ARTICLE

810 RADIO AND TELEVISION ANTENNA EQUIPMENT

Introduction to Article 810—Radio and Television Antenna Equipment

Unlike other articles in this chapter, Article 810 is not covered by the general rules in Article 800; as a result, it stands completely alone in the *NEC* unless a rule in 810 references a specific rule elsewhere in the *Code*.

This article covers transmitter and receiver (antenna) equipment, and its associated wiring and cabling. Here are a few key points to remember about Article 810:

- Keep the bonding conductor or grounding electrode conductor as straight as practicable and protect it from physical damage.
- If the mast is not bonded properly, you risk flashovers and possible electrocution.
- Remember that the purpose of bonding is to prevent a difference of voltage between metallic objects and other conductive items, such as swimming pools.

Note: See Figure 800(a) and Figure 800(b) in the *NEC* for examples of bonding conductors and grounding electrode conductors.

810.21 Bonding Conductor and Grounding Electrode Conductors

Bonding conductors and grounding electrode conductors must meet the requirements of 810.21(A) through 810.21(K).

(A) Material. The bonding conductor to the intersystem bonding termination or grounding electrode conductor to the grounding electrode [810.21(F)] must be copper, copper-clad aluminum, or other corrosion-resistant conductive material. ▸Figure 810–7

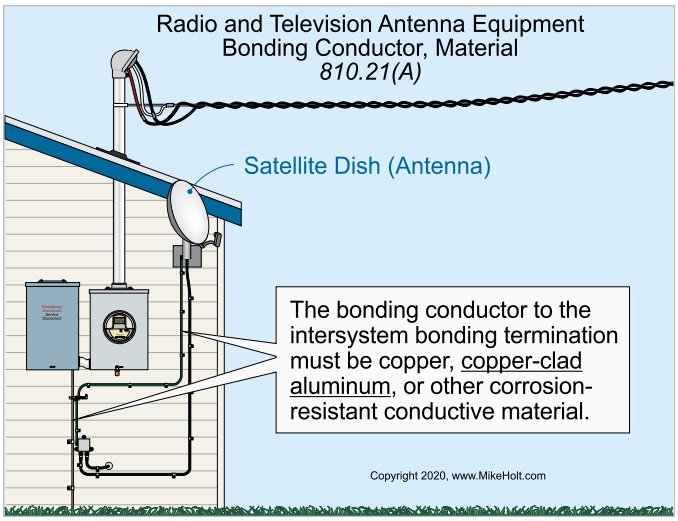
(B) Insulation. Insulation on bonding conductors or grounding electrode conductors is not required.

(C) Supports. The bonding conductor or grounding electrode conductor must be securely fastened in place.

(D) Physical Protection. Bonding conductors or grounding electrode conductors must be mechanically protected where subject to physical damage; and where installed in a metal raceway, both ends of the raceway must be bonded to the contained conductor.

Author's Comment:

- Installing the bonding conductor or grounding electrode conductor in PVC conduit is a better practice.



▸Figure 810–7

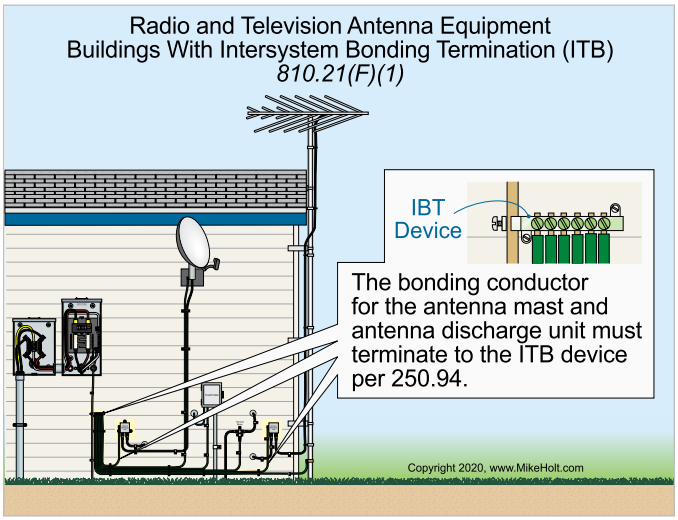
(E) Run in Straight Line. The bonding conductor or grounding electrode conductor must be run in as straight a line as practicable.

Author's Comment:

- Lightning does not like to travel around corners or through loops, which is why the bonding conductor or grounding electrode conductor must be run as straight as practicable.

