

On the Hunt: 2010 Avalanche Beacon Recap

Contributed by Lance Riek

For a complete review of 2011's newest beacons, pick up the January issue of Backcountry Magazine. In the meantime, here's a rundown of last winter's best beacons and our test procedures from the January 2010 issue.

You've just been buried by an avalanche. You're panicking, running out of air, growing lightheaded. This is no time to worry about your partner's dated beacon and rusty skills. There's no replacement for plenty of search practice, but beacons have come a long way since the days of analog and headphones. With better range, smoother, faster pinpointing, and multiple-victim management and marking, any one of the following beacons is a serious step up from models just a few years old. Backcountry hopes you never need to use one in a real avy situation, but we're confident that these six beacons will perform when you—or your partners—need them most.

TESTED BEACONS:

The Test Setup

Five testers were chosen for their wide range of beacon experience, from professional to never-ever. Outdoor testing totaled more than 20 hours, conducted in large fields, away from power lines, homes, cell phones, and other interference, and each tester completed single burial and three-victim multiple burial scenarios. To simulate burial depth with only a foot of snow on the ground, testers held the beacons at stomach height for pinpointing, instead of directly on the snow. Multiple burial setups included an easy scenario with beacons separated by three to five meters, and a grueling scenario with three beacons buried within four meters, with two only 1.5 meters apart.

TESTER BIOS »

Results

Good news: you should feel comfortable carrying (or having your partner carry) any one of these three antennae beacons. In single burials, every beacon performed nearly flawlessly for all testers, but differences became clear in how beacons managed multiple-burial scenarios. Certain features evoked strong preferences in testers, but there was ultimately one unanimous winner. When asked—after completing their testing—which beacon they would choose, all testers selected the Barryvox Pulse, Backcountry's 2010 Editors' Choice beacon.

{mospagebreak title="Backcountry Access Tracker2"}

Backcountry Access Tracker2 (Preproduction model)

\$335

Search-strip Width: 40 meters

backcountryaccess.com

Editor's Note: The Tracker2 we tested [for January 2010] was a prototype, so final production performance may vary significantly. The production model was later tested and a complete review can be found in the January 2011 issue of Backcountry.

The much-anticipated Tracker2 improves upon the popular Tracker DTS with a third antenna, smooth pinpointing, significantly increased range, multiple-signal indicator, plus updateable software.

Range:

In our testing, the range was 8-10 meters greater with the Tracker2 than the long-lived and popular Tracker DTS. With an average range of 40 meters and the average of the lowest 10% at 24 meters, the Tracker2 is competitive with any of the longer-range beacons.

Secondary Search:

Testers found the increased range of the T2 over the DTS comforting, allowing them to start their secondary search sooner. The distance and direction were consistently displayed, and, as the professor commented, "smooth, with no pausing at all." The avy pro felt his searches were faster overall with the Tracker2 than with the DTS (his personal beacon).

Pinpointing:

With the third antenna, the Tracker2 pinpoints far more reliably than the DTS, and as well as any other three-antenna beacon: the lowest distance number is displayed directly above the burial. Nearer than two meters, the directional arrows disappear, reinforcing the need to pinpoint—a small, but crucial refinement, as at least one tester found the jittery arrows of the DTS distracting while pinpointing at close range.

Multiples:

The Tracker2 recognizes multiple signals, but won't specify how many, nor will it allow you to mark, or mask found signals. The function worked consistently, and the signal indicator LED was easy to see. It is designed to flash when multiple transmitters are within five meters, but this feature was hit or miss. With three beacons 1.5 to 3 meters apart, the Tracker2 would not stay locked on to one signal. Finding the beacons required drastically slowing down the pinpoint search.

With three transmitters separated by 4-6 meters, testers found them easily with common multiple-burial techniques like the Three Circle Method. Testers repeatedly commented positively that there were far fewer "missed" or not displayed pulses than with the DTS, which led to faster search times.

