

The Electronic Halo Might Have Horns: Batteries, Beacons and Smartphones

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I never thought I'd be concerned about my electronics while cruising around the backcountry, but I am. Carrying a cell phone, satellite phone, GPS, avalanche beacon, SPOT Messenger, and a VHF radio means my electronic signature rivals a high tension power line. I hope I don't have to start lugging around a car battery to keep everything powered. Most people in the backcountry are not as wired as me, but a smartphone and beacon are staples for most backcountry travelers. The beacon is a literal lifeline, the most important piece of electronic safety equipment we carry. Its function is crucial to survival. As I slowly added to my electronic arsenal over the years I began to wonder, "Do all these other devices interfere with the function of my avalanche beacon?"

The answer is, yes.

Other devices, smartphone included, interfere with beacons in *Search* mode, causing them to become erratic and read false distances to the buried person which would slow and hamper a rescue, potentially enough to mean the difference between a life and a death. Luckily, these same devices will not significantly interfere with a beacon in *Transmit* mode. Studies show that keeping a phone or other gadget eight inches away from a transmitting beacon greatly limits interference. If I'm ever buried and gasping for air I'll metaphorically rest easy knowing that my beacon is working just fine even though the lid of my pack is stuffed with digital comms and knowing that a metaphor and reality are not the same thing.

These same studies found that during a beacon search interference can be limited by straightening your arm and keeping the transceiver 1 ½ feet away from your body and pack. To be even safer, preventatively turn off or put in airplane mode all these devices (except, of course, the avalanche beacon). If extraneous devices are off they can't interfere with an avalanche rescue. Even more satisfying is that you are now free to concentrate on making turns instead of talking with your boss or explaining where you are to your mom. For more details on studies about interference check out Mark Staples' blog post on our website (<http://www.mtavalanche.com/blogs>).

Avalanche beacons are powered by either AAA or AA batteries. It's wise to start every season with a fresh set. New batteries deliver longer power and better performance to our life-saving devices. Once a beacon's battery power falls below 70% spend a few bucks on new ones. Be aware that all batteries are not created equal. Alkaline are the very best while rechargeable and lithium ones should be avoided. Rechargeable batteries do not last long. Searching with an avalanche beacon requires generous power, and rechargeable batteries, while environmentally sensitive and economical, do not have what it takes when life or death is at stake. Though lithium batteries last a very long time they have another problem—they die without warning. A battery meter on a beacon can read 90% life with lithium power at the start of your day and suddenly drain to zero by the end. Since the drop off is not gradual it is impossible to accurately determine how much battery life is ever left. Alkaline do not have this problem because they release power gradually, allowing the meter to read correctly.

Smartphones are near ubiquitous and many apps are helpful to anyone traveling in the backcountry. There are a few backcountry apps that are gaining popularity but are not very accurate. One such app is an electronic inclinometer to measure slope angle, an important measurement for identifying avalanche terrain. I found out about the bogus app just the other day when my \$20 inclinometer showed 34-degrees steepness, and my partner's iPhone showed 30-degrees. My manual one was correct, his phone not. This difference is not trivial since 34-degrees is squarely in avalanche terrain while 30 degrees is only barely. If you use an inclinometer app, make sure you test it side by side against a real one before betting your life on the slope angle.

This fall, three European smartphone apps hit the market as cheaper alternatives to carrying an actual avalanche beacon. Using a phone's GPS they can help you locate your buried partner if he also has the exact same app. The problems with these apps are too numerous to recount. **DO NOT USE THEM.** Their precision would be laughable if it wasn't so dangerous. Their "best reported accuracy" for finding someone is 15 feet, far too wide a swath to pinpoint a buried, and soon to be dead, friend.

New technology, like all technology, can be useful, but it has limitations. Pay attention to what you carry and where you carry it, choose your batteries wisely and don't be fooled by new, slick apps that claim to shortcut very important basic functions, like a beacon search.