Welcome to the latest issue of SEA News which focuses on our Maritime capabilities and exciting developments in the run up to a number of key global exhibitions, including DSEi, Pacific 2019 and D&S Thailand.

2019 has been an extremely busy and successful year for us and we are proud to be able to showcase our cutting-edge capabilities as well as launching new products into the global market at DSEi in September.

We have now bolstered our Anti-Submarine Warfare (ASW) offering with the introduction of a tailorable ASW training service which complements SEA’s innovative Krait Defence System to provide a complete ASW solution. We will also be unveiling our new trainable Decoy Launcher System to counter threats posed by hypersonic and multi-mode seeker heads. Delivered through a partnership with Cohort businesses, MASS and Chess Technologies, it clearly demonstrates the strength and synergy of the Group’s offerings.

Over recent months there has been considerable interest in our latest generation KraitArray™ which has developed considerably since launching at DSEi 2017. The enhancements, including increased length to 150m and improved performance on the miniature acoustic sensors, ensure that navies can access effective and affordable ASW technology in a small form factor boosting their existing capabilities and also enabling those with smaller platforms and budgets to access this critical technology.

In September 2019, we will be demonstrating our Krait Defence System in NATO exercises off the coast of Portugal which will clearly show the role low cost ASW technology has in enabling world navies to defend themselves against the increasing number of deployed submarines.

We would like to thank our teams and partners for their continued support and should you be attending any of the above exhibitions we would be delighted to welcome you to our stand.
Anti-Submarine Warfare

There is a proliferation of nuclear and conventional, manned and unmanned submarine systems in the hands of potential aggressors demanding a revolution in the approach to anti-submarine warfare.

This is focussed on deploying large numbers of persistent sensors to give a clear view of activity in the oceans. SEA is playing a leading role in delivering this ASW Revolution. SEA has spent many years developing and miniaturising sonar technologies which meet the need to protect our marine assets.

The result is the KraitArray™ family of low profile acoustic systems. KraitArray™ is deployed as a towed array from surface ships as small as 20m or as large as a frigate. It is towed behind a number of unmanned surface and submarine vessels, it is deployed as a fixed vertical line array to protect specific areas and it is attached to seabed structures to provide continuous monitoring and provide a clear picture of undersea activity.

Although a number of these systems are now deployed and in service; SEA have embarked on a worldwide demonstration program which will see high performance low profile KraitArray™ operating with OPVs, various Autonomous Surface Vessels, manned and unmanned submarines and SEA’s “in-house” SeaDrix™ Submarine Hunting System.

The SeaDrix™ can be launched as a single unit to support ASW search operations or as multiple units to create a submarine Acoustic ASW Barrier over 100miles long.

These systems have been integrated within the existing ASW infrastructure to deliver a force multiplier out of all proportion to its cost. Linked to ASW weapons and countermeasures it is a powerful deterrent and denies aggressors access to our home waters and areas of operation.

Thanks to the innovative engineers at SEA the oceans are becoming increasingly transparent and are no longer a safe place to hide for uninvited guests.
KraitArray™

Since its launch at DSEi in 2017, the KraitArray™ has undergone considerable developments combining cutting edge technology together with proven capability.

**Version 1**
- Single 50m module
- Up to 32 acoustic sensors
- Up to 5 non-acoustic sensors
- Low power
- Analogue array with digital interface
- Designed for small unmanned surface vessels
- First deployed in 2016

**Version 2**
- Multiple modules up to 150m total length
- Up to 192 acoustic sensors
- Up to 24 non-acoustic sensors
- Lower noise floor
- Low power
- Lower frequency operation and higher sensitivity
- Designed for an increased range of applications
- First deployed 2018

Our outstanding KraitArray™ is just 16 - 20mm in diameter and maintains the low cost whilst boasting a lightweight design and ease of use.

**PORTUGUESE KRAIT DEFENCE DEMONSTRATION**

In September 2019, SEA will be participating in NATO exercises off the coast of Portugal. This will see us install our Krait Defence System on a Portuguese OPV, which will then take part in active exercises to demonstrate its innovative capabilities.

Our experts will transport the equipment to Portugal in a matter of days and fit the KraitArray™ at the dock side. Integration on the water ensures that there will be minimal impact on the vessel as it removes the need to use a dry dock or specialist ship yard. Following the exercise, the equipment will be rapidly removed and brought back to SEA headquarters in preparation for the next task.

Anti-submarine warfare (ASW) is of paramount importance for navies across the globe and these exercises will clearly demonstrate the role of low cost ASW technology in enabling navies access to effective and miniaturised ASW technology. Not only does this boost the capabilities of those with established ASW systems, but it also allows those with smaller platforms and budgets to utilise this critical technology.

Stand S8-120 at DSEi
SEA unveils Trainable Decoy Launcher System

SEA has launched a trainable decoy launcher system to counter threats posed by hypersonic and multimode seeker heads.