Ergonomics:

The Tracker2 uses an intuitive push/pull, transmit/receive switch. Like the DTS, the Tracker2 displays the direction and distance with red LEDs. Testers found the high-contrast display "easy to see, and therefore, easier to understand." The pouch-style harness has been redesigned to be lighter, with comfortable, low-profile straps.

Pros:

The Tracker2 improves on the widely used DTS with better range, more accurate and smoother pinpointing, and far fewer missed pulses for overall faster searches. The \$335 price tag is also lower than some of the competition.

Cons:

The Tracker2 doesn't have masking/marking for multiple-burial assistance, and battery consumption was significantly higher than other beacons. Production performance remains uncertain.

{mospagebreak title="ARVA Evo 3"}
ARVA Evo 3

\$299

Search-Strip Width: 40 meters

wasatchski.com

The Evo3's LCD screen displays direction with five arrows and distance numbers. It indicates the presence of multiple transmitters (but won't tell you how many), and has a marking function. The Evo3 is not software updatable.

Range:

In testing, the ARVA's range averaged 29 meters, but more importantly, deviation from this average was small. It didn't detect signals from as far away as some beacons could, but even at its worst, range remained a very respectable 21 meters, and the average of the lowest 10% is on par with the S1.

Secondary Search:

All testers noted that both the direction arrow and the distance indicator "bounced around too much" at longer range (greater than 20 meters). But they agreed that it wasn't a huge issue, since after closing the distance to about 20 meters, both direction and distance were smooth and consistent. The Evo3 retains directional arrows down to two meters.

Pinpointing:

The ARVA's audio "beeping" increases in frequency and pitch as the distance to a victim decreases, and displayed distance numbers during testing were consistent. Occasionally, at longer pinpointing ranges of two or three meters, the display was slow to update small distance readings, but all testers succeeded in precisely pinpointing single burial scenarios.

Multiples:

By quickly flipping the transmit/receive switch back and forth once, the Evo3 will mask the strongest transmitting signal and allow searchers to hone in on the next-strongest signal in a multiple-burial scenario. The masking functioned very well in all cases but one: a difficult test with three beacons located within 1.5 to three meters of each other. The Evo3 failed on a few tries to mask the first found beacon, though it allowed the tester to quickly pinpoint and mask the other two. While not as sophisticated as some, ARVA's masking of multiple burials is effective in all but the most challenging scenarios.

Ergonomics:

The Evo3 powers on by plugging in the end of the harness eliminating the chance of touring with a turned-off beacon. Wide harness straps secure the Evo3 comfortably, but female testers found the transmit/receive switch hard to operate with gloves. The distance display is large and easy to read.

Pros:

The Evo3 is a lot of beacon—three antennae, multiple indicator, masking function, 40-meter search-strip—for the money, an excellent value. One tester concluded, "I'm liking this one—good audio, effective on multiples. I'm going to buy one as an extra beacon for visiting relatives and friends."

Cons:

It didn't perform as well as some others on the most difficult multiple-burial scenario.

{mospagebreak title="Barryvox Pulse"}
Barryvox Pulse

\$450

Search-strip Width: 50 meters

mammut.ch

This season, the Pulse software update provides user-friendly display refinements, increased range, and two user profiles: "Advanced," similar to earlier versions, and "Basic" with fewer settings and controls. Buried Pulse units transmit information (to receiving Pulse beacons) about victims' tiny movements, alerting searchers to live burials. Older software can be upgraded for \$30 at a retailer, or by returning the unit to Mammut USA.

Range:

The Pulse had the highest average range of any beacon tested, at 42.2 meters, and the upgraded software improved the lowest 10% range average by seven meters over previous versions, to 25.5 meters, placing it on par with the Tracker2 and DSP. An audio indicator alerts the user when the Pulse first picks up a signal during the initial search.

Secondary Search:

Using its compass to compensate for small, inadvertent user rotations, the Pulse's "floating" directional arrow doesn't jump around. The pro noted, "I feel like this is "steering" me right in, better than others." The distance numbers are noisy at the longest ranges, but settle quickly and decrease smoothly.

