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A Second Generation Self-Locating Datum Marker Buoy

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In 1990's the U.S. Coast Guard wanted to leverage advances in drifter technology to develop an Self-Locating Datum Marker Buoy that would accurately follow surface currents to focus search and rescue by better allocation of search and rescue assets through more accurate estimates of surface drift. Building upon the proven design of the Davis 1-meter surface drifter they sought improvements by adding GPS self-location and Argos satellite data transmission to allow automation of the collection of drifter track information. To reduce the size of the SLDMB a "seven-tenths" size reduction was specified which shrunk the vertical dimension of the drifter from 1 meter to 0.7 meters. To satisfy needs of storing and deploying from aircraft and ships the drifter needed to be configured to fold up into a cylindrical package system that would self-deploy no matter the launching platform.

The SLDMB has become a valuable tool in search and rescue operations at sea. However, limitations of that SLDMB have prompted the development of a second generation SLDMB that addresses drawbacks of the original design. The SLDMB and its launch container are bulky and take up valuable space in deploying vessels with confined quarters. The physical size and shape of the SLDMB is non-standard and requires specific deployment procedures and certifications for each type of deploying vessel. Latency inherent in Argos system satellite orbits can delay the relay of drift information for up to two hours. Working with C-Core the Canadian Coast Guard developed modifications to the SLDMB specification to address these shortcomings. The new configuration must be air-deployable from an A-size sonobuoy launcher; and if the physical characteristics can be made similar to A-size sonobuoys perhaps air certification will be possible by congruence. Reducing the size to an A-size configuration also places the SLDMB into a package about half the size of the current SLDMB.

The SLDMB must use the global Iridium system SBD data messaging to eliminate drifter data latency; SBD messages typically are delivered within minutes of transmission which are not limited by satellite visibility since Iridium satellites are continually visible. The position data from the SLDMB must be configured to provide frequent locations immediately after deployment then less frequent information as deployment time increases. Working from this refined set of specifications for the second generation SLDMB, we have solved the challenges of reducing the drifter physical size and achieved air deployment from an A-size sonobuoy tube with a novel deployment system that has been successfully demonstrated in trials at sea and air with nearly a 100% return of drift data on schedule by Iridium SBD.