

INSTALL BEFORE LIFTING

REPRINT

# SEA TECHNOLOGY

[www.sea-technology.com](http://www.sea-technology.com)

JULY 2022

**DECK GEAR  
CABLES / CONNECTORS  
POWER SYSTEMS & SALVAGE**

**FEATURING:**

**Innovative Compact Winch  
Penetrators vs. Connectors  
Water-Air Radio Modem**





# USV for Shallow Water, Open Ocean

## *SP-48 Deftly Maneuvers for Challenging USCG ATON Survey*

By Alessandra Bianchi

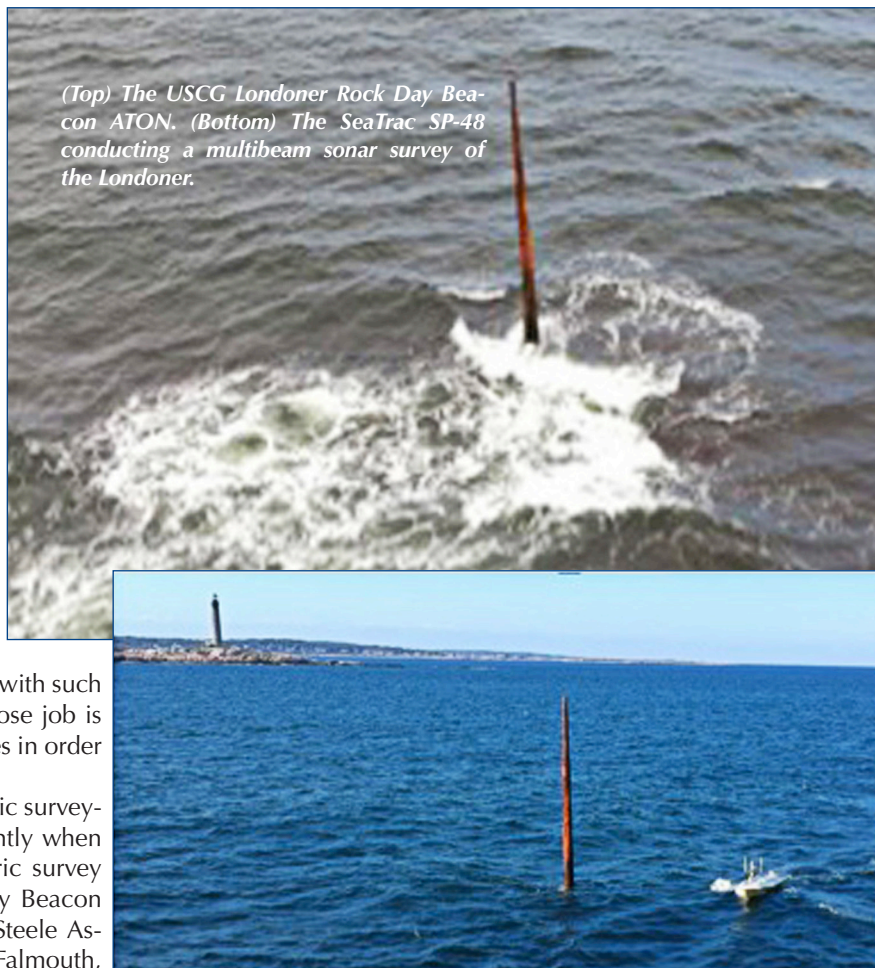
---

**A**ids to Navigation (ATON) come in many shapes, sizes, sounds and colors, featuring lights, sound signals, buoys, day beacons and/or other components. For instance, in the waters east of Rockport, Massachusetts, in notorious “Perfect Storm” territory, lies a rusty iron spindle protruding above the surface, like a pointy, angry nail from the seabed. Known as the Londoner Rock Day Beacon, the spiky structure is a U.S. Coast Guard (USCG) ATON, designed to be a mariner’s friend, despite looking like it might be a foe. The Londoner, perched atop an exposed rock pile in an otherwise open stretch of water, is like a double-edged sword: designed to aid mariners, yet hazardous in its own right if approached too closely.

The USCG is aware of such contradictions. Its 400-page compendium ATON “Light List” from the Atlantic Coast ([www.navcen.uscg.gov/pdf/lightlists/LightList\\_V1\\_2019.pdf](http://www.navcen.uscg.gov/pdf/lightlists/LightList_V1_2019.pdf)) cautions: “Vessels should not pass fixed aids to navigation close aboard due to the danger of collision with rip-rap or structure foundations, or with the obstruction or danger being marked.” Few mariners would argue with such terms. However, there are those whose job is to take a closer look at such structures in order to inspect them.

