

Re: Building Ground (long-...sorry)

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Described by jakdedert is a building all but begging for lightning damage. For example, a cow stands in an open field when lightning strikes a nearby tree. The cow is killed. Killed by electromagnetic fields? Of course not. Killed because cow was part of a path from cloud, through tree, into earth to earth borne charges maybe miles distant. The electrically shortest path was not under the cow. It was up cow's hind legs and down fore legs. Cow was part of a direct lightning strike from cloud to distant earthborne charges.

Cow could have lived is a halo ground surrounded the cow. That buried conductor would have, instead, routed electricity around (not through) cows. The concept is called single point earthing. Cow with separated legs has multiple earthing connections – therefore dead. Cow centered in a halo ground has a single point ground.

jakdedert describes here (and previously) utilities (ie mutli-line phones) entering and earthed more like the cow. Building is even worse because earthing points are farther apart. Destructive charge can enter building on telephone line (overhead or underground line) either from its grounding connection or via utility wire (from nearby struck tree, from other struck building, or entering via ground rod). That transient crossed building, destructively through appliances, to obtain earth via AC electric.

Connecting phone line with a 20' plus ground wire or via pipes accomplishes little. Wire has impedance. That means earthing from each incoming utility to a single point earth ground MUST be less than 10 feet. Other features such as no splices, no sharp bends, no solder joints (on wire or pipe), etc also required to lower impedance. Not resistance – impedance.

A minimal single point ground is a grounding rod. That means even incoming cable TV wire must make that 'less than 10 foot' earthing connection to earthing electrode. Better earthing is a halo ground (what saved the 'dead' cow) or even better, Ufer ground.

What does a protector do? A protector only connects from AC electric or phone lines (that cannot be earthed directly) to an earthing electrode. Protector is nothing more than an connection. No earth

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ground means an ineffective protector – which many overpriced, plug-in protector manufacturers hope you never learn. Plug-in protectors that have no earthing connection, then, connect to what? They hope youj never ask that question.

Cable TV does not need protectors which often degrade cable modem or TV signal. Cable is earthed directly – hardwired – to earth without any protector for superior protection. Wire does better than a protector.

An electric utility demonstrates bad, good, and ugly earthing. Ugly because the earthing electrode must be 'lengthened' so that all utilities make a common earthing point:

<http://www.cinergy.com/surge/ttip08.htm>

Water pipe typically is not good earthing. Pipes too long, too far away, too many sharp bends, solder joints, etc. A major difference between earthing for human safety verses earthing for transistor safety. A major difference between resistance and impedance means wire distance is more critical that a low resistance ground. Worse, jakdedert describes grounding to pipes or water faucets. That means ineffective and multi point earthing – that also killed the cow.

Most critical component in a lightning protection system is earthing. Earthing defines uality of that protection 'system' and effectiveness of protectors. Ineffective plug-in protectors avoid all mention of earthing to sell hyped products at higher profits. Such ineffective products have no dedicated earthing connection AND avoid earthing discussions to keep customers ignorant. Bottom line: a protector is only as effective as its earth ground.

Effective protector manufacturers have names such as GE, Polyphaser, Square D, Intermatic, Siemens, Cutler-Hammer, and Leviton. Their effective products have that dedicated earthing wire. Notice that names such as APC, Tripplite, Belkin, and Monster are specifically not mentioned. The telephone company already installs an effective 'whole house' protector in their NID (premise interface) box. But again, you (the owner) define its effectiveness by providing an earthing system.

UK residents who suffer so few lightning storms also suffer frequent and unnecessary damage. This because UK incoming phone lines don't have that necessary earthing. BT does install effective earthed protectors on their end. But subscribers are expected to pay for their own protection – which is provided free in North America.

Also is a myth that underground wires are better protected. Does not matter as demonstated by the 'dead' cow. Any utility that does not first connect to single point ground before entering a building is an obvious incoming path for household electronics damage. As the 'dead' cow demonstrates, single point earthing means even a nearby lightning strike can be a direct strike into building electronics – if

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building's earthing is not properly installed and connected to by every incoming utility wire.

Damage could have been from voltage potential between different buildings OR from buried wire carrying transient from a nearby struck tree. Multiple sources of damage – all due to a building owner who did not install the most critical component in a protection 'system': single point earth ground. Why does a telco Central Office, connected to every other building in town by copper wires, not suffer damage? The solution has been standard for so many generations – proven multiple generations before transistors were created. Protection is and is defined by earthing. Even protectors are only as effective as their earthing.

Travis Jordan wrote:

Michael Kennedy wrote:

I found out the hard way that burrying the wire doesn't help with lightning protection when I ran a cat5 ethernet wire from my house to a friends last year. That thing got zapped evey time we had a bad storm..

The problem wasn't caused by the ethernet wiring; it was the difference in ground potential between the two homes.

You should have optically isolated the two ends to avoid the problem.