With the speed of missiles increasing and the window in which the surface platform can respond becoming very small, surface platforms require the ability to rapidly and accurately place decoy payloads to maximise their effectiveness.

The Trainable Decoy Launcher System is capable of a wide range of movement, rapidly delivering complex patterns of mixed decoys around the platform. It offers a sophisticated threat processing engine, which can recommend and enact responses to a wide range of threats much more quickly than traditional systems, minimising the need to manoeuvre the ship.

Delivered through a Cohort partnership

The Trainable Decoy Launcher is being delivered through a partnership with fellow Cohort businesses, Chess Technologies and MASS.

The Trainable Decoy Launcher is available in a range of flexible configurations, it has support for 130mm and other decoy types, including:

- Chaff
- Flares
- Active rounds
- Expendable torpedo countermeasures
- Rocket/mortar, and mortar launched sub munitions
- Programmable rounds

The system is designed for global operation in a range of military environments. Other features include:

- Configurable ergonomic round loading
- No deck penetration
- Small deck footprint
- Low weight
- Uses proven SeaGnat barrels, interchangeable with existing systems
- Modular construction
SEA partners with iXblue to launch anti-submarine surveillance system

SEA has developed an all new long endurance, rugged, autonomous, underwater anti-submarine surveillance system, SeaDrix™ in partnership with iXBlue. Initially developed for the Ministry of Defence’s Dstl Progeny Task 13, the system will be deployed in October 2019.

SeaDrix™ combines SEA’s low-profile acoustic sensor, KraitArray™, with iXBlue’s autonomous surface platform, Drix, to create a system that can operate for up to ten days unrefuelled with an at-sea refuelling system. Development of a five-month endurance option is underway. The integration of the two technologies results in a system that will allow naval forces to complete surveillance missions without the need to rely on military vessels and support teams being in the immediate area.

As well as its long endurance capabilities and rugged design, SeaDrix™ is modular, coming with standalone mission planning, collision avoidance, sonar processing and situation awareness systems, and can operate with additional SeaDrix™ or other manned/unmanned systems.

SEA can now offer complete modular ASW solutions – ‘ASW in a box’.

This solution delivers packages to suit operational needs, built from the following elements: Lightweight ships passive sonar system; Lightweight active sonar solution enhancing passive capability above; Autonomous ASW system (SeaDrix™); Lightweight UW decoy launcher system and Lightweight torpedo launcher system, both complete with control system and interfaces with any/all of the above.

OUR PARTNERSHIP

The partnership with iXblue combines the KraitArray™ with Drix. KraitArray™, SEA’s thin 16mm modular array that detects acoustic signatures from underwater contacts is attached to iXblue’s Drix, a surface platform with a wave piercing hull that acts as a stable towing platform to offer a persistent autonomous antisubmarine surveillance system.

Steve Hill, Managing Director of SEA said: “We’re delighted to have partnered with iXBlue to develop our latest sophisticated autonomous anti-submarine surveillance capability, SeaDrix™.”

Commenting on the partnership, iXBlue said: “This is an exciting development. Bringing safety and efficiency to the warfighter, the unique combination of SEA’s KraitArray™ and our autonomous surface platform Drix brings a new, durable anti-submarine surveillance capability to naval forces around the world.”
ASW Training Packages

SEA has bolstered its anti-submarine warfare (ASW) offering with the introduction of a tailorable ASW training service, complementing SEA’s innovative Krait Defence System to provide a complete ASW solution.

The tailored training service is comprised of four distinct packages: ASW Theory/ Knowledge/ Awareness; Collective Command; Individual Equipment Operator and Individual Equipment Maintainer.

Package one, which focuses on knowledge, will be tailored to the needs, experience and knowledge of the customer and can be delivered in a classroom or accessed online. The second package, which we will be demonstrating at DSEi, enables users at all levels of the command chain to train interactively using real applications in a simulated environment. The remaining packages are focused on the sonar operator and maintainer.

The Collective Command/Team Training section of the training service uses the latest simulation technology to provide realistic tactical ASW scenarios that are relevant to the customer’s specific area of operation, force mix and potential threats.

Packages three and four are an off-the-shelf blend of appropriate training media aimed at specific operation roles. These packages can be delivered either in a classroom environment or accessed online while deployed on operations. The cutting-edge training software is delivered in partnership with Antycip simulation, who has provided the software licence for VT MAK’s VR-Forces Computer Generated Forces (CGF) platform. This will generate the tactical scenario for the Collective Command / Team Trainer package of the service.

SEA is a Single Provider Solution

In launching the tailorable ASW training service, SEA becomes a single provider of a complete ASW solution covering training and equipment provision. The system utilises the latest training and simulation technologies, including Accessible training media and is designed using a UK systems approach to training. The system provides realistic and operationally relevant training scenarios, tailored to an individual’s requirements and level of experience.

