unfortunately despite careful planning of the design it can still be deadly. A weapon made using electricity to create a force to propel it through the air is a devastating existence that can make something that weighs very little cause as much destruction as a warhead. Electricity helps humanity grow at a significant rate, but it can still cause harm if used in certain ways.

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