

Re: Lightning and computer?

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- *From:* w_tom <w_tom1@xxxxxxxxxxxx>
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Most people never learned principles of protection. Their knowledge comes from 'half truths' promoted on retail store shelves. This post will be long because it is introducing fundamental concepts of protection rarely discussed by those who 'just know – facts be damned'. It will directly confront those popular urban myths. It will be long because myths are numerous and aggressively promoted. Questions and doubts will often be answered using third party and industry sources. This only introduces a technology well proven by the 1930s and that operates without failure in virtually every town. Well proven where failure is not an option. Protection that costs so much less than overhyped plug-in protectors and UPSes.

Ham radio operators would disconnect the antenna and suffer damage. They would disconnect the antenna, put the lead inside a mason jar, and still suffer damage. Then they connected the antenna to an earth ground. Not just any ground. Earth ground. No more damage. Disconnection is not an effective solution.

Ben Franklin demonstrated same in 1752. Diverting so that lightning did not find earth ground via a church steeple. One does not stop, block, or absorb lightning. Only mythical plug-in protectors claim to do that. A tiny protector is going to stop what 3 miles of sky could not? Effective protection earths. Diverts before a transient can even enter the building. Diverting to earth has always been the well proven and effective protection – be it a lightning rod or protection on every incoming utility wire.

Your phone company shuts down when storms approach. Obviously they must disconnect to protect a \$multi-million computer that connects to overhead wires everywhere in town. Oh? They don't shut down? And they don't use plug-in protectors? Solution: every line is earthed before it gets near to that computer. Earthing is best accomplished 50 meters (150 feet) before that wire gets to transistors. This

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being a far less expensive and well proven solution. A technology defined in 1930s research papers. And yet even here, notice the numerous posters who fail to address what has long been effective protection.

Ignore those who promoted names like APC, Tripplite, Panamax, Belkin, or Monster Cable. They know not how science works. They promote junk science. Responsible products have names like Square D, Furse, Leviton, Erico, Intermatic, Cutler Hammer, Polyphaser, GE, and Siemens. What do effective protector do? Same as Franklin did in 1752. Earth that incoming transient before it can enter a building.

Would you spend \$15 or \$50 on every electronic appliance? Then you have money to burn. Effective 'whole house' protector costs on the order of \$1 per protected appliance AND remains fully functional after each transient. For residential protection, responsible stores such as Home Depot (Intermatic IG1240RC) and Lowes (Cutler Hammer and GE) sell effective 'whole house' protectors. Phone line has long contained such protectors inside the NID. Why? Its so inexpensive and so effective.

But again, the lessons demonstrated by Franklin, ham radio operators, and the telco switching computer. They earth each incoming utility wire before a transient enters a building. Do 911 Operators remove headsets when thunderstorms arrive? Again, effective protection so long proven: earthing. Earthing means a no destructive transient in the headset (upon the head) of that 911 operator.

Posted previously were myths that a magic box (UPS or power strip: both contain the same protector circuit) would protect electronics. One was so technically ignorant as to claim the UPS will "filter" phone lines. Even the manufacturer does not make that claim. That UPS was going to stop what 3 miles of sky could not? A filter will do what a disconnect cannot even accomplish? A filter that will stop a transient but will not stop phone conversation? Those useless plug-in manufacturers have so many brain washed by urban myths.

Polyphaser is an industry benchmark. Polyphaser app notes are highly regarded by industry professionals. What does Polyphaser discuss – their products? Of course not. Polyphaser discusses THE most critical component in every protection system: single point earth ground.
http://www.polyphaser.com/ppc_ptd_home.aspx

Effective protection: every incoming utility first connects short and direct to an earth ground either by direct hardware (cable TV and satellite dish) or via a 'whole house' protector

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(telephone and AC electric). What is the one component that must be in every protection system? Single point earth ground. What is never even discussed by those who recommend that mythical UPS or power strip solution? Single point earth ground.

Which wire is most often struck? Wire highest on pole is a direct connection into every computer, fax machine, smoke detector, bathroom GFCI, furnace controls, etc. What invites lightning to find earth ground via your electronics? AC electric is the one utility wire that typically has no effective protection. Why? We still build as if the transistor did not exist.

You must install the effective protection. That means building must meet or exceed post 1990 earthing requirements of the National Electrical Code. Every incoming AC wire connects less than 10 feet to that single point earth ground via a properly sized 'whole house' protector. Effective devices are even available from Home Depot and Lowes (see above) but have never been seen in Kmart, Sears, Staples, Office Max, Walmart, Target, Radio Shack, Tru-Value, or Circuit City. Those who promote ineffective protectors such as Panamax, APC, Triplite, or Monster Cable will also avoid discussing another critical number: joules.

Effective protection exists inside electronic appliances. Any protection effective on that power cord is already inside that appliance. Internal appliance protection that can be overwhelmed if a human fails to install properly sized and properly earth protection systems – ie the 'whole house' protector.

Meanwhile, how to identify the ineffective protector: 1) no dedicated connection to earth ground and 2) manufacturer forgets to mention the most critical component of every protection system: earth ground.

Again, many would advocate an ineffective plug-in protector without any idea what that protector will do. They don't even know of the protection already inside appliances. They recommend plug-in protectors that can even contribute to damage of the adjacent and powered off computer. Protectors that cost tens of times more money per protected appliance. Protectors that are so often grossly undersized as to fail on a first transient. Bottom line: a protector is only as effective as its earth ground.

Susan wrote:

- > Was asked opinion about computer in office of organization. I
- > suggested that since we often have lightning storms and even though

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- > there is a surge protector, the phone line should be unplugged and
- > I would also unplug the computer from the surge protector before
- > closing the office up.
- >
- > One lady told me that she never unplugs her computer and she never
- > unplugged her stove or refrigerator but she always turned off the
- > surge protector and left everything plugged in.

- **References:**

- ◆ **Lightning and computer?**

- ◇ *From:* Susan

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