

Navicom Dynamics launches GyroPilot



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GyroPilot™ is the latest product in the Navicom Dynamics inventory, designed to provide a compact, lightweight, wireless source of comprehensive navigation data to a pilot's electronic charting system (ECS) when there is no requirement for the data to be independent of the ship's sensors.

HarbourPilot

Navicom Dynamics has traditionally focussed on high-end portable pilot units (PPUs) that aim to provide pilots with very accurate position, heading and rate of turn (ROT), totally independent of a ship's own sensors, as well as industry leading support. The current HarbourPilot™ series systems continue to provide that level of data, with the latest variants using GLONASS as well as GPS to improve performance in poor conditions; most sets are now also supplied with an integrated AIS receiver, giving even greater autonomy to the pilot.

HarbourPilot is not suitable for all customers, however, as many ports feel they do not need such a high level of accuracy and autonomy. To meet market demand, Navicom Dynamics developed alternative smaller and lighter products.

ChannelPilot

ChannelPilot™, currently Navicom's fastest-selling product, was made smaller and lighter than HarbourPilot by adopting a different methodology for determining heading and ROT. Completely independent of the AIS Pilot Plug, it provides position, heading, ROT and AIS data wirelessly to the pilot. The trade-off for size and weight means that it is slightly less accurate than its

'big brother', but well suited for those pilots who have to conduct long transits between the open sea and the berth, through narrow and winding channels. It also offers a good level of capability for smaller ports where the need for PPU support is recognised but budgets do not extend to HarbourPilot-level costs.

AISPilot

At the bottom of Navicom's range – in size, weight and capability – has been AISPilot™: a wireless interface between the ship's pilot plug and the pilot's ECS. Ideally combined with a separate GPS receiver for independent positioning, it provides own-ship position, heading and speed, together with AIS data about other ships. It can also transmit ROT data, but only if it is available from the Pilot Plug data and very few ships make ROT available via AIS, and very few ECS's process that data because it tends to be unreliable (many ships transmit a constant 0).

The other major shortcoming is that headings provided via the pilot plug are integer values, making it very difficult to observe small changes, and what's even more problematic is calculating ROT accurately from the data.

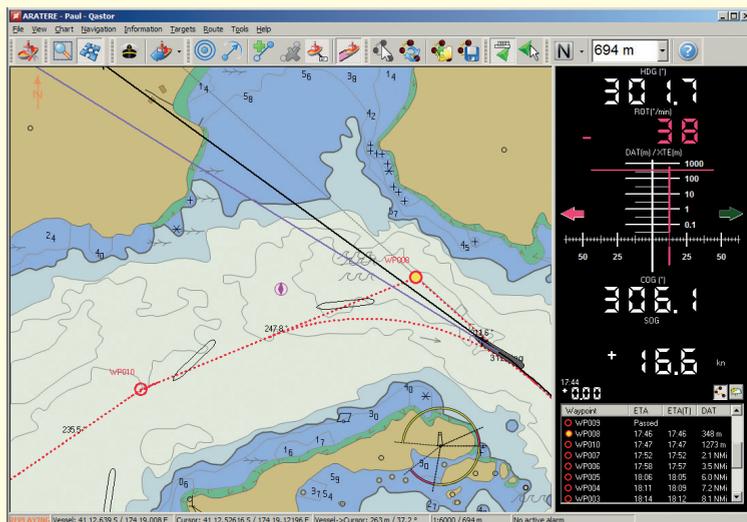
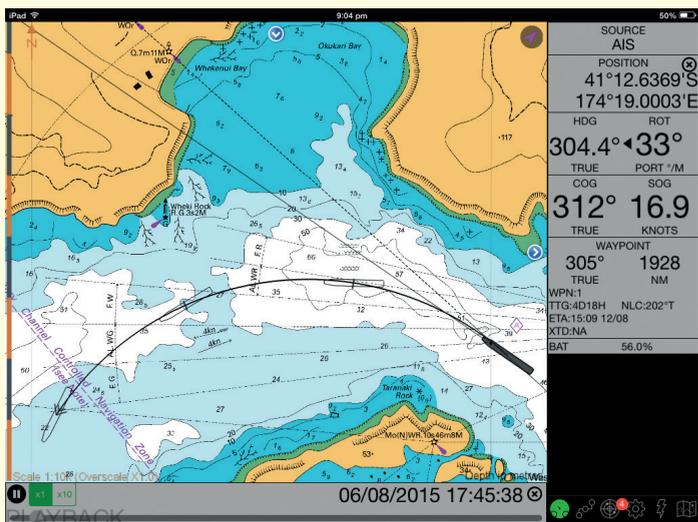
Although AISPilot has proved very popular for Navicom, the market began to ask for a better prediction facility for future positions when using pilot plug data as the major advantages of being able to display future positions when negotiating a bend were becoming ever more apparent. An accurate ROT was necessary to make this possible. The decision was made to completely redesign the AISPilot concept to make

it smaller, lighter, more versatile, and also incorporate an ROT sensor. As a side benefit, using the ROT information enabled Navicom to modify the integer headings generated by AIS and present them with a decimal point. The new product is named GyroPilot.

