



## Royal New Zealand Navy Case Study

### A Glimpse at New Zealand's Armed Forces

New Zealand's armed forces developed from those of the United Kingdom and initially provided security for the European settlers in New Zealand. In the early 20th century, independent New Zealand armed forces developed; the Royal New Zealand Navy was the last to emerge as an independent service in 1941.

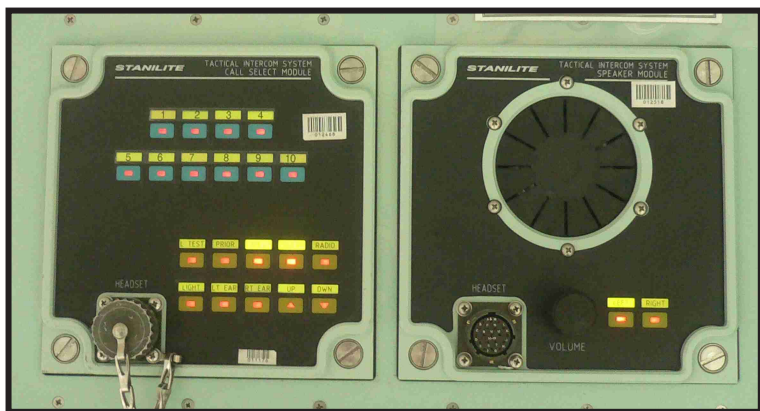
Today, the Navy is based at Devonport, Auckland, where the shore establishment HMNZS PHILOMEL is responsible for the administration, supply and training support to the sea-going ships. The ANZAC frigates HMNZS TE KAHA and TE MANA are utilised in training simulations for the command team and operational personnel working on the ships. Communication to land-based stations from aboard the ANZAC frigates aids in the training sessions and rely on simulator units that were originally built by Stanlite Pacific. The system is called the Combat System Tactical Trainer (CSTT). According to David Adams, Technical Manager with the Royal New Zealand Navy, "When Stanlite Pacific was bought out in 1996 by ADI, the training systems installed were no longer supported." The Navy now required a new system to continue training simulations effectively into the future.

## The Project: Reverse Engineering an Outdated Communications System

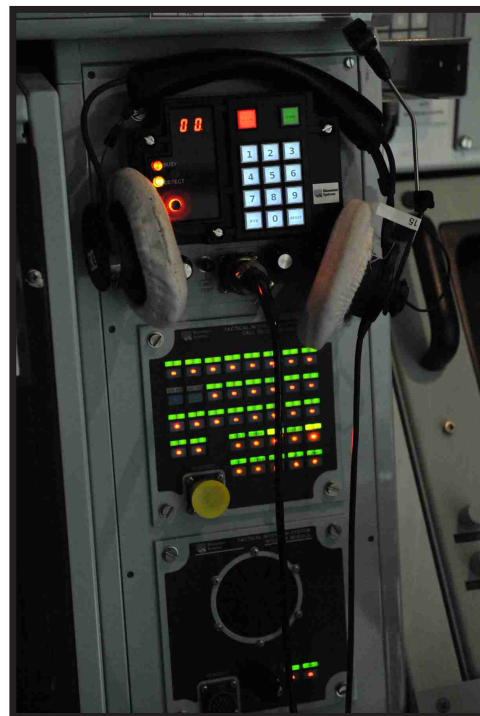
The Navy needed a *Form, Fit and Function* replacement for the land-based communications stations in their Combat System Tactical Trainer that was supportable into the future and allowed for the Navy to conduct full Command Team Training. This involved retrofitting the old Stanlite Pacific simulator units with the CSTT to provide a replacement that would ensure its ongoing usefulness in creating realistic, real-time training.

“The simulator is now more than 10 years old, and because it was custom built at the time, there were very limited spare parts for repairs. The communications systems have now reached the end of their useful life, so we required a supplier who could reverse engineer the hardware and software to deliver the same systems that are currently being simulated, and be able to support it going forward.”

“The war games scenarios our instructors run are very realistic and can be quite dramatic, with personnel having to deal with incoming missiles, communicating with the helicopter pilot, communicating with the bridge and other parts of the frigate and generally rehearse the skills required to run the frigate under combat conditions,” Adams says.



