



## Coast Guard Uses Pocket PC to Save Lives!

Few jobs are more results-defined than search and rescue, and few present the same harsh environmental challenges. When a call comes in, time is the most precious commodity of all. The quest to save time is born from life-and-death situations, and that quest is what drove the crew of the U.S. Coast Guard's Station Oregon Inlet to develop and implement an award-winning solution using GPS capabilities, sophisticated mapping software and a rugged Pocket PC.

Station Oregon Inlet (SOI) is located near Cape Hatteras, North Carolina. The small-boat rescue station covers the Cape Hatteras National Seashore, several sounds, and the general coastline extending up to the Virginia-North Carolina border. Their territory extends from shore to 50 miles out to sea. The SOI personnel also perform marine law enforcement duties, but their most vital assignment is rescues.



### Time is precious; conditions poor.

As you would imagine, searches rarely occur in optimal conditions. Between the typically bad weather and the emergency nature of the calls that come in, the search-and-rescue teams have to perform under challenging conditions and extreme time pressure. Until recently, the typical response would proceed like this:

1. A call would come in with last known position of a boat.
2. That information would be processed in the Coast Guard's computer system, producing a search pattern based on known position, weather conditions, currents, etc.
3. Since the computer is located at a remote station, the search pattern information was transmitted to SOI.
4. SOI in turn relayed the information to the outbound rescue boat.

This presented a dilemma: Hold the rescue boat until the pattern's waypoints are faxed to SOI and then literally run them out to the boat, or send the boat out in the general direction of the last known location and radio the information to the boat en route? The first choice wasted precious time, while radioing the data meant someone on the boat had to transcribe it by hand before applying it to the boat's navigational charts, which also took time and was prone to human error.

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Once the boat's crew had the information, the search effort began. Of the crew of four, one plotted the search pattern legs on the charts. Another used a stopwatch to time the legs. A third drove the boat. Only one could actually focus solely on scanning the rolling waters for the target.

"We were almost missing the point of the whole exercise," says Petty Officer Justin Schnute of SOI. "We were out there searching, but spending too much time looking at charts. Only one of the crew was actually looking for the target. And initial communication was very difficult and time-consuming. We needed one tool that could combine navigation and communication."

### **A better way to save lives!**

Schnute had the background to know that there must be a better way. A reservist who voluntarily went on full active duty the day after the Sept. 11 attacks, he has a degree in computer technology from Indiana University. He knew technology existed that could help, but the challenge was to make it fit the application's specific challenges.

He contacted Memory-Map, Inc., an independent software developer that produces detailed Pocket PC maps for both marine and land-based users, with his idea. Memory-Map in turn recommended SOI use the Trimble Recon, a handheld computer that runs Windows Mobile for Pocket PCs and is built rugged enough for extreme environments.

"We have a lot of clients using Pocket PC software in marine environments, but that's a harsh place," says Richard Stephens, president of Memory-Map. "You've got salt water, salt air, boats that can tip over—we wanted to create a package that was practical for that environment."

Schnute saw the same need. "We were using an HP iPAQ Pocket PC, but at a surf boat station, you're talking about 47-foot boats going into 30-foot waves. We tried out several rugged handhelds ourselves, but we selected the Recon. It's extremely rugged, it's lightweight, and it's relatively inexpensive. It's compatible with our satellite phones using the serial port, and we can put a GPS card into one of its CompactFlash slots."

So Memory-Map worked with Schnute to put together its software with the rugged Pocket PC to create an information and communication tool optimized for a marine environment. After several iterations and much experimentation, the partnership created a system that vastly improves on the stations' old search methods.

Now, with a rugged, GPS-equipped Pocket PC connected to a satellite phone, a rescue boat can leave for the search area as soon as the Coast Guard receives an alert. When the base station office has generated a search pattern map, it's e-mailed directly to the device on board the boat. The Pocket PC then displays the search pattern on its 240 x 320-pixel color screen.

"It's a double improvement," says Schnute. "Our crews don't have to wait for the map when a rescue call goes out, and that lets them reach the site sooner. And with three sets of eyes instead of just one looking for the target, we stand a better chance of finding the target quickly."

SOI Master Chief Steve Bielman, a 30-year veteran of Coast Guard search-and-rescue who worked in the days when searchers had only a compass and fathometer for navigation, has seen the benefits of the new system during recent searches.

"We save 20 to 30 minutes alone in prep time by not having to lay out charts to plot a course," he says. "And the Pocket PC displays the course with our boat's current position, so one person can navigate, with visual assurance that we're staying on course."

In addition, the flow of information is greatly enhanced by the new technology. “Now the information we’re working from is readily available, and it’s current,” says Schnute. “If we don’t find anything after we’ve executed our original search, the base can update with new weather info, create a new search pattern and e-mail it to us. In the past that process would involve radio, hand-written transfer, entering into GPS—a 15- or 20-minute process. Now it takes a couple clicks and a few seconds.”

The new system is groundbreaking enough to have recently won the Coast Guard’s Captain Niels P. Thomsen Innovation Award, established to recognize individual members or teams who find ways to improve Coast Guard practices.

At this point, each qualified coxswain at the station has a Pocket PC. As previously purchased non-rugged devices fail, they will be replaced by rugged Recons. SOI is being treated as a prototype station, tasked by the Coast Guard 5th District with perfecting the solution. After that, the plan is for the entire district to implement this search and rescue solution, and eventually all districts nationwide.

In the meantime, the personnel of Station Oregon Inlet—and those in danger that they help—are thankful for the new system. Says Master Chief Bielman, “This is an absolutely huge step. To be able to use a resource like this increases our efficiency tremendously. I have no doubt it will help us save lives.”

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