Pinpointing:

While the pinpoint distance numbers change smoothly, even at close range, it's the audio that sold the testers. Frequency and pitch increases as distance to the victim decreases (and vice versa), and the clear feedback on whether they were going in the right direction was intuitive for all the testers, pro to eight-year-old.

Multiples:

The marking feature worked well in all test cases, including the difficult close burial of three transmitters separated by 1.5 and 3 meters. The pro described its performance on multiples in one word: "solid."

Ergonomics:

The Pulse uses a plastic beacon holder to help detect the small breathing movements of a buried victim for the Pulse triage feature. The straps are lightweight and comfortable. But two testers commented that they didn't like the

off/send/search switch, and said it was unnecessarily complicated.

Pros:

The beacon did everything well for everyone: the pro liked how it handled multiples, and its reliable long-distance "steering"; Tester C liked the floating arrow and superior audio pinpointing, and the analytical professor chose it based on its total package of range, pinpointing and multiples.

Cons:

Mode switch and price.

{mospagebreak title="Ortovox d3"}

Ortovox d3

\$315

Search-strip Width: 30 meters

ortovox.com

The digital, three antenna d3 features a multiple-signal indicator, but no masking or marking function. It displays direction and distance with an LED display. The d3 is not software upgradable.

Range:

Average range of the d3 was 32 meters, and the average of the lowest 10% was 15.6 meters, placing the d3 slightly ahead of the Tracker DTS.

Secondary Search:

One tester wanted to see more directional indicators than three LEDs, but the eight-year-old countered that the system is simple and easy to understand. "I like the three arrows: they're simpler; they don't jump too much, and stayed on when I was going in the right direction." The professor noted that the distance display response was fast and smooth.

Pinpointing:

All testers felt the d3's pinpoint performance was good. Tester C liked the "Geiger counter" impression of the audio feedback during pinpointing, and felt it sped her searches. The eight-year-old, too, liked the audio. When combined with the simple direction arrows, it made the d3 her second favorite beacon to the Pulse.

Multiples:

The multiple-indicator light lit consistently when two or more signals were present and flashed when two or more beacons are within about 10 meters. Without a masking function, testers needed to use the Three Circle Method to find

multiple beacons, but the d3 locked onto the strongest signal most of the time, which helped significantly.

Ergonomics:

Securing the harness powers on the beacon, a design favored by the absent-minded professor since he once completed a tour only to find out his beacon had been turned off the whole time. The green LED arrows are very bright, which is an advantage in sunlight, but annoying in darker conditions.

Pros:

The d3 has a solid and simple design, adequate range, smooth pinpointing, helpful audio, and the price is reasonable.

Cons:

With only a multiple-indicator light, the d3 has no counting or masking/marking capabilities for multiples.

{mospagebreak title="Ortovox S1"}
Ortovox S1

\$530

Search-strip Width: 50 meters

ortovox.com

The S1's flip-up LCD display automatically sorts multiple burials, displays approximate relative locations of victims, and has an effective multiple-marking feature. For 2010, software version 2.1 refines and improves self-testing and the beacon's ability to manage and pinpoint older (defective) beacons that have drifted out of transmitting frequency standards. Select retailers can update the S1, or Ortovox USA will do it for the cost of shipping.

Range:

The S1 showed a long average range of 37 meters, but the average of the lowest 10% was 22 meters, a bit below the other long-range beacons. Unlike other beacons, however, which might detect (then lose) a weak signal at long range, when the S1 locks on, it won't let go.

Secondary Search:

At long range, all testers felt the directional arrow shifted too much, and the novice eight-year-old (who favored the simplicity of the d3) liked this display the least. At mid-range, however, the directional indicator smoothed out, and the displayed distance readings were the most accurate of any beacon tested. The perspective display of the buried victim provides valuable visual feedback of the victim location, and the S1 effectively shows when you are pointing away from the victim by moving the victim below the crosshair, instead of having to wait for increasing distance numbers to clue you in.

Pinpointing:

At three meters, the display switches to pinpoint. A circle with four "concentric" arrows shrinks as you get closer to the victim, and the distance is displayed in the middle of the circle. This graphic split the testers: the pro said, "makes sense to me," and the Tester C found it "intuitive." Other testers didn't prefer this presentation of the information, and complained that the numbers were too small.

