“Understanding Alien Crosstalk in LANs and Methods for Mitigating It”

March 14, 2018

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WiFi is where it’s at!
So what’s the problem???

• The deployment of so-called “Wave 2” 802.11ac wireless access points continues to ramp up
• With multi-gig a reality for users of 802.11ac technologies, the horizontal cabling that provides the backhaul for wireless transmission must be able to support, at a minimum, the same speed
So Will It Work?

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<th>Bundled cabling length</th>
<th>Category 5e</th>
<th>Category 6</th>
<th>Category 6A</th>
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<td>0m &lt;= Bundled cabling length &lt;= 50m</td>
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<td>75m &lt;= Bundled cabling length &lt;= 100m</td>
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<td>5GBASE-T Assured</td>
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ALSNR Risk: High, Medium, Low
Alien Crosstalk Explained and Measured
But what is **ELTCTL**???
New **UH** Research Project

“**ALSNR**” is nothing more than the same old inductive interference issues the telecom industry has been dealing with all these years!

Did someone say **Foreign** EMF???
Fluke ALSNR testing at UH

Cat 5e Ethernet circuit at UH’s AT&T Technology Lab [http://uh.edu/tech/att/]
ALSNR Mitigation Techniques

• Use “Enhanced Performance Patch cords”
• Increase physical separation between cables and ports and unbundle the horizontal cables
• Limit the length of paralleling cables
• Provide additional shielding conductors, such as grounding unused pairs or possible use of POE
• Install Induction Neutralizing Transformers?
1995 Letter to Editor *Cabling Installation & Maintenance* still on the web!


**Grounding and bonding**  
**November 1, 1995**  
Russ Gundrum  
Kingwood, TX

Just wanted to add a few comments to Mark Waller`s article "Grounding and bonding ensure a safe installation" (see September 1995, page 21). **Instead of using modems, opto-isolators or data-port protectors, or replacing copper cable with fiber-optic cabling**, I`d like to suggest a less-expensive and more-effective solution to the problem of induced voltages and currents on data lines. And shielded cable isn`t the answer either--as the telephone industry learned years ago.

Neutralizing transformers were developed more than 60 years ago for use on open-wire telephone lines to reduce induced voltages and currents simultaneously. You don`t need to specify an operating threshold for this device because it doesn`t clamp the circuit and shunt it to ground. There is no time delay, because it operates instantaneously, and it is a multi-pair device, so you only need it at one end of the circuit.  
In the 1960s, large units were built for critical telecommunications and data circuits serving substations and power plants that might be exposed to thousands of volts. In the 1970s, smaller and less-expensive units were designed to suppress hundreds of volts. **Now I`m waiting for one to be designed for the local area network market to solve an even lower voltage problem. Any takers out there?**
References

- Russ Gundrum’s Research Project on Alien Crosstalk at the University of Houston beginning 11/15/17 https://www.researchgate.net/project/ALSNR-is-nothing-more-than-the-same-old-inductive-interference-issues-the-telecom-industry-has-been-dealing-with-all-these-years
- Fluke Networks Application Note: Mode Conversion Testing Prevents Your Network from Hanging in the Balance
- Dr. Paulo Marin’s Fall 2010 BICSI presentation on “Alien Crosstalk Response of Augmented Category 6 Balanced Cables Due to Proximity Effect” https://www.bicsi.org/pdf/presentations/fall_2010/Alien%20Crosstalk%20Response.pdf
- Ron Nordin and Paul Vanderlaan July 2003 IEEE 802.3 Plenary 10G Base-T Study Group Presentation on “Alien Crosstalk Mitigation Technique” www.ieee802.org/3/10GBT/public/jul03/nordin_1_0703.pdf
- Leviton Tech Brief “Structured Cabling Considerations for 2.5GBase-T and 5GBase-T” https://www.leviton.com/Resources/Leverage%20Structured%20Cabling%20Considerations%202.5GBase-T
- Fluke Networks’ Datasheet: DSX-5000 CableAnalyzer™
- Fluke Networks’ Blog by Barry Lindsley on July 21, 2016 “All About Alien Crosstalk Measurement”
Questions??????

For more information please contact:

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Appendix
Introducing...the Best Protector on the market today...the SNC

Telecommunication Interference Filter

Is your telecommunication terminal equipment (PBX, key systems, alarms, data modems, etc.) experiencing these problems:

- False rings or signaling malfunctions?
- Uncontrollable electronic equipment failure or damage?
- Noisy circuits?
- Unusual AC voltages on the line terminals?
- Excessive "secondary" protector operations sporadically shutting the system down?
- Can't tell or receive calls on occasion?
- Instability on data circuits causing errors?

The solution to these problems may be an SNC Telecommunication Interference Filter (TIF).

The TIF is the best protector on the market today (when coupled with the appropriate company provided "primary" protector) because it will substantially reduce:

- Steady-state or transient 50/60 Hz power line induced AC voltages up to 500 volts rms.
- Excessive power interference levels (induced harmonic voltages and currents) that can cause circuit noise.

It does all of this instantaneously and on a continuous basis without disrupting the circuit's operation.

Find out why over 400,000 telephone, railroad and power utility communication and signaling circuits around the world have utilized this equipment for the last 33 years to keep their lines in service.

For more information, contact:

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TLC - Telecom Line Conditioner