Such was the position hydrographic surveyor Eric Steele found himself in recently when tasked with performing a bathymetric survey of the damaged Londoner Rock Day Beacon for the Coast Guard. Steele’s firm, Steele Associates Marine Consultants LLC, in Falmouth,

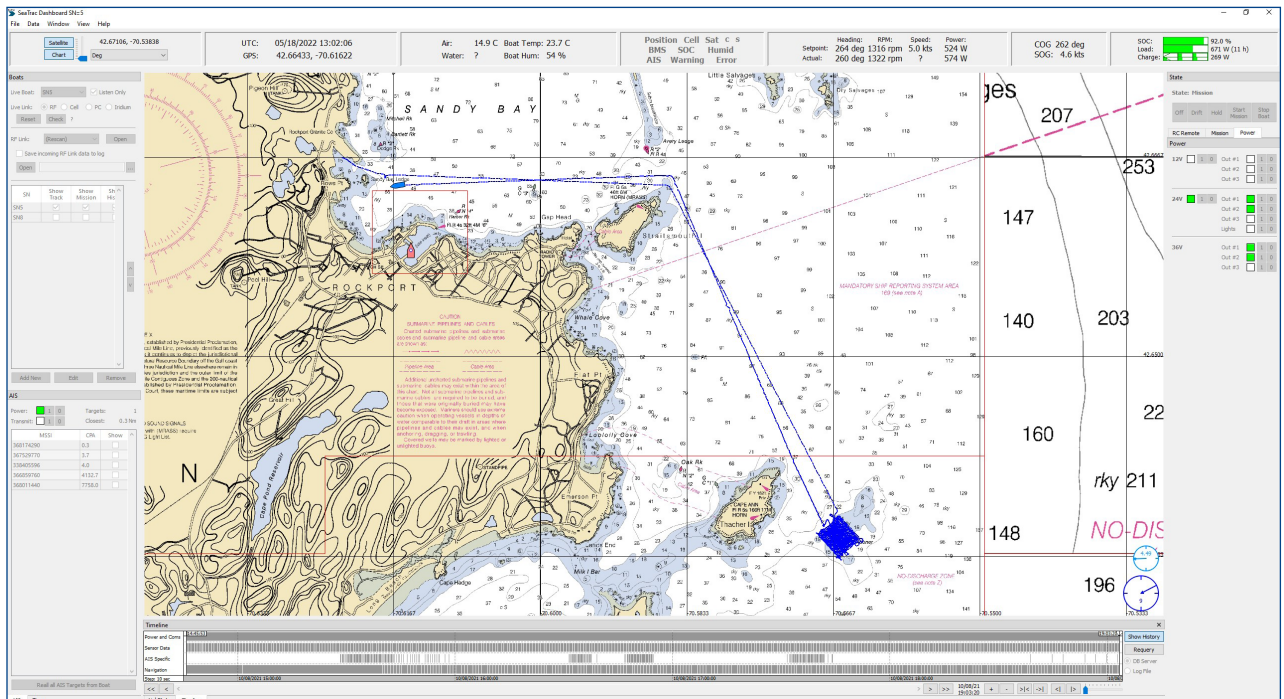
Massachusetts, regularly provides highly accurate hydrographic survey data and interpretation for U.S. Army Corps of Engineers, Navy and Coast Guard projects, so Steele, a certified hydrographer, knew what he was getting into.



*(Top) The USCG Londoner Rock Day Beacon ATON. (Bottom) The SeaTrac SP-48 conducting a multibeam sonar survey of the Londoner.*



(Left) The SeaTrac SP-48 USV can perform shallow-water surveys in open ocean. (Below) Survey route.



“Many of our surveys involve complex site conditions, requiring a nuanced survey approach while minimizing risk to field crews and survey assets,” Steele said. “The scope of the Londoner ATON job required high-resolution multibeam bathymetry of an exposed rock feature in otherwise open water. A hazard analysis determined this shallow-water, dynamic site posed a significant risk to the safety of the survey crew using a conventional survey vessel.”

Steele Associates had already added a small autonomous surface vessel (ASV) to its collection of in-house vessels for tricky shallow-survey jobs, but the ATON assignment was a bit of a hybrid: a shallow survey in the middle of open ocean.

