

The coaxial antenna feeder cable or waveguide is the primary source of damaging lightning energy to equipment at a communications site. When struck by lightning, the tower acts like a voltage divider. For a few nanoseconds, there will be a high peak voltage at the top referenced to zero voltage at the base. Current will then flow through the tower and all attached conductors. See [Figure 1](#).

If the bottom coaxial cable/waveguide ground kit is at any elevation above the earth, the overall inductance to earth of the tower below the ground kit, the series inductance of paralleled coaxial cables/waveguides to the building, and the paralleled entry panel ground conductors can be high enough to cause a substantial inductive voltage drop. The resulting voltage on the coax shield/waveguide will drive current to the equipment where other I/Os and the electrical safety ground can provide a path to ground through the equipment chassis.

The best way to prevent lightning caused coaxial shield currents from reaching equipment is to minimize the peak voltage at the building entry panel. See [Figure 2](#). This may be accomplished by installing, on the inside of the building, a continuous conductive ground plane bonded to the building ground system. The large surface area ground plane is necessary to provide a low inductance path to ground for the entry panel's lightning surge current, as well as provide for the high frequency component to minimize the resulting inductive voltage drop. Each coax cable/waveguide is attached to the panel with a grounded protector/feed through or a ground kit.

continuous surface area “single point ground” plane from the coaxial cable/waveguide entry

A continuous surface area ground plane: keeps inductance low with

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