Multiples:

The unique ability to see the relative location and approximate distance of multiple victims plotted on its LCD display separates the S1 from all other beacons and helps provide an overall sense of the avalanche scene. Does it work perfectly? No. Is it helpful? Almost always. Multiples were found quickly, but the testers felt more familiarity would help even more. The avy pro added, "There's a lot of potential there...it could become my top choice." With its effective marking, it handled the difficult three-beacons-within-three-meters multiple scenario well, locking solidly onto the middle beacon, marking it, pinpointing the next closest, marking it, and finishing with the last.

Ergonomics:

As with other features of the S1, the clamshell design polarized testers. Some thought it was cumbersome, but the professor liked that it eliminates the need to check the position of a switch to confirm mode. The harness is simple and comfortable.

Pros:

A complete package: long range, diagramming of multiple burials, effective marking, and smooth pinpointing.

Cons:

There can be an overwhelming amount of rapidly changing info displayed for multiples, and at \$500, it's the highest priced beacon.

{mospagebreak title="Pieps DSP"}

Pieps DSP

\$450

Search-strip Width: 50 meters

pieps.com

The DSP displays distance and direction on an LCD screen, shows the number of multiple victims up to "3+", and automatically adjusts to the signals of other transmitting beacons to increase signal separation for a receiving beacon. The DSP can also measure the transmit frequency of other beacons to show just how far their frequency has drifted. Older DSPs can be upgraded at retail shops or by Liberty Mountain, the US distributor of Pieps, for a fee of \$20.

Range:

The range for the DSP averaged 38 meters, and the average of the lowest 10% was a strong 26 meters. In fact, only two samples were below 29 meters, strongly supporting a 50-meter search-strip width.

Secondary Search:

With long range, a secondary search starts early. Both direction and distance were stable, and tester comments summarized the secondary search as "smooth," "accurate," "fast," and "straightforward."

Pinpointing:

Directional arrows disappeared at two meters, but the distance display smoothly decreased as testers closed in on a burial, or increased as they pinpointed past the transmitter. One tester felt he could pinpoint more accurately and quickly with the DSP than with any other beacon.

Multiples:

At long range, the distance display is shaky with multiples, but the DSP quickly displayed the correct number of victims. The marking function performed flawlessly in all cases but one, where the receiver was a meter above two transmitters only 1.5 meters apart. One tester, however, who uses the DSP as his personal beacon, commented that the latest software does a noticeably better job of marking than did earlier versions. For additional assistance, a "scan" function tells the searcher how many beacons are within five, 20, and 50 meters of the DSP.

Ergonomics:

The distance numbers and direction indicator are easy to read and interpret, and the harness is beefy and supportive, but a little bulky.

Pros:

The DSP was a tester favorite due to its long range, consistent directional arrows, excellent management and marking of multiple burials, and smooth, precise pinpoint action.

Cons:

The pinpoint audio isn't as helpful as some, and at \$450, it's in the same (high) price range as the S1 and Pulse.

{mospagebreak title="TESTER BIOS"}
TESTER BIOS

Tester A: Avalanche professional who's been instructing courses for pros and novices for over 20 years. Personal beacon: Tracker DTS.

Tester B: Backcountry skier and university computer-science professor who solves multidimensional optimization problems in his head faster than you can balance your checkbook. Personal beacon: Pieps DSP.

Tester C: Backcountry skier and beacon user for 18 years who learned with "old school" analog beacons like Ortovox's F2, F1, and M1. Personal beacon: Pieps DSP.

Tester D: Eight-year-old child with no prior exposure to beacons. Notably, she quickly and successfully located single burials with every beacon tested. This speaks volumes about the intuitive nature of this latest generation of transceivers. (Not tested on multiples.)

Tester E: Backcountry's technical editor, Lance Riek, who has tested beacons and taught avalanche field classes for 10 years. Personal beacon: Pieps DSP.