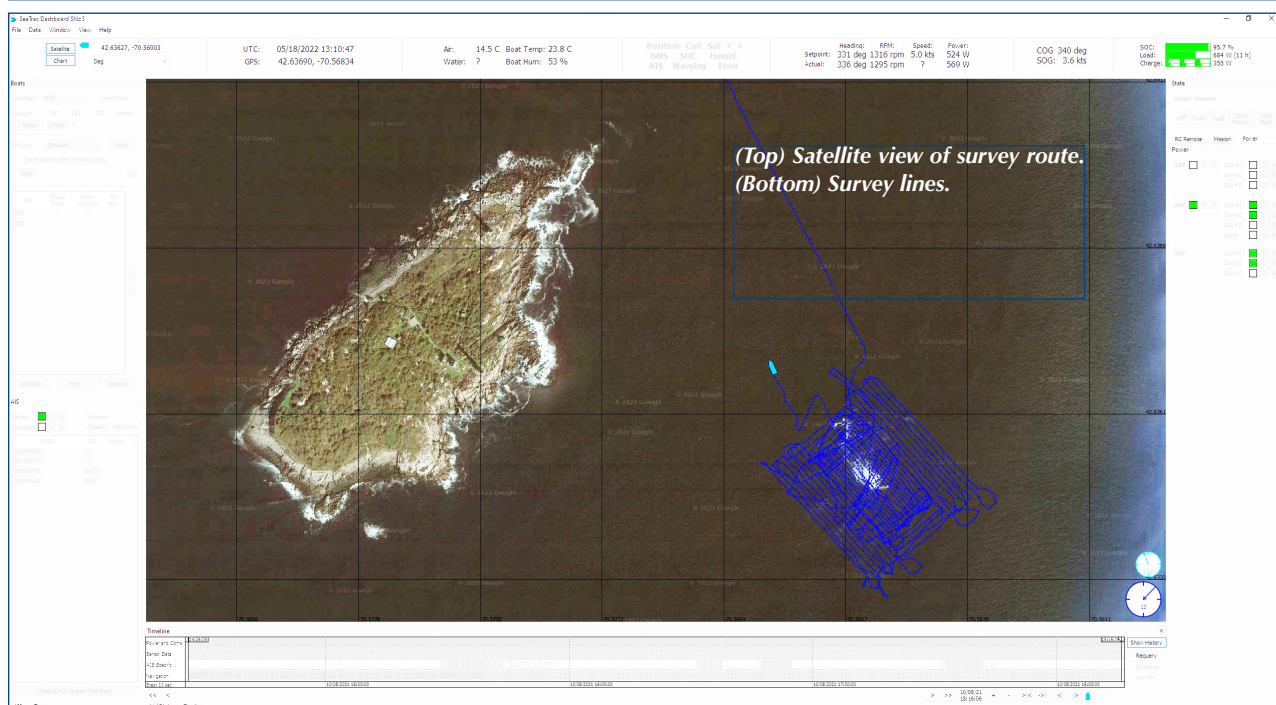
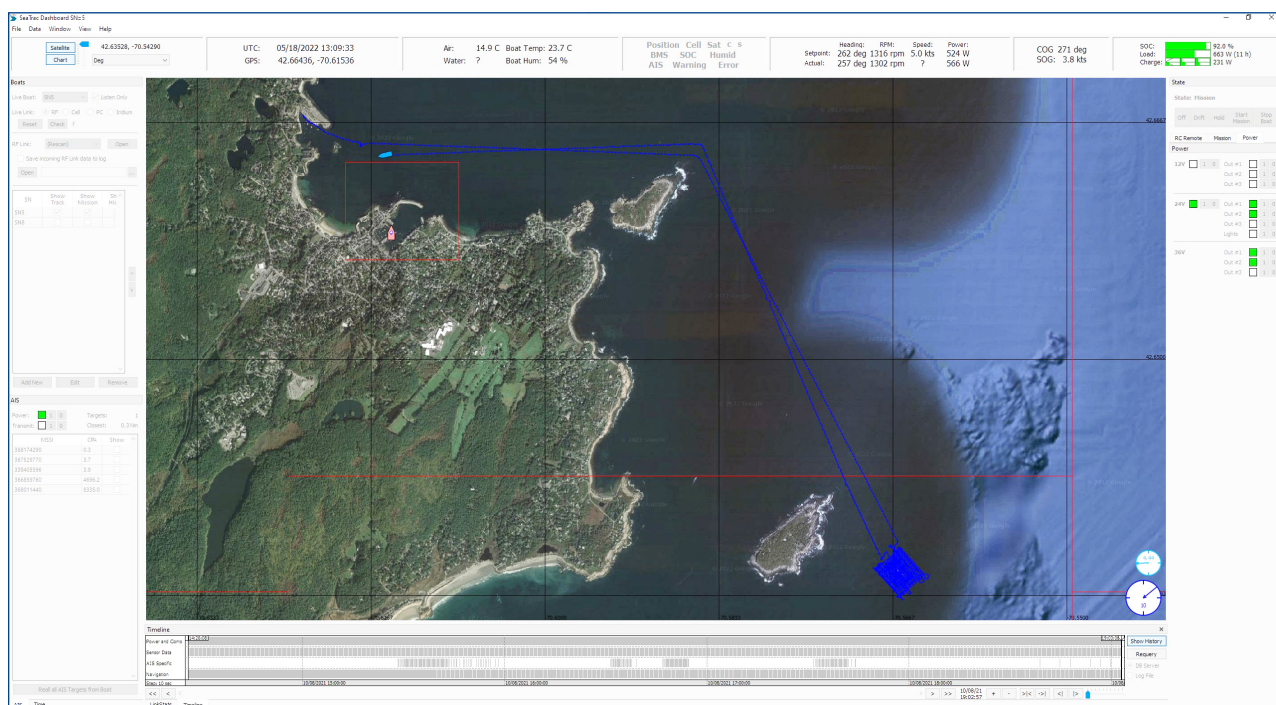
In contrast, Steele Associates’ six-footer was better suited for protected waters. The Londoner Rock ATON survey job would require a persistent surface vehicle that performed well in both shallow waters and open ocean—a perfect fit for SeaTrac Systems Inc.’s SP-48, a solar-powered, 4.8-m unmanned surface vessel (USV) featuring versatility.

