



Basic instruments

Ben Meakins presents PBO's pick of affordable electronics

While it's perfectly possible to go sailing with no electronics at all, knowing what depth of water you've got is about the least amount of information most of us are willing to go to sea with. Add to that your boat's speed and the wind speed and direction and you've got a pretty good set of data to enhance your sailing.

There are so many products out there that we've split this test into two halves. This month, we're looking up at your basic instruments – those that give speed, depth and wind information on functional LCD displays. These might not have the latest NMEA2000 networking or bright colour screens, but they are cheaper and do the job just fine. We'll also look at a few modern alternatives to the 'black box' instrument, in case you're looking to move into the 21st century!

We were going to call this the 'budget' instrument test, but there are so many variables involved in pricing up these instruments that we've stuck to the 'basic' tag instead. Next month we'll move on to the latest N2K screens, which have evolved into miniature multifunction displays.

How we tested them

We mounted each instrument on a temporary washboard on my Impala 28 and wired them up to the boat's 12V supply. We connected them to the boat's NMEA2000 transducers where possible, which sometimes required converter cables. Where impossible we wired in the proprietary transducer for wind, speed and depth, before taking them all for a sail. We looked at how intuitive each was to use, setting a shallow water depth alarm as a test, before observing each in action. We looked at sunlight viewability and viewing angles, and donned a pair of polarised sunglasses to see how that affected the display's visibility. We then tried them out after dusk to see how effective the backlight was.



RAYMARINE i40

Raymarine's i40 instruments have been updated with some software and hardware tweaks, but have been around in one form or another for many years. Contact: www.raymarine.com

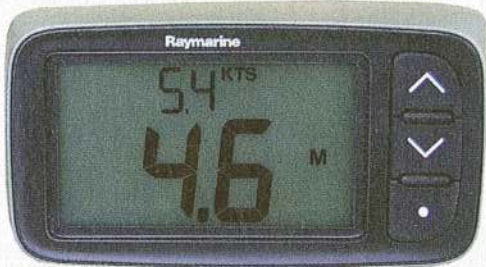
Bidata

PRICE: £395.00 INCLUDING TRANSDUCERS

The i40 is available with separate displays for speed and depth, but we tested the bidata instrument which has two lines of

display, one small at the top and a large number at the bottom. These can be switched at will to display Trip, Log, sea temperature, average speed and max speed. The '*' button swaps the data fields over, and a long press brings up the backlight.

The instruments mount in a 57mm cut-out, and can be secured either with screws behind the bezel or a collar which tightens onto a threaded bar. Damping or 'response' settings can be changed via



the 'user calibration' menu, and we found it was easy to change the keel offset and units in this way as well. Further calibration is also available. Alarms could be set easily too.

Backlighting was red and easily adjusted. There was some shadowing on the screen with the light on but it remained visible, and viewing angles were good. When viewed through polarised sunglasses, the screen went blank at some angles.

Wind

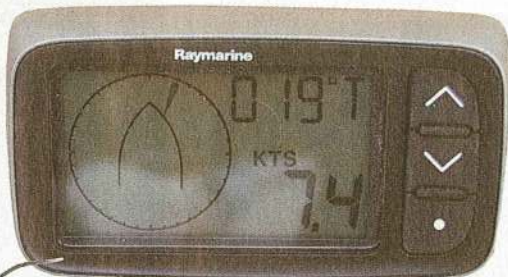
PRICE: £450 (ROTAVECTA)

The wind display is necessarily compact, but it was effective. It can use Raymarine's own Rotavecta (a vertical

anemometer with a tag on one of the cups for directional info) or another transducer – or you can connect it via a Seataalk¹ to Seataalk^{ng} converter to display info from

other sources: we used NMEA2000 successfully. You can either set the display to be a 'master' or 'repeater', depending on your needs. True and apparent wind are available when networked, and you can change units, damping and calibration via a simple menu.

Backlighting was effective – red in colour. There was a little shading on the display, but it remained visible.



One option for the i40 wind is the Rotavecta (left)

RAYMARINE i50/60

Tridata

PRICE: £745 INCLUDING TRANSDUCERS

Like the i40, the i50 tridata display has been around for a while, but it displays information clearly and effectively in three lines. It mounts in a standard 90mm hole and can accept Seataalk¹ and Seataalk^{ng} data, which means the i50 can be used with a wide range of other instruments as you wish. Speed and depth transducers can be connected straight into the unit. The data is fixed, with the top line displaying depth information. Alarms can be set and the keel offset defined using the depth key. Speed data is next, with average, max speed and VMG available. SOG is available if the i50 is suitably networked.