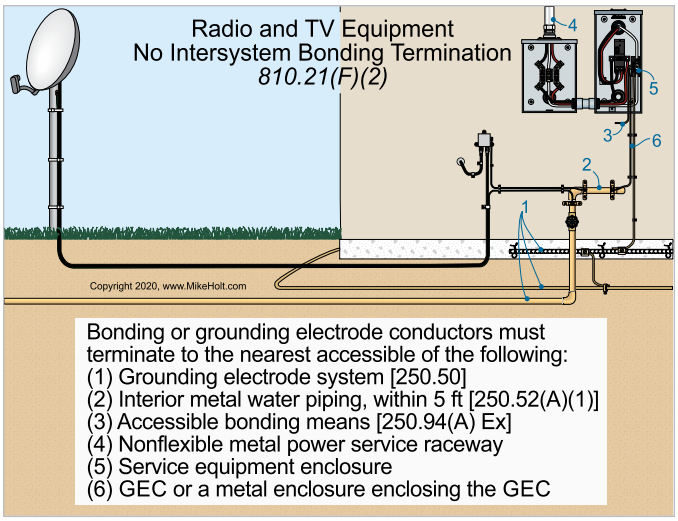
(F) Electrode. The bonding conductor or grounding electrode conductor must terminate in accordance with (1), (2), or (3).

(1) Buildings with an Intersystem Bonding Termination. The bonding conductor for the antenna mast and antenna discharge unit must terminate to the intersystem bonding termination [Article 100] as required by 250.94. ▸Figure 810–8



▸Figure 810–8

(2) In Buildings Without Intersystem Bonding Termination. The bonding conductor or grounding electrode conductor for the antenna mast and antenna discharge unit must terminate to the nearest accessible: ▸Figure 810–9



▸Figure 810–9

(1) Building grounding electrode system [250.50].

(2) Interior metal water piping system, within 5 ft from its point of entrance [250.52(A)(1)].

(3) Power service accessible means external to the building as covered in 250.94, including the exception.

(4) Nonflexible metal power service raceway.

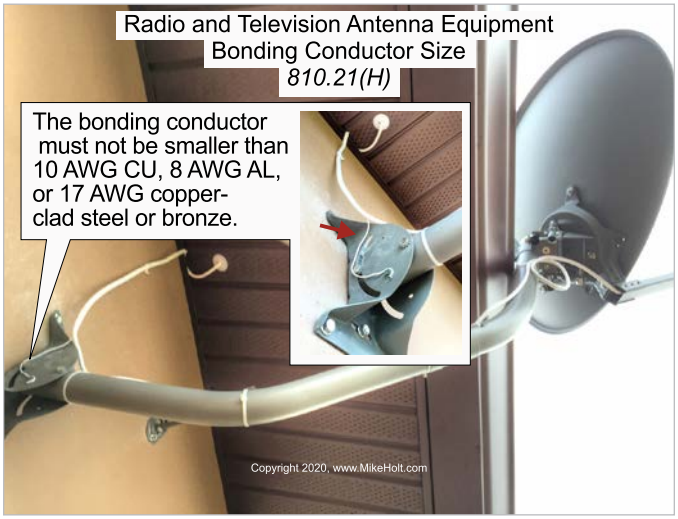
(5) Service-disconnect enclosure.

(6) Grounding electrode conductor or the grounding electrode conductor metal enclosure.

(3) In Buildings Without a Grounding Means. The grounding electrode conductor for the antenna mast and antenna discharge unit must be connected to a grounding electrode as described in 250.52.

(G) Inside or Outside Building. The bonding conductor or grounding electrode conductor can be installed either inside or outside the building.

(H) Size. The bonding conductor or grounding electrode conductor is not permitted to be smaller than 10 AWG copper or 17 AWG copper-clad steel or bronze. ▸Figure 810–10



▸Figure 810–10

(J) Bonding of Electrodes. If a ground rod is installed to serve as the grounding electrode for the radio and television equipment, it must be bonded to the building's power grounding electrode system with a minimum 6 AWG conductor. ▸Figure 810–11

Author's Comment:

- A separate grounding electrode is not required for radio and TV equipment, but if it is installed it must be bonded to the building's power grounding electrode system with a minimum 6 AWG conductor.