## USV for Shallow Water and Open Ocean

SeaTrac’s SP-48s are among the newer entrants in the USV space, designed to be the utility player of the field. They are versatile, with the ability to operate in both open ocean and shallow areas, such as mudflats, rivers and near shore. They are persistent, thanks to 750 W of solar panels and large battery storage that can be tapped for reliable propulsion even when no solar energy is present. They are powerful, with 500 W of available payload power, thanks to onboard lithium-iron batteries and custom battery management software.

The SP-48 is sensor agnostic, with a moonpool, mast and hull for mounting best-in-class multibeam and side scan sonars, ADCPs, water quality sondes, hydrophone arrays, aquatic-habitat echosounders and various other oceanographic sensors. The platform is also flexible, with several modes of operation, i.e., manual, supervised and full over-the-horizon autonomy; communications options, i.e., line-of-sight radio frequency, cellular, high-bandwidth satellite or custom networks; and easy launch/recovery options, i.e., ramp, pier or ship.





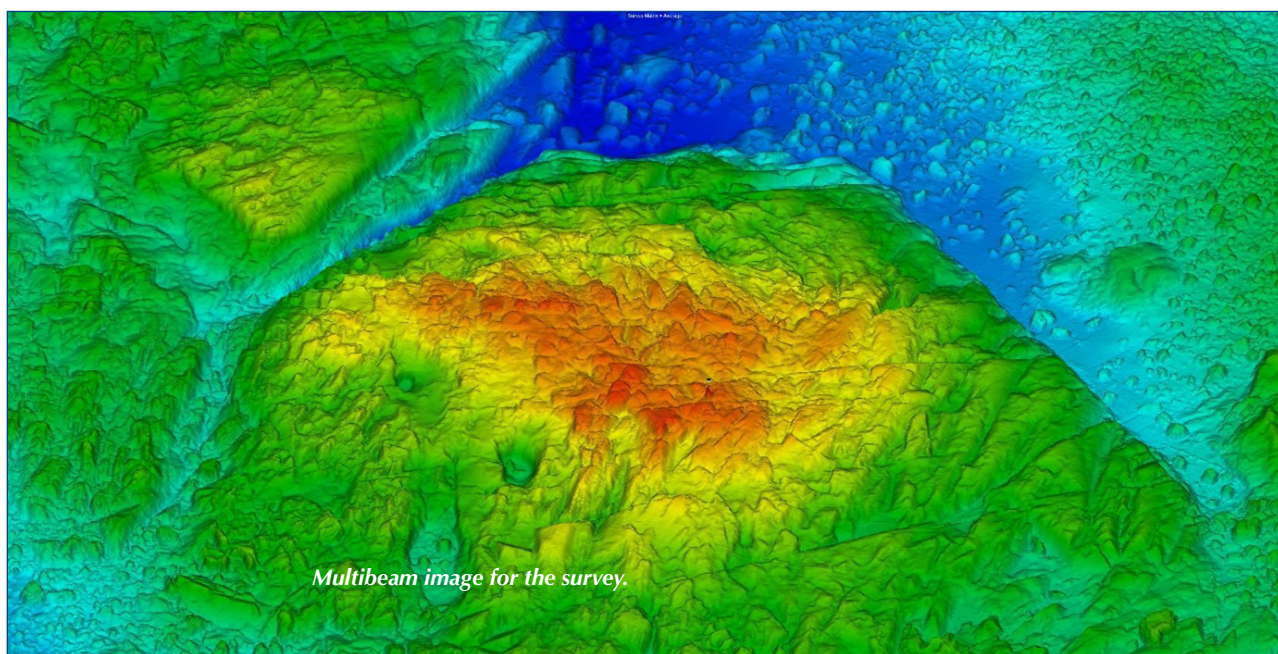
(Top) Satellite view of survey route.  
(Bottom) Survey lines.

