

Questions and Answers About Arc Fault Circuit Interrupters

These circuit breakers are becoming common, but some earlier models may cause problems for radio amateurs.

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An Arc Fault Circuit Interrupter (AFCI) is a type of circuit breaker that detects current patterns that indicate the presence of an electrical arc — a leading cause of home fires. The National Electric Code (NEC) now requires AFCIs in most areas of residential buildings.

An AFCI is not supposed to trip because of “normal” arcs that occur from motors, switch contacts, or when a plug is removed. Nor is an AFCI intended to trip because of RF energy from a nearby transmitter, if the transmitter is being operated properly. However, in late 2012, amateurs began to report instances of AFCIs tripping in the presence of strong signals.

The ARRL Laboratory discovered that one AFCI model manufactured by Eaton Corporation was particularly susceptible to radio frequency interference (RFI) at certain wavelengths. After ARRL Headquarters spoke with Eaton engineers in 2014, the company redesigned their AFCIs to correct the problem.

Thanks to improvements over time, AFCI interference complaints to the ARRL Lab have become rare. However, you could still find yourself embroiled in an interference issue involving *older* models. Here are some basic things to know about AFCIs.

Q. What are the symptoms of RF interference to an AFCI? How would I know if AFCIs are tripping due to a nearby transmitter?



A. Nuisance tripping from a nearby transmitter will typically involve more than one AFCI in the affected breaker panel tripping simultaneously. Obviously, if the source transmitter is under your control, you’ll notice that the breakers will trip whenever the transmitter is keyed.

Q. What legal protections do AFCI devices receive from interference caused by licensed radio services, including Amateur Radio?

A. None. According to Federal Communications Commission rules, (described in Title 47, Part 15, of the Code of Federal Regulations), an AFCI and any other so-called “Part 15” device must accept interference by authorized radio stations, which includes Amateur Radio stations.

Q. How should I correct nuisance tripping caused by RFI?

A. Chances are, your RFI headaches are being caused by an older model AFCI. Change the problematic AFCI to a newer model, and you’ll likely solve the problem.

Hams who are experiencing unwanted tripping may wish to contact the breaker manufacturer for assistance. If the problem involves an Eaton breaker, e-mail Eaton’s Technical Resource Center at trc@eaton.com, or call 1-800-326-9513. To their credit, Eaton has been replacing the problematic AFCI’s with the newer models to correct RFI issues.

Q. I think my neighbor may be having RFI issues with his AFCI breakers. I’d like to help, but I’m concerned that my neighbors may think that I am the cause of this problem, as well as any other interference issues that may be occurring.

A. Without admitting fault, simply suggest to your neighbor that a radio signal might be the cause — without being specific about where the signal is coming from. Tell him to contact the AFCI manufacturer. If he has Eaton breakers installed, give him the contact information for their Technical Resource Center.

You can download a PDF copy of this article from the ARRL website at www.arrl.org/afci-devices.

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