The Stanlite Pacific control panel (above) was replaced by Bluewater Systems' reverse-engineered solution (right) so that the Navy's Command Team Training can continue to be supportable into the future.



Instructors in the control room sit at six instructor stations and act as the rest of the ship, using a touch screen system to respond in different roles. The replacement system included 15 broadcast communication stations and two paging stations.

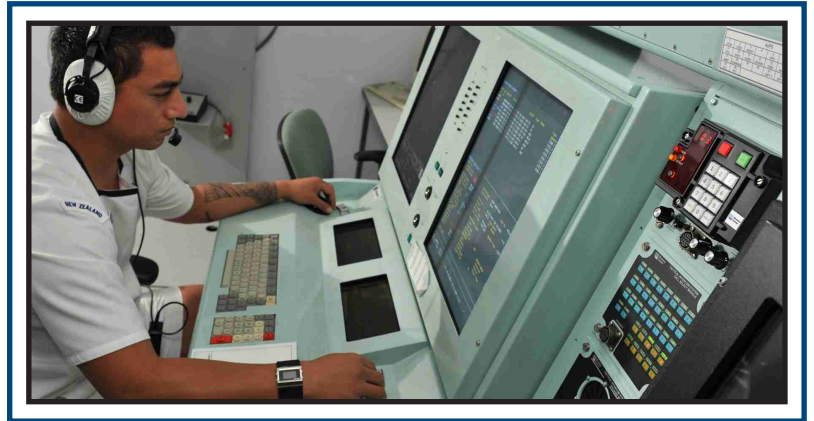
Bluewater Systems submitted a tender for the project, based on using its in-house ARM expertise and the ready availability of ARM-based SOMs (System on Modules), making it possible to quickly and cost effectively build a custom solution that could provide all of the applications required by the Navy.

“Bluewater impressed with their tender, which was one of three or four on our short-list. At the end of the day, they won because of a sharp price, their professionalism and expertise, and their ability to deliver quickly to our specifications,” Adams commented. He also noted Bluewater's experience in conducting a similar process for Telecom New Zealand, replacing ageing magnetic tape storage systems with a custom built digital data storage unit (done through NEC NZ), was one of the deciding factors in the selection of Bluewater for this project. The contract was awarded to Bluewater Systems in May 2008.

## The Solution: Supportable Technology, Reliable into the Future

Bluewater Systems developed a new communications station by reverse engineering the Royal NZ Navy's existing system to provide identical emulation in the training simulations by using its ready-to-use ARM-based Snapper System Modules. This afforded the Navy the ability to easily and quickly implement the new system and continue delivering the intensive level of training provided by the original simulation units for combat conditions.

There were two main priorities relating to the Navy's project goals. Adherence to their proposed time scale and the functionality meeting the requirements of the original Statement of Requirement (SOR). Throughout the project, there was rescheduling of a milestone due to the late delivery by one of Bluewater's suppliers, which resulted in a change of only one week. There was a second rescheduling resulting from a request from the RNZN to accommodate the training schedule.

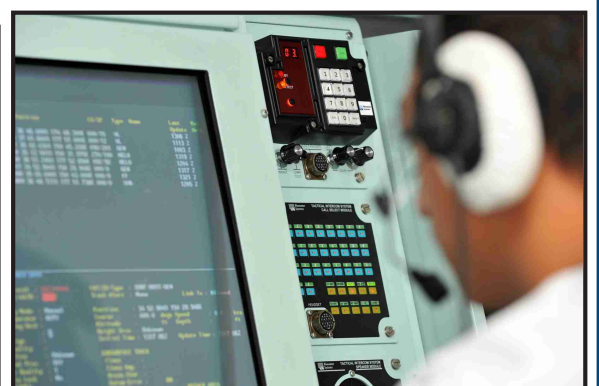
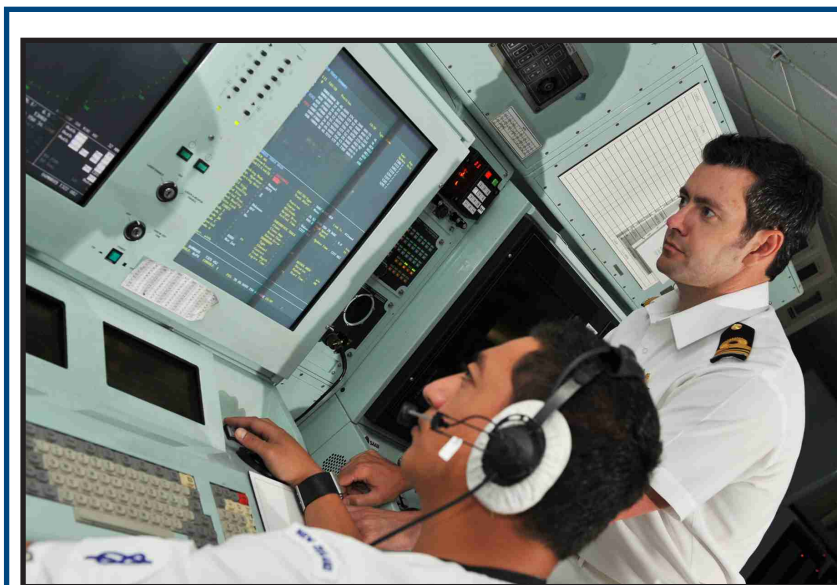