The bottom line can be set to show trip, log, sea temperature and a race timer.

Calibration required the manual for the first go – a twin button press – but thereafter it became easy to program. There are three levels of calibration available – user, dealer and advanced – and with these you can set response



levels and calibration factors. There is a useful speed calibration function which allows you to press a button as you start and finish a measured distance, performing two runs, and the unit will work out the average.

The backlight has been upgraded since we last looked at this model and was a very effective red, with no shading issues. When viewed through polarised sunglasses, the screen went blank at some viewing angles. Without them it was visible from a good wide angle.

i60 wind

PRICE: £945 INCLUDING WIND TRANSDUCER

Raymarine's analogue i60 wind has recently been upgraded and has improved backlighting, among other things. Like its i50 sister, it can either be wired via Seataalk¹ and to its own transducers, or connected to a Seataalk^{ng} network. It worked well on our NMEA2000 network via a Devicenet to Seataalk^{ng} converter cable. You can also wire in a Rotavecta (see left). The arrow was clear and easy to steer to, and moved smoothly and accurately. It could be calibrated well for both wind speed and direction, and the true wind feature worked well when connected to the network.



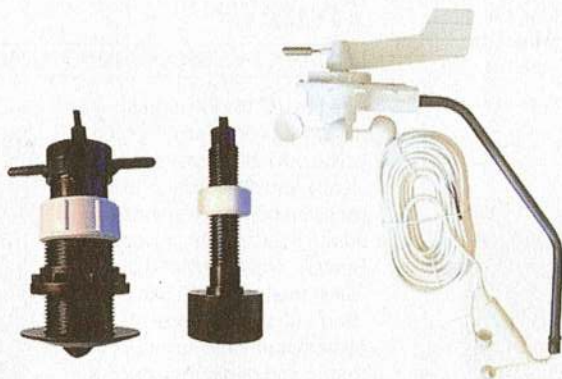
VMG, tack heading, Beaufort number, as well as current, average and maximum wind speed, could be displayed on the small screen. Alarms for maximum and minimum wind could also be easily set.



Raymarine's short-arm wind transducer

NASA TARGET Contact: www.nasamarine.com

NASA are one of the purveyors of simple instruments that do the job well. They sell more of their basic 'Target' range than any other. The range mounts on a surface via a 20mm central hole and four smaller securing holes, with an O-ring to provide watertightness.



Target Wind Speed/Direction

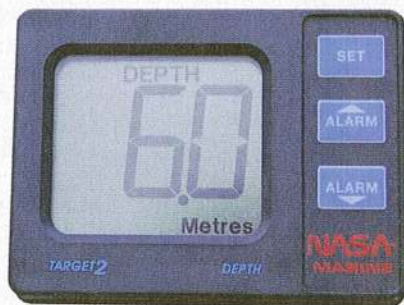
PRICE: £178 INC TRANSDUCER

Wind information comes via NASA's proprietary wired masthead transducer, which wires into the back of the display via a four-way terminal block. This worked straight out of the box. With a press of the up/down buttons you can adjust the size and attributes of the direction arrow. You can also calibrate the wind angle by holding the vane head to wind and pressing all three buttons. There's no option for true wind, as no networking is available. It's simple, but it shows apparent speed and direction well. It updates the wind once every second. The backlight was good, although had some shading, and the viewability was good, owing to the matt screen which reduced glare and improved the viewing angles.

Target Speed/Log

PRICE: £105 INC TRANSDUCER

There are three keys and three functions on the speed/log instrument, which allows it to display speed, trip and log data, up to 999NM. It will only display in knots, and a long press on the trip button resets the trip figure. The light is controlled by the top button. Transducer connection is via a coaxial plug on the back of the unit, and the transducer itself, while lightweight plastic, seemed effective. You can calibrate the speed if required.



Target Depth

PRICE: £105 INC TRANSDUCER

The target depth was simple to use, and setting an alarm was both intuitive and easy. The transducer is of the type which can be mounted 'in-hull', thereby negating the need for another hole in the hull. Most are epoxied in, with a quantity of oil or other liquid between transducer and hull to allow the sounder to transmit through the hull. You can set alarms for shallow and deep water, and also input a keel offset. You can also adjust the 'gain' to improve the accuracy of the unit.

The transducer will work from 0.8m to 100m – which means that it's liable to go on the blink in very shallow water unless your offset is 0.8m or more, which shouldn't be a problem in most boats.

There is no internal buzzer or alarm – an external one can be wired in if you require an audible alarm. Viewing with polarised lenses led to invisibility at some angles.

