

Companion Rescue and Avalanche Transceivers: The U.S. Experience

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Time is the enemy of the buried avalanche victim, and the transceiver is the only tool that can be used to find the victim quickly enough to save a life. The purpose of this simple retrospective study was to examine the affect of the transceiver on the fatality rate of buried victims found by their companions in the U.S. from 1977 to 1998. Also, reviewed was the effectiveness of long-range units (457 kHz) versus short-range units (2.275 kHz) and mid-range units. (This was only a review of the effectiveness of range, not frequencies.) Lastly , the survival rates with transceivers were compared to other rescue methods. In conclusion several suggestions are offered to improve the survival rate of buried victims.

The data set (n=60) consist of only incidents where the buried victims were rescued by their companions and where the depth and time of burial were also known. Victims found by organized rescue teams were not included, except in two incidents where ski patrollers found victims ("customers") within or immediately adjacent to the ski area. Victims found by organized rescue teams using transceivers were not included since "rescue" often took place the next day and the mortality rate was 100%.

The companion rescues were segregated into two classes: professionals (ski patrollers, ski guides, snow rangers, etc.) and recreationalists (backcountry skiers/snowboarders, snowmobilers, climbers, etc.). Professionals are those paid to work on snow and in avalanche terrain, and recreationalists are those who play in avalanche terrain. It is assumed professionals practice more often with transceivers than recreationalists, and the results show the importance of their practice.

Survival rates

Professionals are faster with transceivers, and therefore more likely to find the victim alive (59%) than recreationalists (32%). Though a survival rate of only 59% may not sound encouraging, the buried victim found by professionals is almost twice as likely (84%) to be found alive than the victim found by recreationalists. Professionals are 77% faster finding their companion than recreationalists. The survival/mortality statistics of the US recreationalists are almost identical to the statistics of transceiver use in Switzerland. Reviewing 328 cases of recreational companion rescues found the median burial time to be 35 minutes and the mortality rate was 66.2% (Brugger, et. al., 1997)

	dead	alive	mean burial depth (ft.)	standard deviation (ft.)	mean burial time (min.)	standard deviation (min.)
professionals	13	19	3.7	1.81	18.3	14.7
recreationalists	19	9	4.2	2.09	32.3	23.2

Table 1. Comparison of companion rescue for professionals and recreationalists (Burial time is measured from the time of the accident to when the victim is uncovered.)

Range

The same data set was also reviewed for the type of transceiver used to determine if transceiver range has improved rescue. It has been suggested that high-frequency transceivers should increase the success of companion rescue due to the units' longer range (Meier, 1986). This limited sample (Table 2) shows longer-ranged transceivers have not increased the success of

companion rescue. This is in line with results from several studies (Dozier, et. al., 1989, Seaton, 1998). Dozier et al., “demonstrated no statistical difference between total search times for a 73m unit (Barryvox) and a 29m unit (Skadi). Seaton demonstrated search times with a shorter-range unit can be faster than with longer-range units.

	dead	alive
professionals		
short range (2.275 kHz)	8	13
mid range (2.275 /457kHz)	0	1
long range (457 kHz)	1	3
unknown	4	2
recreationalists		
short range (2.275 kHz)	7	4
mid range (2.275 /457kHz)	4	0
long range (457 kHz)	5	2
unknown	3	3
combined		
short range (2.275 kHz)	15	17
mid range (2.275 /457kHz)	4	1
long range (457 kHz)	6	5
unknown	7	5

Table 2. Comparison of transceiver range used in companion rescues.

Transceiver range does not affect the outcome of companion rescue. Table 2 shows professionals save more lives than recreationalists regardless of the transceiver’s range. Though the data shows great success for professionals with long-range units, the sample (4 cases) is too small to support the conclusion. The data infers it is significantly more important to be well practiced than have a transceiver with a long range. Long ranges help rescue teams search large areas more quickly, but for recreational users long range units can even prolong the search. Experience shows novice users take longer to conduct a transceiver search when they receive the signal at great distances.

Comparison with other rescue methods

Conventional wisdom maintains transceivers should be the best rescue method to find victims alive. However, this is only true in the case of the professionals. Table 3 shows (discouragingly) that transceivers in the hands of recreationalists are even less effective than spot probing, a method where success is based more upon luck than skill. Even more troubling is the survival rate for all completely buried victims is only 29% (Logan and Atkins, 1996).

rescue method	victims found alive
transceivers (professionals)	58%
spot probe	42%
transceivers (recreationalists)	32%
coarse and fine probe	15%

Table 3. Victims found alive by different rescue methods.

Conclusions

Professionals are significantly faster and save more lives with transceivers than recreationalists. The professionals' success comes from significant practice, however, incident reports tell even the professionals have problems using transceivers. Recreationalists will likely never practice as much as professionals, and there are far more recreationalists using transceivers than professionals. Thus the survival rate of buried recreationalists cannot be expected to improve until several things happen. One suggestion is avalanche educators must reinforce the principle of practice, practice, practice with transceivers and encourage students to choose their friends wisely. Few recreationalists can use transceivers fast enough to save a life. In general terms, survival of recreationalists equipped with transceivers is no better than that of all completely buried victims. Practice is the best way to improve the chances of survival.

Another suggestion to improve the survival rates for buried victims, besides practice, is to encourage new transceiver technologies that improve the ease-of-use. It is ironic the transceiver—a simple electronic instrument—is so difficult to use without significant amounts of practice. In their recent study of avalanche rescues in Europe, Brugger, Falk, Buser and Tschirky (1997) concluded, "Further technical developments of the transceiver is mandatory to increase the proportion of saved persons during the first 15 minutes after the avalanche, and hence to significantly lower the death rate." Time is the enemy of the buried victim and "easy-to-use" transceivers that result in faster search times and encourage practice are necessary to save significantly more lives, especially for the recreationalists. New transceivers by Back Country Access, Orotovox and Option are significant improvements from older units.

The last suggestion is one of consumerism. To help recreationalists and professionals choose transceivers future comparison tests should focus on ease-of-use and search times. Reporting maximum ranges is a red herring and can mislead consumers. Increased range does not improve success. It is more important transceivers meet and/or exceed a determined minimum range (20 meters) than some maximum range.

Companion rescue saves the most lives of buried victims. While luck is a significant factor in avalanche rescue, improving transceiver skills and technology can increase the survival rate of buried victims.

References

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