Other than these two interruptions, Bluewater's adherence to the time scale was very good. Bluewater also maintained the functionality laid out in the SOR and according to David Adams, "The physical 'Man-Machine Interface' is a very good emulation of the original equipment."

Bluewater Systems' CEO Sarosh Dubash comments that the project was a challenging one for the company, but proceeded very smoothly. "We were able to hit all of our milestones to deliver on schedule, despite having to work from very limited support information about the protocols used in the existing system. However, we did have excellent support and partnership from the RNZN team."

## Benefits Provided by the New Training System

After the contract was awarded in May, by August, a prototype unit was successfully tested on-site in Devonport. The early delivery of the hardware allowed the Navy to install it ahead of schedule and do some evaluation of the system. The Navy perceived throughout the project that the new simulation units would enhance training outputs, increase hardware and software supportability and increase the reliability of the hardware. Each of these elements were achieved in the final design Bluewater provided



The new simulation units designed by Bluewater Systems for the Royal New Zealand Navy has enhanced confidence in the availability of the system for training and enhanced functionality of the CSTT as a whole.

to the Navy. The equipment was delivered in full in early November, ahead of the original schedule. Installation was completed in December 2008 and the system is working exactly as expected, with installation being simpler than the Navy had anticipated.

David Adams says, "Bluewater Systems have always shown a willingness to provide the most comprehensive solution to our requirement that was possible and have been very accommodating when information provided to them was limited. The progress has been very satisfactory. The solution we've been given has enhanced confidence in the availability of the system for training, enhanced confidence in the ability to maintain the system and enhanced functionality of the CSTT as a whole."

## About the Royal New Zealand Navy [www.navy.mil.nz](http://www.navy.mil.nz)

The Navy's vision is "to be the best small-nation Navy in the world," reflecting the unique nature of our business upon the oceans. Our Mission state the purpose of our navy: "To contribute to the security and prosperity of all New Zealanders through the delivery of versatile, responsive and effective Maritime Military Capability across the spectrum of operations."

The Navy's routine operations stretch across the South Pacific and South East Asian regions, but our roles in international peacekeeping and regional security also mean our ships and naval personnel have served further afield. In 2002, 2003 and 2004 New Zealand has deployed frigates to the Gulf of Oman as part of a multi-national task group conducting Maritime Interdiction Operations in the region. Naval personnel have recently served ashore on peacekeeping duties in Afghanistan, Bosnia Herzegovina, Israel and Korea, while naval ships and personnel have also deployed to East Timor in recent years.

## About Bluewater Systems Ltd. [www.bluewatersys.com](http://www.bluewatersys.com)

Bluewater Systems, a fast-growing company formed in 1996, is an ARM Technology Solution Centre, specialising in embedded electronic and FPGA design. With offices in Christchurch, New Zealand and the United Kingdom, Bluewater Systems services a number of local and international customers, including ARM, NEC and the Defence, Science and Technology Organisation of the Australian Department of Defence.

The company's vision is to empower all companies to realise the benefits of ARM technology through engineering and design services, development tools, support and ARM-based system modules. Products and services offered by Bluewater Systems include:

- Consulting services, from FPGA design to full product development
- Snapper Single Board Computer Modules, which enable fast and cost-effective design turnaround
- Extensive range of ARM, Keil and RealView development tools

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