

It's Written in the STARS

From smartphone to sky:
Following the path to celestial navigation.

BY GINA J. GRILLO

What sailor hasn't dreamt about circumnavigating the globe on the open seas and mastering the antiquated craft of celestial navigation — following the path of legendary navigators who, by observing the location of the sun, moon and stars found their way without the use of electronic instruments and technologically-advanced GPS?

Although a successful method for thousands of years, celestial navigation represents for some a romantic practice that with time has become obsolete. With a closer look, we find that for all our tech savvy we may have lost a bit of the art of sailing in the data translation; that in spite of our technological advancements, our tech snobbery may lessen our connection to the natural world and our understanding of our position within it. By learning more about this lost art, contemporary sailors are challenging their inner compass and charting a course by looking up — to the sky and to the patterns of heavenly bodies — in order to find direction.

Backup plan

Bob S. Peterson, engineer and founder of Great Lakes Compass in Elgin, Illinois, makes a living providing navigational expertise to Midwest and Great Lakes mariners.

"Historically, old mariners would have killed for GPS," Peterson says. "But even now if your instruments go down, what is your backup plan?"

Peterson says celestial navigation relies on redundancy

— on being insightful enough not to trust just one source, but rather to look at data from multiple sources and cross-checking your way to accuracy, because even a GPS can have problems.

In 2011, the U.S. Naval Academy reinstated celestial navigation into their training curriculum. According to Peterson, it provides a valuable cross-check, which may guard against the modern threat of computer hacking and the spoofing of GPS signals.

The practice of celestial navigation uses references from celestial bodies instead of buoys or other hard references on land or water. "Although the references are different, the result is a line and position on a chart," Peterson says. "These techniques involve astronomy and time and have been greatly eased by the support and accuracy of digital watches and GPS."

Navigating the Great Lakes

Although celestial navigation is most useful on a deep-sea sail (one providing an open horizon line), it can also be employed while sailing on the Great Lakes. Since Lake Michigan in particular has a number of similarities to an ocean — both in depth and structural characteristics — it can provide a valuable practice arena for longer international sails.

Dirk Lohan is an architect by trade, a self-described life-long sailor and celestial navigator, and also vice president of the Chicago Maritime Museum. Lohan believes the most

important navigational instrument to use on the Great Lakes is a GPS, and suggests keeping two battery-operated units on-board so that one is always functioning.

Generally, Lohan says, aids to navigation on the Great Lakes are landforms, like the Sleeping Bear Dunes, the John Hancock Building or any other recognizable structures.

"Lighthouses are also useful for visual navigation," he says, "and in bad weather, lights from lighthouses and radio direction finders to locate radio signals also help." These methods ensure that a fix (or fixed position) can always be obtained from two good lines of sight.

Wherever the voyage, in celestial navigation the crucial outcome is based on a trustworthy fix. A fix, Peterson says, "equals a latitude and a longitude number; thus, for two crossing lines of position from two star sights at twilight, with a new updated latitude/longitude, your dead reckoning (speed, direction and time) can take over from there."

Understanding a sextant

On the Great Lakes, celestial navigation can be used to accurately assess distance traveled and as a crosscheck for other navigational instruments. Peterson relies on his sextant, especially when he finds himself in a tight spot.

"The thing about relying on the backup of a sextant is that you'd better know how to use it, especially before conditions become dire," Peterson says.

Because accuracy in navigation is based on the use of

different systems in order to verify, Peterson believes that in an ideal world everyone would verify their GPS using celestial navigation, rather than verifying with a second GPS.

"Compasses are the same way," he says. "If you take a reading using two compasses and they both read differently, then which one do you believe?"

It's important for mariners to keep their instruments in good working order, and to ensure that even a compass is properly calibrated. Peterson recommends that sailors keep all tools updated and learn to use all instruments, not just those requiring electricity.

In the 2013 film, "All is Lost," Robert Redford plays a man trying to survive after being lost at sea. "There is a troubling scene where Redford's character, who is already lost, decides to unpack his Celestaire sextant for the first time," Peterson says. Learning under stress, especially in life or death situations, is not the pedagogy Peterson recommends. His advice is to practice often and ahead of time.

For any sailor, an understanding of navigation beyond the GPS is not only a safeguard but also enables a more dimensional, physical sense of where they are in relation to a location. Becoming confident using a sextant comes by taking altitudes of celestial bodies and site reductions.

"Day to day celestial navigation is fun and gets better with practice," Peterson says. "Shoot some sites and begin to know where you are in relation to a global perspective, to the solar system or even to the galaxy." ★

Resources

Here is a short list of highly recommended celestial navigation references for further study.

HISTORY

"The Lost Art of Finding Our Way"
by John Edward Huth

BASIC

"Celestial Navigation in a Nutshell"
by Hewitt Schlereth

BASIC

"Celestial Navigation: A Complete Home Study Course"
by David Burch

ADVANCED

"Celestial for the Cruising Navigator"
by Merle B. Turner

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GREATLAKESCOMPASS.COM
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