GyroPilot

GyroPilot leverages off the technology in Navicom's existing ChannelPilot and AISPilot systems, using the gyro stabilisation capabilities developed for the former to provide smoothed heading outputs and accurate ROT. The enhanced outputs enable sophisticated ECS to accurately display a ship's position and to predict future positions while turning, in addition to showing the positions of other vessels in the area. GyroPilot is the successor to AISPilot, which has been discontinued and has a number of special features:

- Auto-sensing of polarity on the pilot plug connection to allow data to flow even with incorrectly wired plugs
- Quick start-up time
- A built in GPS sensor to provide independent position and COG data if the pilot plug is not functioning at all
- The GyroPilot GNSS receiver is capable of high accuracy when placed in an optimum position with a clear view of the sky; it is also capable of continuing to produce reliable positions even inside an enclosed bridge – albeit at reduced accuracy
- Choice of Bluetooth or Wi-Fi for the wireless link, so making it compatible with most mobile devices
- Battery life of up to 30 hours – comfortably exceeding the pilot's



Previous page: GyroPilot; Top left: Aratere entering Tory Channel from Cook Strait, New Zealand - shown in SEAIQ software on iPad using NZ Mariner Raster charts; Top right: Aratere a few seconds later - shown in Qastor software using ENC

- maximum continuous working hours
- Ability to recharge the battery during operation by connecting to a USB socket
- Ability to communicate via a USB cable to a suitable display device
- ROT audible indicator, as well as an alarm which indicates loss of connection (this also reminds the pilot to take the GyroPilot with them at the end of the pilotage)

How to choose a PPU

With such a wide range of products – each of different capabilities - to choose from, pilots and port companies risk being spoiled for choice.

- At the top end, HarbourPilot can offer cm-level accuracy with very accurate heading, ROT, course over ground (COG) and speed over ground (SOG), together with independent AIS reception, making it suitable for all manoeuvres aboard very large, unwieldy ships operating with restricted clearances. Its accuracy is sufficient for use in berthing operations, when used with suitable software which can calculate distances and closing speeds to the berth. It is the system of choice for many ports handling large bulk carriers, tankers and containerships. It is especially useful for LNG carrier berthing, where there are tight restrictions on speed of approach
- ChannelPilot provides a fully compatible capability suitable for use where the constraints are lower but it is still desired to generate the same

inputs to the PPU while maintaining a high level of independence from a ship's systems. ChannelPilot comes into its own where channels are a little wider relative to the vessels navigating them, turning basins have better clearances at each end of the ship and precision berthing assistance is not required. It is also a good entry-level system for ports which recognise the desirability of adopting PPU technology but need to gather experience with such systems before making a final determination as to whether the high-level systems are needed

- GyroPilot works well with smaller vessels in large ports and in open-water pilotage. For use in confined waters it is best combined with an independent GPS receiver to give the pilot a degree of autonomy from the ship's positioning system, as otherwise there is no instrumented way of cross-checking if ship's systems are in error

Conclusion

In practice, many ports employ a range of different sensors. Pilots take with them the appropriate sensor for the operation they are about to perform. Navicom Dynamics sensors all provide compatible outputs and thereby can be used interchangeably with the same software, enabling a relatively seamless change for the pilot when swapping between systems; all that changes is the quality of the source data, so pilots must restrain themselves when

using the lower-level variants not to place undue reliance on the displayed positions in close-quarters situations. Some piloting organisations provide a low specification, easily setup unit like GyroPilot to all pilots and then make available high end PPUs for the more challenging situations.

About the author

After a naval career during which he specialised in navigation and pilotage, Paul Stanley went into the marine electronics industry and subsequently founded Navicom Dynamics to create navigation systems for maritime pilots. Now largely retired, he remains a Director of the company and undertakes sea trials and some sales and training work. Paul Stanley is an FNI (Fellow of the Nautical Institute) and has a BSc.

About the organisation

Navicom Dynamics is based in Auckland, New Zealand and is a global specialist in precision orientation and monitoring systems primarily used in the commercial maritime sector. Navicom is the largest global supplier of PPUs, whether for harbour pilots looking for the types described in this article, or the offshore industry looking for customised berthing aids. Navicom prides itself in being able to respond to all requests for bespoke GNSS positioning systems on land and at sea.

Enquiries
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