**Station Grounding – KI5DYC**

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According to ARRL, station grounding is probably the most discussed subject in amateur radio and it is also the one replete with the most misconceptions. The first thing to know is that there are three functions served by grounding in ham shacks:

1. Electrical Safety

2. Stray RF Suppression (or simply RF Grounding)

3. Lightning Protection.

Each has it's own set of requirements, but not all station setups need every kind of ground. In fact, some setups don't use a ground at all! With that in mind, you may ask , how important a good ground system is? Most people will tell you that grounding is all- important, a few people tell you that grounds aren't necessary. As stated earlier, Grounds fulfill three distinct functions. The best ground for one function isn't necessarily the best for another. The three are:

a. **Safety ground**. This protects you from a shock hazard if one of the mains or high voltage power supply wires contacts the chassis due to some kind of fault. The requirements for this ground are spelled out in your state's electrical code. I believe that most states adopt the National Electrical Code (NEC). The safety ground conductor in your wall sockets should be connected to ground according to this code, and your rig's chassis should be connected to the safety ground through the wall socket. You’ll want to check the ground in your home to make sure it’s set up correctly.

b. **Lightning ground**. The requirements for a ground for lightning protection are much more stringent than for a safety ground. The topic has been discussed in ARRL group many times, and there are numerous resources available for learning how to make a ground system for lightning protection. I encourage you to do some research before you set your lighting protection up.

c. **RF ground**. This is required only for certain types of antennas-- ones which require current flow to ground to complete the antenna circuit. An example is a quarter-wave vertical. One wire of the feedline connects to the base of the antenna, and the other connects to ground. The connection to ground has to have a low RF resistance, or you'll expend too much of your power heating the ground. A few radial wires will provide a moderately low loss connection. A ground rod will help a little, but the RF resistance will be high, resulting in quite a bit of loss. Chapter 8 of the ARRL Antenna Book shows the approximate trade between resistance and number of radials. If your antenna is much shorter than ¼ wavelength, you'll need many, many radials to get reasonable efficiency. If it's longer, you can get by with fewer. A ½ wavelength base-fed vertical needs only a very modest ground, and a ground rod is adequate. The requirements for various other end-fed antennas depend on their length. If you use a "complete" antenna like a dipole or a ground plane (that is, one that doesn't require your feedline to connect to ground), you don't need a RF ground, as long as you keep common-mode currents off your feedline. A "current" or "choke" balun is most commonly used for this.