SWIFT: Surface Wave Instrument Float with Tracking, v3

Hull	Anodized aluminum
Power	14 VDC, Alkaline or Lithium D cell packs
Weight	30 kg in air
Dimensions	1.25 m draft, 1.0 m mast, 0.35 m diameter
Shipping crate	1.65 m length, 0.5 m width, 0.5 m depth
Endurance	20 days (Alkaline), 60 days (Lithium)
Tracking (RF)	Garmin Astro DC40 or AIS
Tracking (Iridium)	Geoforce SmartOne (global)
Telemetry	Iridium SBD
Processor	Sutron Xpert
Profiler	2 MHz Nortek Aquadopp HR
Met	Airmar PB200 or RM Young 8100
IMU	Microstrain 3DM-GX3-35
CT	Aanderaa 4319
Camera	123 Camera Y201-TTL
Light	Yellow 1s strobe

SWIFT drifters were developed by Jim Thomson's group in the Applied Physics Lab at the University of Washington. The primary purpose of the drifter is to measure turbulence at the ocean surface in a wave-following reference frame. The turbulence measurements use up-looking pulse-coherent Doppler profilers. Secondary measurements include directional wave spectra, surface winds, salinity, water temperature, air temperature, and surface images. Capabilities include onboard processing, Iridium SBD data telemetry, and month-long endurance. An alternative version uses a down-looking Doppler profiler for estimates of mixing up to 20 m depth. An upgrade uses an RM Young 3-D sonic anemometer to estimate the turbulence wind stress.

Since 2009, SWIFTs have been deployed to study air-sea interaction, wave breaking, and surface mixing at locations worldwide, totally over 20,000 hours of data collection. SWIFTs have also been deployed to study wave-ice interactions in the Arctic and have been air-dropped by helicopters to study extreme wave conditions.

Drift deployments can last from a few hours up to one month. Drift speeds are approximately 5% of the surface winds, in the absence of currents. SWIFTs are tracked in real-time using a Garmin Astro radio collar or AIS beacon (continuous updates with 10 km range) and an Iridium positioning beacon (updates once per hour with global coverage).

The SWIFT drifter and associated methods are detailed in 2012 article in the Journal of Atmospheric and Oceanic Technology (vol. 29, p. 1866-1882). More information, and online data, are available at http://www.apl.uw.edu/swift .