This inherent versatility is no accident. “Increasingly, customers’ missions have grown in complexity, requiring a range of sensors, and they’re looking for less costly, less resource-intensive and more flexible solutions to carry out a variety of tasks simultaneously in the challenging ocean environment,” said Buddy Duncan, co-founder of SeaTrac Systems. “SeaTrac’s customizable USVs offer a simple, cost-effective and open platform to perform the dangerous, dull and dirty work with greater efficiency over current methods.”

architecture department 30 years ago, where they both worked on Bill Koch's successful America's Cup campaign, and the duo have been collaborating successfully and delivering products to demanding customers ever since. SeaTrac Systems Inc. is their third company, and it is informed by the same ethos as the first two: to deliver hardware/software products that are simple, reliable and cost effective.

## Londoner Rock ATON Survey

Conveniently for Eric Steele and the ATON survey, SeaTrac happens to be headquartered in Marblehead, Massachusetts, just 24 mi. (16 nautical mi.) down the coast



*Multibeam image for the survey.*

from Rockport and the Londoner ATON spindle. Even better, in addition to manufacturing, selling and renting their boats to customers, SeaTrac performs missions for them, for an hourly, daily or monthly rate.

Steele hired an SP-48 for the day. And so, on an overcast morning in October 2021, a SeaTrac crewmember launched an SP-48 outfitted with a NORBIT iWBMS multibeam sonar, Applanix POS MV WaveMaster II IMU and Hypack Hysweep software from a Rockport boat ramp at 11 a.m. The SP-48 followed a programmed mission to the survey area, where it commenced survey operations at 11:45 a.m. (high tide was at 1:09 p.m.). The initial lines were run to determine the location of the spindle and its relation to the charted position, and the team then modified the mission plan to ensure full coverage in the area near the spindle.

For the next 2 hr., the SP-48 executed the mission plan under the supervision of two SeaTrac team members, one in the office monitoring the remote command station and another in a support boat that was on site to conduct sound velocity profile (SVP) casts. All the while, from his desk back in Falmouth, a hydrographic surveyor

at Steele Associates monitored the data collection in real time over a remote connection.

Working with SeaTrac's technology and team offered considerable time savings for the Londoner survey by turning what would have been a 10-hr. roundtrip effort into 2 hr. of work at a desk, having eliminated a 3-hr. drive each way between Falmouth and Rockport and 2 hr. of launching/diseimbarking/transiting time to and from the site. Using the SP-48 enabled the hydrographers to deliver the Coast Guard results that they otherwise would not have been able to obtain from their manned boat.

"The vessel and sonar head's shallow draft allowed for access and survey coverage in areas beyond possibility with a traditional vessel," noted Steele. "Accurate predetermined sensor offsets and short lever arms resulted in a precise bathymetric data set, which exceeded our expectations.

"The SeaTrac SP-48 has proven to perform well and will be our choice for uncrewed vessel open-water survey missions." **ST**

*Alessandra Bianchi is the communications director at SeaTrac Systems Inc.*