

Battery life in Avalanche Transceivers

By Felix Camire, ACMG Assistant Ski Guide, January 2008

Why this test?

I always wanted to know when I should change the batteries in my digital transceiver (I use a Tracker DTS). I have heard of people changing at 80%, others at 40% and myself at around 60%. I basically wanted to know how long I could search with my transceiver if I had 60% (or 80%, or 40%) battery power left.

How and which transceivers?

I wanted to test as many newer digital transceivers as possible and compare them to two others that had been on the market for a while. I borrowed from Vertical Addiction (a ski/climbing shop in Canmore) a new Barryvox Pulse, a new Pieps DSP (ver 5.0) and a new Ortovox S1. I already had a new Tracker DTS and a 2 year-old Barryvox Opto 3000 (I did not spend the time and/or the money to try to get a new one since they are not being sold anymore).

This test was conducted with all transceivers on receive/search. The programmable transceivers in this test were left in their default modes apart from disabling the auto-revert function (that would switch the transceiver back to transmit after a preset amount of time).

The transceivers were checked about every hour to ensure that no error was appearing on the screen and that they were still all in receive/search mode. The percentage of battery power was also checked and recorded.

All transceivers were a measured 2m distance away from the transmitter. The temperature was 6°C (43°F) throughout the test. All batteries were brand new AAA Duracell Coppertop.

Test Results

Basically the more antennas and the bigger the screen the transceiver has, the more power you need from your batteries.

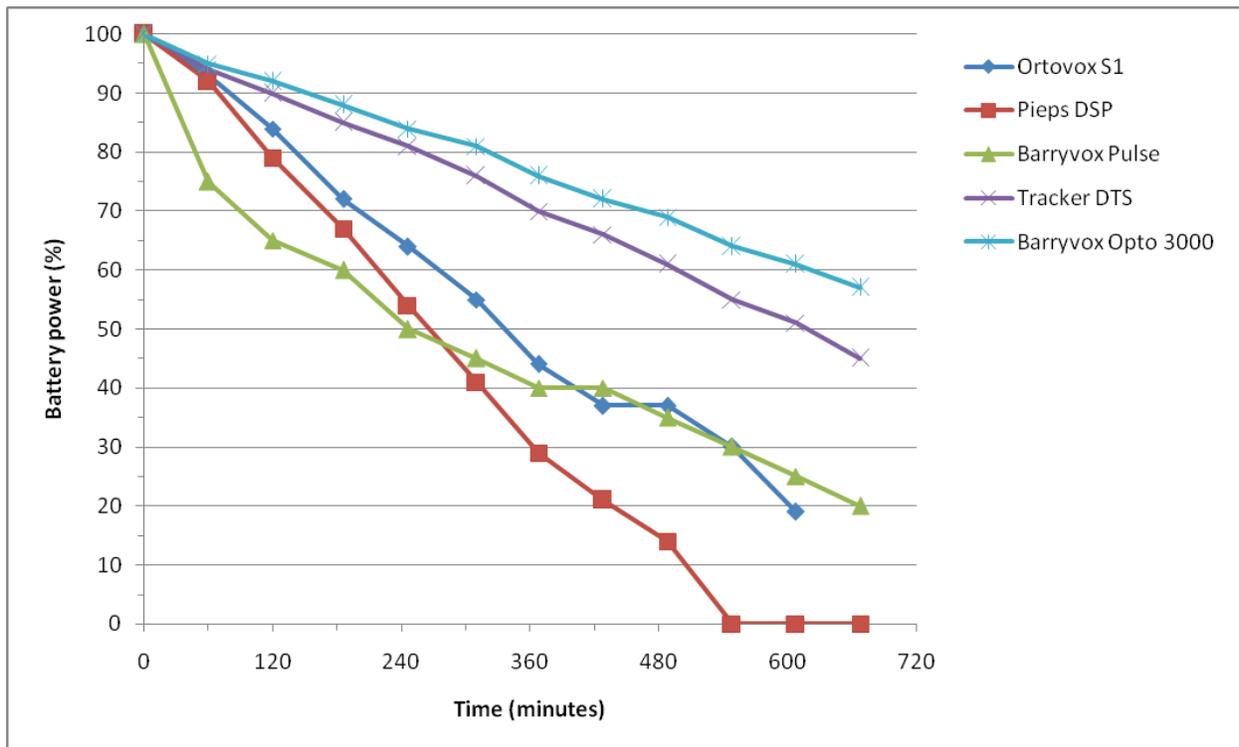
After 688 minutes (11.5 hours) of searching the transceivers had the following amount of power left:

- Barryvox Opto 3000 57%
- Tracker DTS 45%
- Barryvox Pulse 20%
- Pieps DSP (ver 5.0) 0% *
- Ortovox S1 0% *

*Of note:

- The Pieps DSP was showing 0% for a while (after 9 hours of search) but was still working and showing the same distance from the transmitter.
- The Ortovox S1 switched to Analog search mode on its own after 7.5 hours of searching (37% batteries) and stayed in analog search mode until after showing 19% and not working anymore (after 10 hours of searching).

