



The Global Positioning System, the world's first global utility, has become a proven innovation and a marvel of modern technology. Over a few short years, GPS has changed many of the traditional ways we do things and in a growing number of ways, has changed human kind forever. GPS is now such an integral part of many otherwise 'ordinary' everyday maritime situations, that we are already starting to take this extraordinary satellite-based system for granted. But according to GPS systems analyst Kerry Matthews, the best is yet to come.

GPS

Navigation In The 21st Century

Part Four: Getting Down To The Basics

Fishermen and boatowners have a wide range of GPS units available specifically for the marine environment. Selection of the most suitable equipment is vital to get the best results from the investment.

GPS receivers are designed to generally meet specific markets and even though some have multiple functionality, others are specialised.

Units vary from the simple (but increasingly clever) handhelds, through to the large colour screen combination GPS/chart plotters and specialised mapping systems.

Within the user segment, the term "GPS" is loosely used to generically describe any GPS type navigation equipment.

"Which is the best GPS?" really doesn't have a simple answer, due to the many variables involved. Generally it's not so much the "GPS" but more the user interface - the software driven

capabilities that take GPS positioning data and provide meaningful output to the user in some format or display.

The smallest handheld GPS receiver costing a few hundred dollars is capable of providing the same, basic navigational information identical to the most sophisticated computer based navigation charting systems, costing many thousands of dollars more. In between the extremes, there is a multitude of systems, one of which will generally suit a particular user's needs and requirements.

With so many application requirements and so many different systems available it is not intended to cover the many specifics and unique operating features of any particular unit. This is more about guidance in

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what to consider in the selection process and then some of the GPS 'language' or 'boffin speak' so commonly used in manuals.

The manual is an invaluable reference and it is important that users take the time to read and understand the operating features and capabilities of their particular unit.

Many manufacturers make their manuals available on line for download over the Internet. For buyers contemplating a new GPS purchase these on-line manuals are an invaluable source of information to aid the decision process.

For example, for pure marine use there is no point purchasing (say) a "talking" GPS unit with all the bells and whistles for vehicle navigation. For boating use, one really doesn't require a GPS which could say "For the next McDonalds, change left hand lane, take second exit from next round-

about, proceed 400 metres, take right turn at lights" but I suppose there's always a case to find a quick snack on the way home after a long day on the water!

Cost Is always an important consideration and one of the biggest factors for most people. It can be especially hard figuring out just where does one draw the line? How much are those 'special' features actually worth to you?

Cost can be dictated by many different factors too, such as handheld or fixed mount, what size screen/display do "I" require?

Do I require colour or black & white? What accessories will be required? Antenna type? Power requirements? Interface capabilities? Waypoint/Track/Route capacity? Memory? Will "I" require mapping?

Exactly what do "I" require and what am I going to need?

Mapping Once mapping becomes an option, this opens up a whole new complexity of options. What type of mapping do I require? Will a base map be sufficient, maybe a marine database . . . or will I require more detailed mapping?

What mapping is available for my area; what is the additional cost for the mapping and how does one load/upgrade maps into the receiver? Is the screen size/resolution adequate?

What type and amount of memory does the intended GPS unit have, and with maps, is the speed of the processor fast enough to handle detailed maps when 'zooming' and 'panning' around?

Mapping receivers usually come with pre-loaded (fixed in memory) base maps but these are usually only a generalization of a particular area.

'Marine' receivers might also have a pre-loaded marine database of lights, buoys, etc. Additional detailed maps can normally be uploaded to memory or "plugged in" but must be purchased separately either from the GPS receiver manufacturer or third party mapping provider.

Whichever the case, specific mapping products are limited to specific GPS mapping systems due to proprietary formats and licensing conditions.

Even though when considering a GPS purchase, mapping capability

might not be an immediate requirement, it still could be cost effective to purchase a unit capable of mapping, as the maps may be purchased at a latter time if required.

However purchasing a mapping unit first, only to find the most suitable maps for your area are not supported due to propriety and manufacturer restrictions (etc) can also be costly and not necessarily cost effective.

The detail, scale and level of electronic mapping/charts available might also differ between areas even from the same provider. The more popular (populated) areas provide a greater return to the mapmakers, so it's going to be a lot easier to get good maps of Sydney Harbour NSW than Baffle Creek Qld.

Where should the priority be directed in the selection process? The best combination is the ultimate goal, but I would select the mapping first that best suits "my area" (or intended areas) - then find the most suitable GPS mapping unit that supports it.

Over a period of time the GPS unit will probably become obsolete long before the mapping does especially

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considering some mapping products are quite expensive compared to the actual GPS unit.

But with so many variables, many of these questions can really only be answered by seeing a demonstration. Fortunately, most of the good chandlers have a 'live' type display where one can see the specific charts for the area in question, in the GPS unit under consideration.

GPS receiver specifications

These vary little between makes/models these days. Just about all are 12 channel systems, all have basically equivalent SPS accuracy specifications. Differential accuracy will be a specific, user-justified requirement, which will normally be an additional expense.

WAAS (Wide Area Augmentation System) enabled overseas receivers to offer improved accuracy (with basically no additional expense or equipment) but only within the network of supporting ground stations. WAAS is not available in Australia, and there is much speculation about whether the system will ever be available here.

Current indications suggest it probably won't make it.

Antenna Selection generally comes down to internal or external. There are different antenna types (Patch, Quad-helix etc) with respect to design, but regardless of the type, it's essential that a GPS antenna has an unobstructed 360 degree view of the sky from 5 degrees above the horizon.

Internal antenna models are simpler to install, especially on vessels where cable routing or antenna mounting is a problem. Depending on obstructions, a fixed mount GPS unit with internal antenna might be more convenient accepting there might be some possible loss of signal. Bimini tops, canopies etc are generally ok (not always) but supporting metal structures including windscreen frames as well as people, can all contribute to possible signal and accuracy degradation.

By the time GPS signals reach earth the signals are very weak.

GPS signal strength is only 160dBW or 0.000,000,000,000,000.1 watts - or akin to reading a newspaper in Sydney in the dark with someone holding a flashlight . . . in Perth!

A properly installed external antenna, free of obstructions will generally provide better and more reliable signal reception. As with most small vessels room up top is always limited by the general array of radio aerials, rocket launchers, spot lights, radar domes, etc, that could all contribute to obstructing and interfering with GPS reception.

Not only must one be aware of physical obstructions, but electrical and radio interference, too.