

## Re: Whole house surge suppressors

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**From:** w\_tom (w\_tom1\_at\_usa.net)

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Yes communication ports are easily damaged where they are used beyond what they were designed for. Two examples are RS-232 ports and outside speakers to a stereo amp. However first one must ask where was the incoming and outgoing path for that damage.

Does a surge enter on communication port, damage that port, then stop? Of course not. First a complete circuit is established from cloud to earth. After that circuit is conducting electricity through everything in that circuit, only then does something fail. If that circuit is incoming and outgoing via appliance – a condition where 1000+ volts means the 'whole house protector system was defective – then the solution is not to supplement the protector. The solution is to fix the 'whole house' protector and its so critically necessary earth ground.

As noted previously, many communication ports, to communicate with devices not adjacent to the computer, already have effective internal protection. For example NIC (ethernet) port is typically good for in excess of 1000 volts. That is effective protection that can be overwhelmed if the necessary 'whole house' protector system is not installed. Most critical component of that system? Single point earth ground.

Do we fix the single point ground or do we install 'point of use' protectors on every of well over 100 appliances inside the house? Remember, GFCIs in kitchen and bathroom, furnace, electronic timer switch, dishwasher, clock radio, portable phone, microwave, alarm system – are but a few of the electronics that each need a \$15 or \$50 protector if the 'whole house' system is not properly installed. Better and less expensive to fix the 'whole house' (secondary) protection system.

Charles Perry cites a paper that is a 'must read' for anyone who needs surge protection:

<http://www.eeel.nist.gov/817/817g/spd-anthology/files/Enlightening.pdf>

Same authors make same point in an applicaton note for builders and other structural contractors – again must read:

[http://www.pueblo.gsa.gov/cic\\_text/housing/surge/contractors.htm](http://www.pueblo.gsa.gov/cic_text/housing/surge/contractors.htm)

In the Cozy Cabin example, simple principles of single point earth ground are violated. Damage was made possible by human failure. The Rambling Residence suffers from a similar failure. For example, outside speakers are incoming wires that did not first connect to single point ground before leaving the building. Where did that transient enter or leave? The authors suspect induced electromagnetic transient. However those wires easily could have been connected to a direct surge by being buried, routed over conductive materials such as concrete, or even in contact with another conductor – the tree. But again, wires entered the building without first making contact to the single point earth ground system. A blantant violation.

Other suspects could have contributed to the problem. Electrical controls for the sprinkler system also complicate the installation of a single point ground. Where or how did another structure – the exterior pool – connect to building? Were building and pools interconnected at a single point or did they too create ground loops? Both pool and building should have been connected as if each were a separate structure. If not, then the building could have ground loop problems – no single point earth ground existed.

Earthing is the primary solution to surge protection which is also why new homes should have Ufer or halo grounds. Grounding installed before the foundation is even constructed. Purpose is to make earth beneath equipotential – make the single point ground more effective. Plug-in or 'point of use' protectors do not adequately compensate for a defective earthing system. Furthermore those plug-in protectors are typically undersized and grossly overpriced – on the order of tens of times more expensive per protected appliance.

That is the point of that nist.gov paper and so many other industry professionals. Protectors are not the protection. Earthing – the thing often forgotten because it is out of sight – is the most important aspect of surge protection.

And we are only discussing secondary protection. What is the primary protection? Examples of failures in a building's primary protection system:

<http://www.tvtower.com/fpl.html>

Again, the less expensive and essential solution is earthing even in the primary protector system.

"Charles Perry" <pipesandtobacco@hotmail.com> wrote in message news:<2l2bmtF7im90U1@uni-berlin.de>...

- > *The problem is not with the power supply, it is with the communications*
- > *ports. Nine out of ten failed appliances that we examine have failures*
- > *associated with the communications ports. If you don't provide the proper*
- > *TVSS that ties the power and communications references together, then you*
- > *will damage equipment.*
- >
- > <http://www.eeel.nist.gov/817/817g/spd-anthology/files/Enlightening.pdf>

sci.electronics.basics: Re: Whole house surge suppressors

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- > *A very good paper that mentions this.*
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- > *Charles Perry P.E.*