



# Mobile Phones at Sea

Recent advances in communications technology have revolutionised the use of mobile phones. Until recently, however, seafarers have not been able to use the technology that has become standard for the rest of the world. Crews on board merchant ships have had, up to now, to rely on expensive satellite connections for contact with family, friends and work colleagues.

All this has now changed. Blue Ocean Wireless (BOW), an Irish company based in Dublin and Southampton, has recently launched the world's first dedicated mobile telephone network for the merchant maritime sector.



Merchant crews can now make and receive calls or send and receive SMS messages as soon as they leave the range of onshore GSM networks. Crew members are given Blue Ocean Wireless SIM cards free of charge to use in conjunction with their existing handsets. The transition to BOW is virtually seamless and the network is global. The seafarer can make and receive calls and text messages, anytime, anywhere in deep ocean water. The same affordable global rates apply in all corners of the world. BOW also provides a dedicated crew email service, whereby the only requirement on behalf of the user is a crew PC.

Because the BOW system is specifically designed to work outside territorial waters, it does not interfere with land based GSM services. Built-in coordinates via GIS (geographic information system), which are also linked to the ship's GPS input, ensure that the system shuts down automatically 12 nautical miles from shore.

Benefits of the BOW network are numerous, but most importantly it greatly enhances the quality of life on board for Officers and Crew. Easy contact with those on land via the familiar means of their mobile handsets is leading to greater satisfaction amongst crew members and increased staff retention on BOW enabled ships. The work and responsibilities of a ship's owners and officers have also been supported by the enhanced degree of contact, enabling the progress of a voyage to be continuously monitored and reported.

## How it works

The network uses picocells, small base stations located in accommodation areas on board the ship. The Picocell (GSM BTS) is mounted on a wall or ceiling beneath the stairwell of the vessel and connects back to the SMART GSM network via a remote gateway.

Picocells have, until now, been used to enhance indoor network coverage within buildings such as large offices, so their application for communications technology over deep ocean waters is an exciting development. Managing this service and acting as a satellite router is a custom built system based around the APOLLO board supplied by Eurotech, a leading developer and manufacturer of embedded single board computers, application-ready platforms and configurable systems.

Tim Taberner, Sales Manager of Eurotech commented: "Maintaining contact with land via a mobile phone network is important for the morale of the crew, especially on long voyages. It can also be a powerful support for logistics and plays a role in the ship's safety. There are 50,000 merchant ships in the international trading fleet and until now, those aboard have not been able to enjoy the same degree of contact as the rest of us. There is great potential for development in this area and we are pleased to be able to take part in BOW's innovative initiative, opening up this distinct new area of global communications."





## Task of the APOLLO

The Eurotech Remote Gateway (RGW) system employed by BOW is a bespoke version of the company's APOLLO range of embedded systems, which offer rugged, fanless PC interfaces. Bolted to the ship's bulkhead, it can withstand extremes of temperature, shock and vibration to provide a robust, high quality voice and messaging service for mobile telephones in all conditions. The system also requires minimal maintenance.

Mobile phones aboard the vessel send and receive voice and data messages through the ship's mobile transceiver station. This base station is connected to the RGW which converts the voice and data signals received into a narrow band signal for transmission over the satellite network. The BOW system works over any satellite provider, but to work over the Immarsat satellite network, a ship would need two complete JRC F-33 (JUE-33) terminals (BDU and Antenna). The JRC terminals are specifically configured to only support connection to the Blue Ocean Wireless Remote Gateway.

The collaboration between Eurotech and BOW started in earnest last year and there have been a high number of installations per month. APOLLO systems are powered by Pentium M based single board computers designed and manufactured by Eurotech.

The systems feature:

- Fanless operation
- Solid state disks for operating system and storage
- Multiple serial and ethernet ports
- Integral LCD display for diagnostics & status messages
- Operating temperature range from + 5°C to + 55°C

With options for integrated wireless modules, the APOLLO's front panel LCD display and navigation buttons can be used for user-defined configuration and control for deeply embedded systems that do not have access to a display. The APOLLO is CE/FCC compliant for EMC conformity. As importantly, Eurotech provide and pre-port the underlying embedded Linux operating system, relieving the development team from the burden of sourcing and maintaining the correct drivers etc. through the lifetime of the system.

Eurotech is involved with the development of its products from the initial concept, followed by the complete electronic, mechanical and software design, through to extended lifetime technical support.

The company's customer base covers a range of sectors including transport, communications, defence, security and industrial engineering. This provides its engineering and support teams with a wide range of experience in hardware and systems design, embedded operating systems and communications protocols.





## Expanding market

The potential for an ocean-wide mobile communications service has been demonstrated by the keen interest generated in the BOW solution and the strong market take-up of its offering. To date hundreds of vessels have been installed with BOW's service, with many more in the pipeline.

Recent additions to BOW's customer base include the Hong Kong based Wallem Group, which provides its international range of clients with ship management, ship agency, ship broking and IT services. Over 6,000 seafarers work in the company's managed fleet of over 350 vessels, which include tankers, cruise ships and bulk carriers. In the period between the announcement of the initial installation in October 2008 and Christmas of that year, approximately one quarter of the fleet was using the service and many more ships have since been installed.

This was followed by a further announcement in December 2008 that the BOW service was to be installed in the 300 fully managed ships of Bernard Schulte Shipmanagement (BSM). The company has a total international fleet of 700 ships, including container ships, tankers and a range of specialist vessels, with 17,000 onboard employees.

In both cases, the crews, ships officers and the shipping company management have reacted very positively. Jim Nelson, Wallem Shipmanagement Managing Director, said that the service had been a welcome Christmas present for the company's seafarers. CEO of BSM Andreas Droussiotis also claimed that the ability to send and receive calls in private had been a significant improvement in the lives of their crew.

The partnership with BOW is an example of Eurotech's strategy to identify and involve itself with new and emerging markets. This mobile network at sea is proving to be a very promising area of development.



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