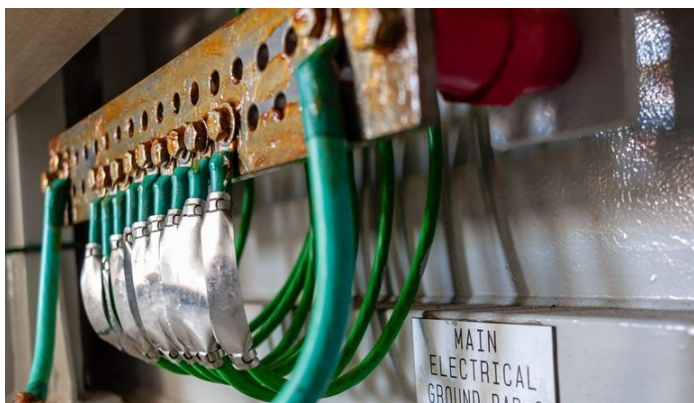


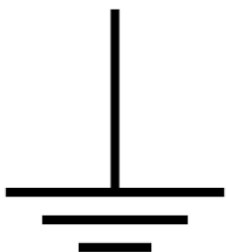
Microvolt

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Let's talk about Grounding



Soon after entering the craft, many amateurs become aware of the need for *grounding* their equipment. Yet, anybody who has seen questions about grounding posted on social media is aware of the many, often conflicting answers that appear from self-proclaimed grounding experts. Exactly what is grounding, why is there so much disagreement over it, and why should we care about it? Let's take a closer look at this important but embattled topic.

Cover story	2
Editorial	3
Letters to the editor	4
Club news	5
For your information	6
Spotlight on K7FUI	8
Tech corner	9
Strays	12

Cover – Grounding

An electrical **ground** is a reference point in an electrical circuit from which voltages are measured, but it can also be a common return path for electrical current, or a direct physical connection to the Earth itself. **Grounding** (*earthing* in the UK), therefore, is the process of providing a conductive pathway between an electrical system and a ground.

Some of the controversy surrounding grounding lies in whether to ground, what to ground, and how to ground it. Disagreements, even among experts, often stem from urban legend (*That's how we've always done it!*) without empirical data. Many claim that they have never grounded their equipment, and have operated for decades without problems due to lack of grounding. Grounding is a little like car insurance, it seems like a waste, until you need it.

In spite of controversy or folklore, we recommend the ARRL book *Grounding and Bonding for the Radio Amateur*, the recommended final word for most grounding questions.

Should I ground my station?

Whether you should ground something comes down to why it should be grounded at all. The most important reason to ground your station is for **safety**, not performance. Your HT (handheld transceiver) contains a self-contained “ground” made of its chassis, to complete its **ground plane**. But a safety ground is only necessary when you connect your HT to an outdoor antenna or other external conductor, where large amounts of static can collect from wind, dust, and moisture.

Many hams are tempted to ground their transceivers to reduce the noise they hear on HF. In general, grounding will not reduce your received noise. Then again, grounding can help with phase noise and noise generated by common-mode current. Also, in most cases, grounding will not help with antenna performance (receive better, transmit better, greater efficiency, etc.) If you do find that grounding your transceiver or antenna actually does help with performance, you likely have an antenna problem, not a grounding problem.

Still, you might convince yourself that grounding your rig won't hurt anything, and it can only help. Most modern transceivers are powered by DC (direct current), and are not subject to the dangerous volt-



ages presented by house current entering the rigs. For this reason, they really don't need their chassis grounded; in fact, doing so can create a ground loop, which can generate unwanted noise.

Bonding

When discussing grounding, one important sub-topic that necessarily arises is **bonding**, which is not the same. Bonding means the combination of two practices: 1) electrically connecting multiple conductors in an effort to bring them to the **same electric potential**, and 2) bringing to ground potential those conductors that normally are **not intended to carry electrical current**.

For example, your metal refrigerator door should not normally conduct the 120 VAC that's supplied to the compressor motor or the fan. But if a house current wire inside became frayed or loose by vibration, it can accidentally contact the door from the inside and give the person a wakeup call, should he or she come in contact with the door. In this case, the fridge chassis should be bonded with the outlet ground, provided by the ground (third) pin of the wall outlet to prevent such a shock. If the wire then loosened while the chassis is bonded, the contact should cause the breaker to pop (open) at the panel, preventing an unwanted experience.

An unrelated word of caution: fuses and breakers are installed for a reason. If one repeatedly opens, simply replacing the fuse or resetting the breaker won't solve the problem that caused it to pop in the first place. When the breaker trips, be sure you know why it tripped before blindly resetting it. It might be nothing, or it might be your house circuit telling you that something on it wants to burn your house down.

Microvolt editorial staff