

building or structure. A common error is often made when grounding community antenna television (CATV) systems. Many times, the coaxial cable sheath is connected to a rod-type grounding electrode driven by the CATV installer at a convenient location near the point of cable entry to the building, instead of bonding it to the electrical service grounding electrode system. This creates two grounding electrode systems at the same structure and potentially creates a difference in potential between the electrodes. This can result in a difference in potential between the grounded components connected to the sheath of the coaxial cable and any other electrical equipment that is grounded to the electrode for the other building systems.

Section 250.94 requires that the intersystem bonding termination (IBT) device have three or more termination points that are accessible and external to the service equipment for making the bonding and grounding connection for other systems. For existing installations where an intersystem bonding termination is not available, alternative bonding means are described in 800.100(B)(2). A separate grounding electrode is permitted by 800.100(B)(3) only if the building or structure has neither an intersystem bonding termination nor a grounding means, which is rare. The earth cannot be used as the bonding conductor, as specified in 250.54, because it does not provide the required low-impedance path.

Both communications systems and power systems are subject to current surges. If the grounded conductors and parts of the two systems are not bonded by a low-impedance path, such line surges can raise the potential difference between the two systems to many thousands of volts. This can result in arcing between the two systems — for example, wherever the coaxial cable jacket contacts a grounded part, such as a metal water pipe or metal structural member — inside the building.

If a person is the interface between two systems that are not properly bonded, a high-voltage surge could result in electric shock. More common, however, is burnout of a television tuner, a part that is almost always an interface between the two systems. The tuner is connected to the power system ground through the grounded neutral of the power supply, even if the television set itself is not provided with an equipment grounding conductor (EGC).

See also

250.92(B) and its commentary for more information on bonding for services

800.106 Primary Protector Grounding and Bonding at Mobile Homes.

(A) Grounding. Grounding shall comply with 800.106(A)(1) and (A)(2).

- Δ **(1) Mobile Home Service Equipment.** Where there is no mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- (1) The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3):
 - a. Primary protector grounding terminal
 - b. Network interface unit
 - c. Coaxial cable shield ground
 - d. Surge arrester grounding terminal
 - e. Network-powered broadband communications cable shield
 - f. Network-powered broadband communications cable metal members not used for communications or powering
- (2) The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(1). The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(1)(1). The grounding electrode shall be bonded in accordance with 770.106(B).

(2) Mobile Home Feeder Disconnecting Means. Where there is no mobile home disconnecting means grounded in accordance with 250.32 and located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, grounding shall comply with one of the following:

- (1) The following components (if present) shall be connected to a grounding electrode in accordance with 800.100(B)(3):
 - a. Primary protector grounding terminal
 - b. Network interface unit
 - c. Network-powered broadband communications shield
 - d. Network-powered broadband communications cable metal members not used for communications or powering
- (2) The non-current-carrying metal members of optical fiber cables shall be connected to a grounding electrode in accordance with 770.106(A)(2). The network terminal, if required to be grounded, shall be connected to a grounding electrode in accordance with 800.106(A)(2). The grounding electrode shall be bonded in accordance with 770.106(B).

(B) Bonding. The primary protector grounding terminal or grounding electrode, network-powered broadband communications cable grounding terminal, or network interface unit grounding terminal shall be bonded together and connected to the metal frame or available grounding terminal of the mobile home with a copper conductor not smaller than 12 AWG under either of the following conditions:

- (1) If there is no mobile home service equipment or disconnecting means as in 800.106(A)
- (2) If the mobile home is supplied by cord and plug