Why is the Pieps DSP still working even if showing 0%? Some manufacturers have built into their transceivers a “buffer” for battery power. So the transceiver shows you 0% but you can still use it in a search. But obviously not every manufacturer does this!



From this test we can also predict how long the transceivers could search (down to 1% power left, as indicated during the self-test) with new batteries in warm temperature (6°C):

- Barryvox Opto 3000 ≈ 26 hours

- Tracker DTS ≈ 20.5 hours
- Barryvox Pulse ≈ 13.5 hours
- Ortovox S1 ≈ 10 hours (after auto-switch to analog at 7.5 hours)
- Pieps DSP (ver 5.0) ≈ 9 hours (when you get 0% on screen)
- Ortovox S1 ≈ 7.5 hours (fully digital)

What about colder temperature?

Another test was conducted to verify the effect of temperature on battery power. The same Tracker DTS was tested again with new Duracell batteries and the 2m distance. This time the temperature was between -12°C (10°F) and -10°C (14°F). This test was run for a bit more than 7 hours and it showed 46% left. So based on this you could potentially search for about 13 hours. This is a significant reduction in search time of about 37%.

Unfortunately I could not do the test with all transceivers in colder temperature. I did not want to keep \$1500 worth of transceivers away from Vertical Addiction and the batteries are quite expensive!

This is how long the transceivers could search with new batteries in colder temperature (-10°C), based on the 37% reduction as calculated with the Tracker:

- Barryvox Opto 3000 ≈ 16.5 hours
- Tracker DTS ≈ 13 hours
- Barryvox Pulse ≈ 8.5 hours
- Ortovox S1 ≈ 6.5 hours (after auto-switch to analog at 5 hours)
- Pieps DSP (ver 5.0) ≈ 5.5 hours (when you get 0% on screen)
- Ortovox S1 ≈ 5 hours (fully digital)

So how long of a search can you do?

Here are two tables showing how long of a search you can do based on battery percentage left.

This table is based on a temperature of 6°C

%	Ortovox S1	Pieps DSP	Barryvox Pulse	Tracker DTS	Barryvox Opto 3000
100	10 hours	9 hours	13.5 hours	20.5 hours	26 hours
80	8 hours	7 hours	10.5 hours	16.5 hours	21 hours
60	5.5 hours	5.25 hours	8 hours	12 hours	15.5 hours
40	3 hours	3.5 hours	5 hours	8 hours	10.5 hours
20	37 min	1.5 hours	2.5 hours	4 hours	5 hours

This table is based on a temperature of -10°C

%	Ortovox S1	Pieps DSP	Barryvox Pulse	Tracker DTS	Barryvox Opto 3000
100	6.5 hours	5.5 hours	8.5 hours	13 hours	16.5 hours
80	5 hours	4.5 hours	7 hours	10.5 hours	13 hours
60	3.5 hours	3 hours	5 hours	8 hours	10 hours
40	2 hours	2 hours	3 hours	5 hours	6.5 hours
20	23 min	1 hour	1.5 hours	2.5 hours	3 hours

Conclusion

I will not tell you or even propose at what percentage you should switch your batteries. However with the above graph, tables and results you can figure out for yourself when to change your batteries. Something to keep in mind is that I do NOT know how accurate the transceivers are in search mode with low batteries (I did not do a range check with every transceiver in low batteries condition due to time constraint with borrowed transceivers). And lastly the temperature has a huge effect on battery power.

Last note on batteries

Most transceiver manufacturers recommend the following:

- Using only high-quality AAA Alkaline batteries
- Change all three batteries at the same time and use same type of batteries
- Do NOT use rechargeable batteries, NiMH, NiOx, Li-Ion or anything with a bizarre acronym (stuff like Ultra Digital, PowerPix, Lithium or e² Titanium power, etc)

What to do with your “old” batteries? Since they are not completely dead you can use them in your headlamp, your MP3 player (or a Discman, if you still have one), your digital camera or any other device where your life does not depend on batteries. When they are dead please do not throw them in the garbage (this will cause ground pollution). You should recycle them at your local recycling station or pile them up and bring them to MEC next time you go there.