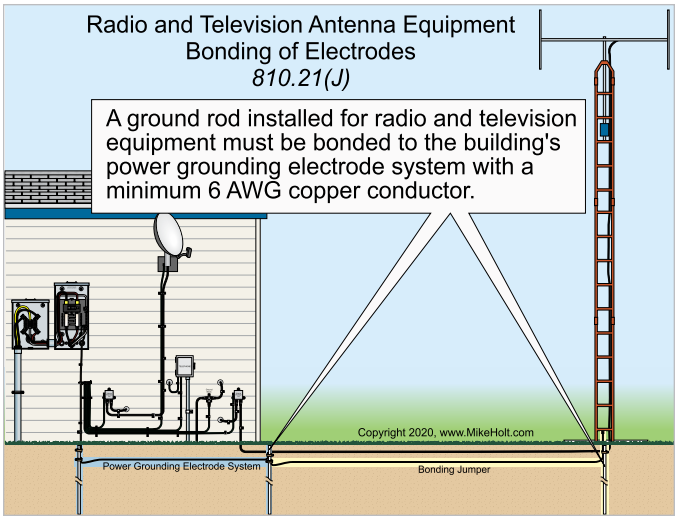


Figure 810–11

- The bonding of electrodes together helps reduce induced voltage differences between the power and communications systems during lightning events. Figure 810–12

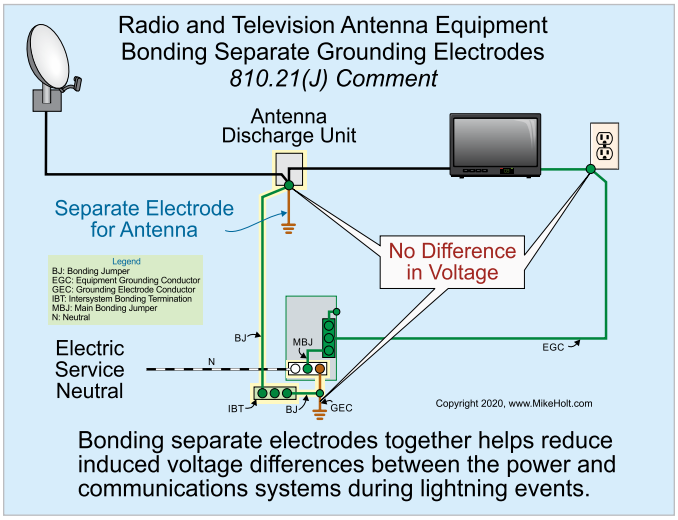


Figure 810–12

(K) Electrode Connection. Termination of the bonding conductor or grounding electrode conductor must be by exothermic welding, listed lugs, listed pressure connectors, or listed clamps. Grounding fittings that are concrete-encased or buried in the Earth must be listed for direct burial in accordance with 250.70. Figure 810–13

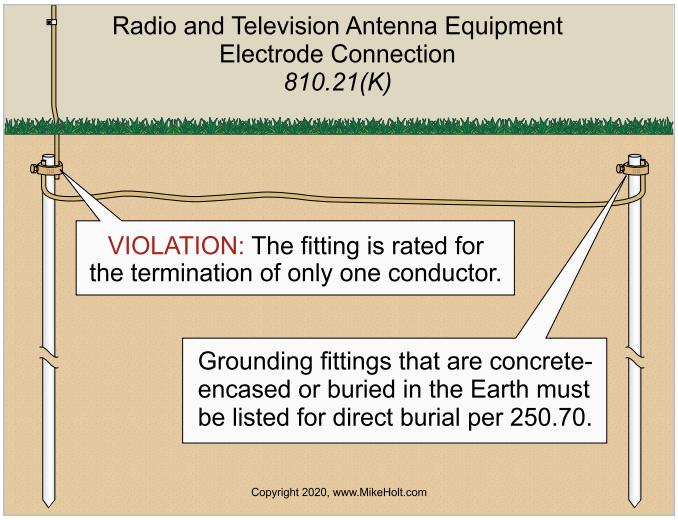


Figure 810–13

Author's Comment:

- Grounding the lead-in antenna cables and the mast helps prevent voltage surges caused by static discharge or nearby lightning strikes from reaching the center conductor of the lead-in coaxial cable. Because the satellite dish sits outdoors, wind creates a static charge on the antenna as well as on the cable to which it is attached. This charge can build up on both the antenna and the cable until it jumps across an air space, often passing through the electronics inside the low noise block down converter feedhorn (LNBF) or receiver. Connecting the antenna and satellite dish to the building's grounding electrode system (grounding) helps dissipate this static charge.
- Nothing can prevent damage from a direct lightning strike, but grounding with proper surge protection can help reduce damage to the satellite dish and other equipment from nearby lightning strikes.