GPS in Boating Accident Reconstruction at ATA

Over 40 years ago, in one of his first cases as an expert witness, Bob Swint, the founder and owner of ATA Associates, Inc., investigated the ejection of an occupant from a moving boat and the propeller strike injury that followed. Since that time, despite many improvements in pleasure boat technology, disturbingly similar accidents still regularly occur. Today, ATA's work in the reconstruction of ejections and other boating mishaps continues, aided by insights into boat design and performance gained from years of investigating scores of boating accidents across the United States.

As boating technology has improved, so too has the technology of boating accident reconstruction. Often, these improved technologies are one and the same. The global positioning system (GPS), which revolutionized boating navigation, has also transformed the documentation of boat movements. In boat collisions, if one or more of the boats involved is equipped with a functioning navigation system, GPS data downloaded from that system may provide definitive evidence on the particular circumstances of an accident. In occupant ejections, where forensic GPS data may be either unavailable or inconclusive, GPS technology can still be an invaluable tool to quantify the path and speed of a boat (either the actual boat or an exemplar) executing maneuvers staged later to replicate a likely accident scenario.

In ATA's most recently concluded boating case, analysis of test data from instruments aboard a state-of-the-art ski boat provided fresh insights into ejection dynamics. With GPS receivers providing time-stamped boat position data in a series of typical turns, three-axis accelerometer sets measuring the associated inertial loads, and pitch-roll-yaw sensors describing the boat's moment-to-moment orientation in the turns, analysis showed that the potential for occupant ejection occurs much earlier in a turn than might be expected. The forward-directed ejection paths indicated by the test data, although consistent with Newton's laws, were also surprising and sobering too; given that the boat's shallow bow seating provided only minimal occupant restraint. This is a feature that is, unfortunately, common to many of today's most stylish, expensive and presumably well-designed high performance boats.