BUILDING AN INEXPENSIVE BEACON BASIN

Devin S Hiemstra
Mt Rose Ski Patrol, Reno, Nevada, USA

ABSTRACT: Beacon Basins are a great way to practice rescue techniques and educate the public but many organizations are unable to afford the price tag for a commercial option. We came up with a way to put in a practice area using existing transceivers and keep the price tag under 300 US dollars.

We built a hub and spoke pattern using 4-inch pipe. Inside the pipes, transceivers can be placed under pre placed strike plates. The pipes are buried at different depths and can be up to 20 feet long to make complex problems with one person at the hub able to move transceivers into position. This is a great way for organized groups to practice fine search skills for both avalanche transceivers and RECCO reflectors. The basin also creates a central space for public education and awareness.

KEYWORDS: Training, Practice, Rescue, Transceiver, RECCO

1. INTRODUCTION

Like many resorts and educational organizations, every year we say we want to put in a beacon basin. The benefits of a conveniently located and easy to use basin for in house training and public outreach are numerous. Yet, every year the basin proposal seems to get lost in the jumble of a complicated and crowded snow safety budget. In the end, many other things taking precedent over spending the money on one of many commercially available training set ups.

After all, we seem to get by just fine putting out one or two transceiver boxes at a time and marking a path for patrollers to run through. This current method even has additional benefits of providing a larger, full, problem in unique locations. However, we still wanted to find a solution that would allow us to work on fine searches and complicated multiple burials while keeping patrollers available at the top of the mountain. We also wanted to make a training area that would be accessible to the public.

Last season we tried to achieve the best of both worlds, or at least find a solution that was good enough for both worlds. We came up with a design using existing transceivers and irrigation tubes from a local hardware store to build a basin that required minimal day-to-day maintenance and allows us to set multiple problems quickly and easily. It is located next to the patrol shack at the top of the mountain to make it easily accessible to patrollers and public alike.

2. DESIGN AND MATERIALS

The Basin is designed in a hub and spoke pattern so that an operator can use one central access point for all tubes. Since the tubes are buried under the snow they can be placed at different heights and any number can be used.

Fig. 1: Top down look at the hub and spoke pattern, with fixed strike plates on each tube.

Fig. 2: The hub has bamboo marking and a cover to minimize digging.
2.1 HUB LAYOUT

Fig. 3: The spoke tubes are easily accessible once the hub is uncovered.

Since we are dealing with snow, the center of basin is just a hole that the operator can stand in to access all of the tubes. We designed ours so that seven tubes fanned out from the center at different heights in the snowpack (figure 3).

With the number and length of the tubes used we created a practice area approximately 40 feet by 20 feet (since ours is on a slight slope and we didn’t put any spokes downhill of the hub).

2.2 SPOKES

Fig. 4: Cross section of a portion of tube. Since the knot can’t pass through the pulley, the cord loop is pulled counter clockwise to remove the transceiver and clockwise to set it in place.

To make the spokes we used 4” x 10’ plastic irrigation pipes. The pipes can be combined to create longer tubes. Each tube is assembled as a self-contained unit and can be moved independently. The tubes have a fixed cap at the far end with a pulley and cord; this lets us move the transceivers into place. The cord is tied into a loop with a sizable knot that cannot pass through the pulley. The cords then have attachments for the transceivers that correspond to strike plates attached to the tops of the tubes.

Each tube has between one and three plates already attached to it. The near end of the tube (the one in the hub area) has a removable cap that can be painted bright orange so it is easier to find.

2.3 OTHER MATERIALS

To build the strike boards we used pressure treated plywood cut to 30cm by 30cm squares. The boards are attached to the pipe using marine grade bungee so that no holes were drilled in the tubes.

Fig. 5: Transceivers are attached to the cord and pulled through the tube.

This setup was built using existing transceivers to keep the cost as low as possible. We used three Pieps DSPs with the grey harnesses (straps removed). The only significance of the transceivers used is that they slide easily through the tubes. We also added RECCO reflectors to the transceivers to give us an additional training option.

3. BENEFITS

- Having a beacon basin at the top of the mountain allows us to train while staying in service.
• The Beacon Basin provides a central location for public outreach and education.
• Low cost made it easy to get approval for project.
• Since each spoke is independent we can easily add, subtract, or move placements and depths within training area.
• Maintenance is relatively low. By keeping the Hub area dug out we can access many different placements and create endless unique problems.
• Easy to practice with avalanche transceivers and/or RECCO receiver.
• Can quickly reset problems to provide immediate feedback and reinforcement for students.

4. POTENTIAL PROBLEMS

• Easy for someone to access hub and steal transceivers.
• Commercial Basins usually have longer battery life.
• You still have to dig out hub and reset from the middle of the training area. Versus a remote system which lets you turn transceivers on and off.
• Could create a significant obstacle in skier areas.
• Potential for transceivers to get stuck in tubes due to ice or other unforeseen issues.

By placing the basin close to our patrol shack we are able to monitor the area and haven’t had any problems with theft. It is also out of the way of skier traffic. The battery life issue has not been a major problem since we can still access the transceivers form the hub and remove them when the batteries are too low. We also did not see any problems with ice formation or other obstructions inside the tubes.

5. FUTURE PLANS

Next season we are planning to work with local forecasting and education centers to make the space more visible and accessible to the public. We would like the public to use the space for practice and as a contact point for advisories and awareness. We are also looking at other locations around the mountain that could help achieve these goals.

We plan to continue using buried boxes to simulate full paths and larger areas and use this training area as an adjunct to work on specific skills.

When we first came up with the idea to build this training area we looked at fixing the pipes to the ground at different heights. This past season we didn’t have any issues with the tubes creeping or shifting in place and the current set up allows us to adjust the depth of individual tubes as the season progresses. We were also concerned that fixing the tubes to the ground would limit us to waiting for enough snow and then struggling when the snow depth increases. We are still working on a better solution for the hub set up and maintenance.

For more information or to share ideas contact Devin at: dhiemstr@gmail.com

CONFLICT OF INTEREST

This study was not supported financially or materially by any manufacturers of avalanche transceivers, beacon basins, RECCO or hardware stores. The author is not involved financially in the production or sale of above products nor has he received any related grants or patents.

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