# Compassion in Action: Safeguarding Backyard Swimming Pools

Your backyard swimming pool can be a source of relaxation and delight—as long as you keep a lifeguard on duty 24/7. For the higher your fence and the more secure your gate latch, the greater the challenge to all the children who know that oasis is back there. And far too frequently, when everyone has come indoors for refreshment, a toddler wanders through the open gate and falls into the water. Everyone thought someone else was watching the child.

Accidental drownings and near-drownings are second only to traffic accidents in the toll they take on children's lives between the ages of 1 and 14. Here are some data:

- Nearly 800 children aged 14 and younger died from accidental drowning in 2003; another 3702 were treated in hospital emergency rooms for near-drowning injuries.
- Of those who survive near-drowning accidents, 20% will suffer severe, permanent neurological disabilities.
- Approximately 300 children aged four and younger drown in residential pools each year, more than half of them in the family pool.

## A Poolside Alert

Bob Hoenig, AquaSonus co-founder and chief technology architect, set out to design a pool intrusion alert system from the napkin-stage on up. Drawing on their experience in developing digital signal processing (DSP)-based products, predominantly with radar and sonar applications, Hoenig and colleague Bill Roberts first interviewed a number of pool owners to find out why previously existing safeguards had proved unsatisfactory. They discovered that water displacement technology-based devices were difficult to set up and issued too many false alarms.

Hoenig's solution was a pool alarm system consisting of two units: a poolside sensor and a remote monitor placed in the house. A hydrophone incorporated into the pool unit continuously listens to acoustic sounds in the water. Software analyzes the sounds and ascertains whether the disturbance is caused by pumps, pool toys, wind-driven waves, falling debris—or a child. Within two seconds of detecting a presence in the water, the AquaSonus activates red lights and 100 dB alarms both poolside and in the house.

## The Inspiration

According to Hoenig, "Instant notification of an accident is imperative for parents and caregivers. The rapid rescue of a child not only saves the child's life, but also reduces the likelihood of brain damage. The seriousness of this problem was the primary impetus in the development of a high-technology sensor and DSP-based solution. We are the first to incorporate an embedded computer, passive sonar, acoustic sensors, and low-power circuitry with wireless communications in a pool safety monitoring system."

In recognition of the extremely innovative technology represented by AquaSonus, and of the undeniable need for such a life-saving device, the editors of *Sensors* are pleased to present to Bob Hoenig the 2006 *Sensors* Humanitarian Award.

Bob Hoenig, AquaSonus co-founder, holds the in-pool unit that detects an unauthorized presence in the water and sounds an alarm.