

General Information on Electromagnetic Pulses (EMP)

An EMP pulse is generated by any type of electrical disturbance. This can be the result of a computer changing states, to a bolt of lightning, up to a nuclear detonation, and obviously any discharge energy in between those extremes. Now the effect of the EMP pulse on adjacent electronic equipment will be the result of several functions: the power of the pulse, the dynamics of the pulse being rise time and frequency ranges, and the sensitivity of the target to the particular EMP pulse will dictate the amount of interference or damage.

An example of a reasonably low level, low-power EMP pulse is the effect of the igniting of the spark plug on a lawn mower or other gas powered machines causing interference on a television set and the static ticking sound on a radio. This seldom occurs in today's world as preventive measures have been taken in the design of the equipment to eliminate this effect.

Lightning can be heard on the radio and is often called static crashes. An AM radio is particularly susceptible due to the method of modulation responding to signal amplitude, where FM radio modulation is a function of shifting frequency and is much less prone as is television. However, a "close by" bolt will cause an interference effect and possibly damage the equipment. This is why it is a good idea to disconnect sensitive computers completely from power lines and other leads and wires that could pick up the energy of the lightning pulse and cause problems.

Now a lightning strike is really not the "ideal" type of pulse to intentionally damage equipment, as the rise time is too slow, and any effect from the discharge is mainly due to the brute force large amount of energy contained within the lightning discharge. If the rise time of a lightning pulse was significantly faster, than all hell would break loose as there are about 8 million lightning strikes per day on our planet.

Man-made high-energy EMP pulses can take on many forms, from a nuclear detonation to a flux compression bomb to a specialized low inductance capacitor discharging a fast rise time current impulse through a fast acting switch into a radiating object such as a coil of wire. There are several methods of converting this energy into the proper pulse shape for highly effective applications. These are usually in the form of virtual cathode oscillators, vircators, gyrotrons, explosives compressing current seeded pulsed inductors known as flux compression generators, and other complicated methods.

The EMP generators on our website range from low-power, limited range devices that will demonstrate proof of concept, to higher-power generators that can be set up in a normal laboratory for testing certain strategic electronic components to the susceptibility of damage. Military and LEO testing will of course be interested in examining the effects on multiple targets, power line grids using flux compression devices, communications systems using virtual cathode oscillators, pulsed high-powered microwave and similar systems, ways to develop a practical disabling of speeding vehicles without collateral damage, etc. These studies usually require special laboratory equipment, funding, and classified expertise that is not available to the average person.

However small devices can be made to show proof of concept and to be used for short range disruption of sensitive electronic equipment for demonstration of damage susceptibility purposes only.

We suggest checking Wikipedia for more detailed data and consider sending them a small donation as there is no charge for this highly informative data.