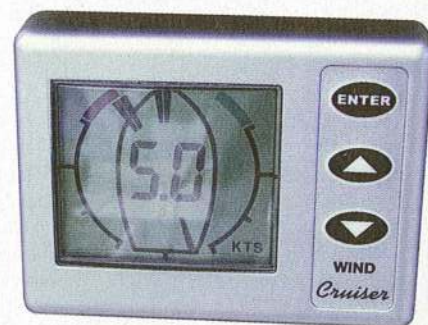


NASA CRUISER

NASA's Cruiser range features the same software and displays as the Target range, but housed in a different case. They are exactly the same to use, but have blue backlights instead of red. We found the data to be less visible than the Target range – the curved, glossy plastic in front of the display meant that it was prone to reflections and harder to see from an angle. Cut-outs were the same as for the target range – a 20mm central cable hole and four 4mm mounting holes.

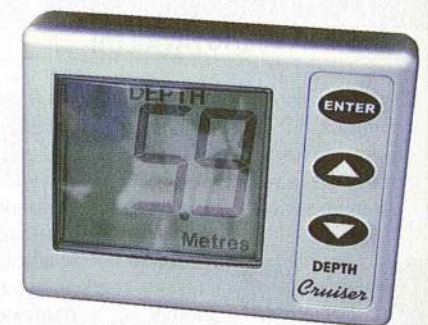
Cruiser Wind Speed/Direction

PRICE: £191 INC TRANSDUCER



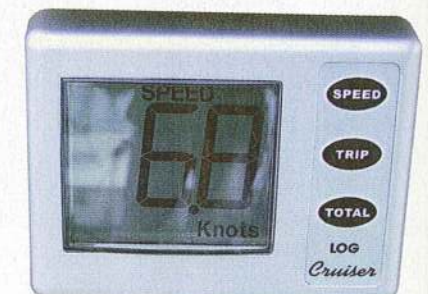
Cruiser Depth

PRICE: £117 INC TRANSDUCER



Cruiser Speed/Log

PRICE: £117 INC TRANSDUCER



NASA CLIPPER

NASA's Clipper range has the same 110mm square size as most standard instruments. Individual instruments for speed, depth, compass and wind are available – or you can go for a 'Duet' which displays both speed and depth.



Clipper Duet

PRICE: **£208** INC Tx

The Duet mounts in a rectangular cut-out and is secured by a spreader bar and a wing nut on a threaded rod. Connections were straightforward – two power wires – and there are two sockets for depth and speed transducers. The buttons were simple to use, and we found it easy to set a shallow and deep alarm respectively, while the keel offset was also easy to change. Depth units could be changed from feet to metres, and speed units could be set to mph, knots or km/h.

The transducers were the same as for the Target and Cruiser instruments, with the depth

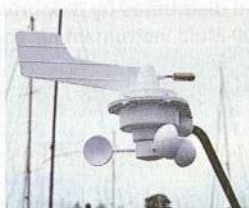
designed to be mounted in-hull and a plastic through-hull speed transducer. At £208 for a full system of speed and depth, the price really can't be beaten.



Clipper Wind System

PRICE: **£230** INC TRANSDUCER

The Clipper Wind instrument uses the same wind transducer as the Target and Cruiser ranges, a wired masthead unit. This wires into the back of the display, via a circuit board with wire clamps for each core. The display allows you to align the masthead instrument, and can also output the data via NMEA0183 if required. As with the other NASA wind instruments, you can select the pointer style with a few button presses, and change units from knots to mph. It updated the wind direction once per second – NASA have recently bought out a 'tactical wind display' which offers 10 updates every second for increased responsiveness. We found the slower update rate fine for an indication of



what the wind was doing, but to steer to an apparent wind reading, the tactical system would be an improvement.



Clipper Wireless Wind

PRICE: **£349** INC TRANSDUCER

A new product from NASA, this system removes the need for wires running down your mast. The masthead transducer contains a small battery and solar panel, which transmits to a wired base station. We found that it worked straight out of the box: and despite testing on a dull December day for a number of hours, battery power wasn't an issue. NASA claim that it will work for 2,000 hours in total darkness once charged. We walked the transmitter down the pontoon to see what the range was like and it still worked over 100m away. Updates were at the same rate as the Clipper wind system, and the base unit can send NMEA0183 data to any suitable display. On all the Clipper displays the backlighting was effective, with nine levels and shading confined to the corners. When viewed through sunglasses, some shading was observed.



