Article 810 covers antenna systems (including satellite dishes) for radio and television receiving equipment, and amateur and citizen band radio transmitting and receiving equipment.

Figure 810-1

- Roof-mounted antennas for AM/FM/XM radio reception.
- Amateur radio transmitting and receiving equipment, including HAM radio equipment (a noncommercial [amateur] communications system).

**ANALYSIS:** Citizen band (CB) radio antennas are very similar to amateur (HAM) radio antennas. They're both exposed to the same environmental and atmospheric conditions, such as lightning, wind loading, and clearance to overhead conductors. Due to these similarities, it makes sense to incorporate these systems into Article 810.

The title of Part III of this article was also revised to reflect this change, as were the titles of 810.51 and 810.58(A).

**PART II. RECEIVING EQUIPMENT—ANTENNA SYSTEMS**

**810.21 Bonding Conductors and Grounding Electrode Conductors**

This section has been revised extensively to provide consistency with changes made to grounding related terms.

**810.21 Bonding Conductor or Grounding Electrode Conductors.** The antenna mast [810.15] and antenna discharge unit [810.20(C)] must be grounded as follows. **Figure 810-2**

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 attached to it. 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 coaxial cable and dish to the building grounding electrode system (grounding) helps to 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.

(A) **Material.** The bonding conductor or grounding electrode conductor to the electrode [810.21(F)] must be copper or other corrosion-resistant conductive material, stranded or solid.

(B) **Insulation.** Insulated, covered, or bare.

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

(D) **Mechanical Protection.** The bonding conductor or grounding electrode conductor 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 bonding conductor or grounding electrode conductor; **Figure 810-3**
810.21 (D) — Grounding Conductors - Mechanical Protection

The bonding conductor or GEC must be guarded from physical damage. Where run 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.

**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 doesn't 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).

**I) Buildings or Structures With an Intersystem Bonding Termination.** The bonding conductor for the antenna mast and antenna discharge unit must terminate to the intersystem bonding termination as required by 250.94 [Article 100 and 250.94]. **Figure 810-4**

**Intersystem Bonding Terminal: A device that provides a means to connect bonding conductors for communications systems to the grounding electrode system.**

**Note:** According to the Article 100 definition, an Intersystem Bonding Termination is a device that provides a means to connect bonding conductors for communications systems to the grounding electrode system, in accordance with 250.94. **Figure 810-5**

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