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Avalanche Technology

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Staying alive in avalanche country requires more than owning an avalanche transceiver and knowing how to use it. It also involves awareness (avalanche education and forecasting), avoidance (safe travel techniques), surviving the physical trauma (terrain selection, wearing a helmet), preventing the burial (air bags), preventing asphyxiation (Avalung), locating the victim (searching and probing), accessing the victim, and medical care and transportation.

Avalanche transceivers are a key survival tool, and the technology in these tools has advanced radically in the last ten years. The revolution began with the fully-digital Tracker in 1997, with a digital display of the distance and intuitive blinking lights which direct you to the buried victim. In 2003 the Pieps DSP arrived to rave reviews, with a significantly longer reception range, a third antenna to more accurately locate victims in deeper burials, and the ability to ignore a signal when multiple victims are buried. The Pulse Barryvox continued the ongoing evolution with its ability to quickly toggle between analog and digital modes, and to triage multiple patients from the surface based on signs of life. And the Ortovox S1, released in 2007, introduced a unique display and user interface.

Functional Features

For the last five years, I've been following this technological advance, testing the latest gear, and publishing the results on BeaconReviews.com. My tests have ranged from measuring the distance that transceivers can accurately receive a signal, to chilling 50 transceivers to -18 C and using an oscilloscope to determine how the ambient temperature affects the transmission frequency, to subjectively comparing the user interfaces and the comfort of the harnesses. Based on my testing, here are four of the strongest contenders.

BCA Tracker

The Tracker was the first all-digital transceiver. It broke new ground with its arc of LEDs that quickly point you toward the buried victim. The Tracker justifiably earned top-honors for its ease of use—usability that has been met or exceeded by several of the new contenders. The reception range of the Tracker is shorter than the other digitals, with a suggested search strip width of 20 meters versus 50 meters. But although range is important, you can easily adjust for the narrower range by making narrower search strips. The Tracker has the lowest price of the digitals.

Pieps DSP

The Pieps DSP was the next all-digital beacon. With its single Off/Send/Search switch, I think it surpasses the Tracker in ease-of-use. And although the DSP's direction arrow isn't quite as snappy as the Tracker's LEDs, it has a noticeably longer range and the ability to ignore a transceiver when multiple victims are buried. The use of electronics to sort out multiple victims is a handy feature that is found in the newer digitals, although knowing how to search for multiple victims using manual search techniques, like expanding circles, is a worthy skill. The DSP was the first transceiver to allow software updates, and Pieps has been diligent in releasing upgrades—and slowing the obsolescence of your electronics.

photo by George Hetzner

Ortovox S1

The Ortovox S1 takes a much different approach than its rivals, by displaying the victims' location on a topographic-like map rather than pointing toward the nearest victim with an arrow or an arc of lights. Even the physical configuration is unique, with a clamshell design similar to a cell phone. The S1's user interface is more analogous to a Palm-computer than to existing avalanche transceivers, and its icon-only interface provides access to a slew of options and features including an inclinometer, an altimeter, and a compass. Whether you'll find the interface helpful or a hindrance during an emergency is a matter of personal preference. The S1 is the most expensive of the digitals.

Pulse Barryvox

As with the S1, the Pulse Barryvox has a built in compass that senses your movement and quickly points the Pulse's LCD arrow toward the victim. If you are walking away from the victim, both the Pulse and the S1 can point behind you, whereas the increasing distance numbers will be your clue to turn around when using the Tracker and Pieps DSP. The Pulse has several configuration options, but they are fairly well hidden to keep them from getting in your way.

Like the DSP and the S1, the Pulse has a long reception range. And you can extend the search range of both the S1 and the Pulse by switching into an old-school analog mode, although this will require you to use old-school search techniques to determine which direction to head.

The Pulse contains an extremely sensitive motion sensor, which will electronically transmit the existence of any movement, even arterial pulses sensed while the transceiver is in your thigh pocket, to your searching companion—if they are also using Pulse transceivers. Hence the product name, Pulse. It's a nifty feature if you have a fleet of Pulse transceivers, but even without this extra bell and whistle, the Pulse is a magnificent transceiver.

Personal Preferences

Selecting the right beacon ultimately comes down to personal preferences. If you want a capable digital transceiver at a low price, and will remember to make narrower search strips, the Tracker is an excellent choice. If you want an extremely easy to use beacon with a long search range, the Pieps DSP is superb. If you like the Ortovox S1's icon-based user interface, it contains almost every feature and option. And if you want a powerful digital transceiver with the option of quickly toggling to an analog mode, a responsive directional indicator, and a good user interface, the Pulse Barryvox is fabulous.

One Arrow in your Quiver

These ingenious products can certainly help you or your partner survive an avalanche burial, but remember that your transceiver is a tool that is used after calamity has struck; the best way is survive is to avoid being buried in the first place.

Steve Acheli is the publisher of the BeaconReviews.com website. He also publishes EMS software for handheld computers (eMedic.com), rope rescue software (RescueRigger.com), an online EMS quiz (SmartMedic.com), and an online wilderness medicine quiz (WM1quiz.com). Steve teaches WFR classes for Wilderness Medicine Institute and can be reached at Steve@RescueRigger.com.