GARMIN GNX20

Contact: www.garmin.com

PRICE: **£349** (DISPLAY), **£1,219** FOR 2 DISPLAYS AND WIRED TRANSDUCERS

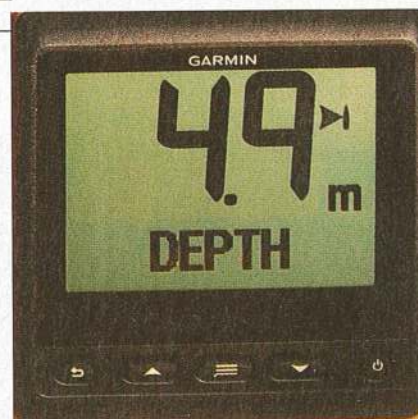
Garmin has recently launched their GNX range. The GNX20 has a bonded display to avoid fogging, and can display data in either large LCD digits or a dot-matrix display on the bottom of the screen – which allows for graphs or secondary data fields. It accepts data from NMEA2000 sources, and also has a NMEA0183 port on the back. You can select one of seven backlight

colours to suit your taste. We found the white worked well on a dull day to boost the display, and preferred red at night.

The GNX20 will work with Garmin's new gWind Wireless system, and a wind display is also available, as are packs including two displays and wired or wireless transducers. The interface was simple to use and data fields were easy to

configure. Compatible transducers can be configured and calibrated.

The GNX20 is a multifunction display and as such crosses over between the 'basic' instruments on this test and the multifunction colour instruments next month. The display was effective in sunlight and worked well with polarised lenses. All in all a powerful range at a good price, with wireless options.



TACKTICK/RAYMARINE WIRELESS

Contact: www.raymarine.com

Bidata

PRICE: £795.50 INC TRANSDUCERS

Since they were bought by Raymarine a few years back, the Tacktick range of wireless instruments hasn't seen much development save a branding change, although we understand that a NMEA2000 converter is on the cards. We tried a bidata instrument, which could display all the info on the wireless network. The transducers are wired to a hull transmitter, which then sends the available data wirelessly to the displays. Calibration can be carried out easily, and depth offsets and alarms can also be set once you know how the keys work.



The displays are very customisable – perhaps a little too customisable, as you have to scroll through all available data to find what you want. An easier way is to set up pages, which you can then scroll through – this one was set to speed and sea temp. The instruments themselves are solar-powered. They suffer a little when viewed through polarised lenses, but they were otherwise highly visible.



LEFT Speed, depth and compass transducers are wired to the powered Hull Transmitter, which then distributes the data wirelessly

Mn100-2 Wind

PRICE: £945 INCLUDING TRANSDUCER

The wind instrument has a 'wind rose'-type display and can display wind direction, close-hauled display (zoomed in on 0-50°), VMG and other info. True wind is available when the instruments are successfully networked. No base station is required for the wind display (unlike NASA's wireless wind) – instead, the solar-powered masthead unit transmits straight to any compatible displays.



Backlighting is available – and in many years of using these for night sailing they never ran out of battery. However, the displays can be quite hard to read at night from anything other than directly in front, with the unused parts of the LCD showing quite strongly.



The wireless masthead wind transducer transmits its data straight to the instrument network

ADVANSEA

Contact: www.plastimo.com

The Advansea range of instruments is made and sold by Plastimo, and distributed by Bainbridge in the UK. A full range of depth, speed and wind stand-alone instruments is available, of which we tested the S400 Multi instrument for speed and depth and an analogue wind display.

Advansea S400 Multi

PRICE: £562 INCLUDING AIRMAR TRANSDUCERS

The Multi instrument will display two lines of customisable data, with 22mm-high digits on the lower line and 32mm-high on the upper. The instruments have their own proprietary bus system, so they can be networked for true wind and other calculations and data sharing, or can transmit and display NMEA0183 data. Mounting was via a single 48mm circular cut-out, fixed with a threaded collar.

Depth range was from 0.5m to 199m, and we found it easy to set deep and shallow alarms. The up and down arrows cycle through top and bottom lines respectively, which took some getting used to. A keel offset could easily be set, and the data from depth and speed transducers could be effectively damped if required.

Battery voltage was available, as was an alarm. The amber backlights on these instruments were the clearest and the best of all the instruments we tested, with no shadowing, and the viewing angle was excellent with minimal reflections. When viewed with polarised sunglasses they remained visible at all angles.

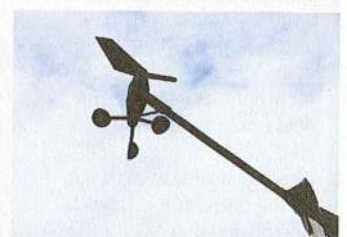


S400 WIND-a

PRICE: £675.89 INCLUDING WIND TRANSDUCER

A digital wind display is also available, but we tried the analogue display. It mounts as the other instrument, in a 48mm cut-out. The pointer could be damped and adjusted easily to suit, and it provided a clear display – the white background was clear and easy to read. When connected to the Multi instrument it displayed true wind speed.

The transducer was well made, lightweight and of a low-profile design, and connected to the back of the instrument via a coaxial plug. Alarms were easy to set for high wind speed and battery voltage, and the backlight was just as good as on the Multi instrument.



Advansea's wind transducer

MODERN ALTERNATIVES



Digital Yacht WindSense

PRICE: £450

Contact: www.digitallyacht.co.uk

This is a new product from Digital Yacht that can be used as both a replacement for a faulty masthead transducer for NMEA0183-compatible displays, and as a wind data feed to wireless networks. The sensor itself is wired to the connection box, which can also accept other NMEA0183 inputs and multiplex them so that all your data is available over the Wi-Fi network on a phone or iPad display – or you could use an eReader (see right).



Waterproof eReader

PRICE: £50

Contact: <https://us.kobobooks.com>

Tablets and phones are all very well, but they are hard to read in sunlight and expensive – and need regular charging. Here's a potential solution. For £50 you can buy a waterproof Kobo e-reader (a Kindle is pictured above), which can view the iKommunicate's data via its inbuilt browser and display it on screen. You could mount one or more of these displays around your cockpit with Velcro, and as e-Ink uses so little power they should last for weeks without a charge. The screen is also highly sunlight-viewable. Downsides are that unless you buy one with a backlight you won't be able to see them at night, but as a way to upgrade your system using your existing NMEA0183 transducers and get all your data onto a tablet, it's worth a look.

iKommunicate

PRICE: £264

Contact: www.ikommunicate.com

This is an open-source project, so anyone can code and try out apps. That said, a few simple ones are already available. The iKommunicate box takes inputs from all your existing transducers, be they NMEA0183 or 2000, and transmit the data over a Wi-Fi link using the Signal K protocol. You can then view it on your tablet or any device with a web browser on apps that are either developed by you or third parties.



PBO verdict

Eighteen instrument displays is a lot – and we haven't even covered the new generation yet (see next month for that test). At the more affordable end, NASA's Target displays offer simple data at a competitive price. Their Clipper Duet is a very cost-effective way to get speed and depth on board, and their wireless wind offers a good display with no mast wiring, and worked straight out of the box.

Further along, Advansea's instruments offer good functionality and clear displays with excellent backlighting at a reasonable price. They are good competitors to Raymarine's i50/i60 range, which have

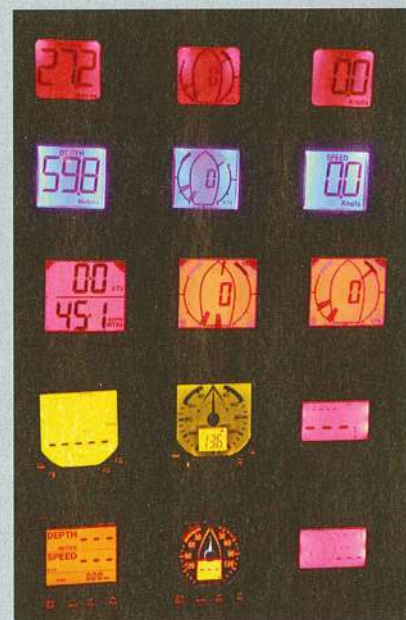
long set a good standard for basic instruments. However, now that Raymarine has added Seatalk^{ng} compatibility, these offer excellent scope for adding to a modern network, or as forming the basis of a modern system that you can upgrade effectively later on.

Quality display

The Tacktick instruments still occupy a good niche, with very low power consumption – but they aren't as user-friendly as some others and are relatively expensive. Raymarine's i40s offer a good compromise, of relatively low cost and simple functionality and a quality display.

At the end of the day, it's up to you – if you want a simple, stand-alone instrument then one from NASA will do the job well. If you want a network of instruments, then it's hard to beat Raymarine's offerings (especially now the i50s have Seatalk^{ng} connectivity for easier networking and future upgradability). Garmin's GNX20 is also worth considering. If it's a modern network you're after, don't miss next month's test of the latest colour multi displays, which aren't much more expensive than some of these instruments.

If you're upgrading you may be able to use your existing transducers, which reduces prices significantly.



Night shows the difference in backlights

All prices quoted are correct at time of going to press