The design and delivery of the four distinct training packages builds upon SEA’s established pedigree and significant experience in ASW and sonar systems equipment and operations. Using this experience, SEA’s knowledgeable staff are able to deliver training to students and through the exclusive Train the Trainer programme – enabling SEA to deliver training worldwide.

“Launching a cutting-edge ASW training system enables us to be a single provider for equipment and training equipment. The system is exceptionally realistic and also provides operationally relevant training scenarios.”

Steve Hill, Managing Director
SEA has an established pedigree in soldier systems research and experimentation for Close Combat. It is a lead industry partner for Defence Science and Technology Laboratory (Dstl), Army HQ and DE&S and has successfully delivered a number of Close Combat (DCC) research programmes over the last 10 years. SEA prides itself on delivering high risk, high reward research in the close combat and soldier systems domain. This has been achieved through funded programmes such as: Delivering Dismounted Effect (DDE), Future Dismounted Close Combat (FDCC), Platoon Combat Experiment (PCE), Dismounted Situational Awareness Experimentation and Integration and Future Individual Lethality System (FILS).

SEA operates on a Systems Thinking approach based on independence and a strong understanding of the military capability requirements so that research plans can be developed to meet the requirements ensuring the delivery of research that stands up to scrutiny and supports the development of capability for the frontline user.

SEA applies systems engineering for complex systems to the development of soldier capability, with the human at the centre of the system. This is built on the foundation of user requirements and developed through the use of Use Case analysis, application of system architectures and rapid prototyping/modelling to enable experimentation.

Increasing equipment complexity and the digitisation of the soldier can compromise operational performance due to a lack of integration and the resulting increase in physical and cognitive burden. SEA brings a systems-based approach to development and integration of technologies to deliver capability to the soldier. This focuses on understanding the system within which the soldier operates and ensuring a cohesive, coordinated design ethos throughout development and integration tasks.

SEA’s innovative systems based approach to research and capability development enables a complex system to be successfully integrated into an advanced equipment capability. Through systems integration, the capability delivers over and above the sum of its parts. It ensures that the equipment delivered to the soldier enables them to maintain fightability throughout operations and achieve their operational objectives.

Future Soldier

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SEA in the News

2019 has been an extremely successful year for SEA. Read our latest news, highlighting exciting developments and collaborations that extend our services and global reach.

DARONMONT
Wholly Australian-owned defence company, Daronmont Technologies has launched a training and simulation centre as part of its technology and knowledge transfer partnership with SEA. In place at the new facility is SEA’s leading training solution DECKsim which provides an immersive 3D training experience for Flight Deck military personnel. Providing real-life scenarios, the simulator can incorporate any desired combination of airfield or ship flight deck, aircraft, approach/departure waypoints and importantly, emergency procedures in a controlled and safe environment.

MALAYSIA
SEA has been granted approval by the Malaysian Investment Development Authority (MIDA) to extend its regional office in Kuala Lumpur until 2022. The company’s innovative defence solutions have been widely adopted across the region, including its weapon-agnostic Torpedo Launcher System, which is currently in use by three navies due to its ability to launch NATO standard calibre weapons. Through its Kuala Lumpur office, SEA supports customers which have adopted its decoy launchers, integrated communications systems, anti-submarine warfare (ASW) capabilities and training & simulation solutions.

ASW TRAINING
SEA is launching its new Anti-Submarine Warfare (ASW) Training package at DSEi 2019. The web-based solution brings together a combination of interactive video and simulation techniques which can be tailored to specific operations in classroom or remote situations. Additionally it allows for collaborative training on multiple platforms enabling teams to train in dynamic scenarios at command and operator level. By blending simulation and real equipment training can take place against defined scenarios at any time and allows for ease of Maintainer training.
SEA around the World

We have an extensive exhibition and conference schedule planned for the next few months. Where ever you are in the world, we look forward to meeting you at the following events.

- **DSEi 2019**
  - London
- **Defsec 2019**
  - Halifax
- **Pacific 2019**
  - Sydney
- **D&S Thailand 2019**
  - Bangkok
- **UDS 2020**
  - Southampton
- **UDT 2020**
  - Rotterdam
- **Cansec 2020**
  - Ottawa
- **Future Surface Fleet 2020**
  - Portsmouth
HMS Oardacious Sponsorship

SEA, together with Cohort plc, MASS and MCL is delighted to announce their support as Silver Sponsors for HMS Oardacious.

A team of four Royal Navy Submariners will take part in the world’s toughest rowing race, the Talisker Whisky Atlantic Challenge in December 2019. The team - Lieutenant Hugo Mitchell-Heggs, Lieutenant Callum Fraser, Petty Officer Dylan Woods and Leading Engineering Technician Matthew Harvey - is taking part in the 3000-mile unsupported row across the Atlantic Ocean to mark 50 years of Continuous At Sea Deterrent (CASD), during which time there has always been a Royal Navy Ballistic Missile Submarine at sea providing the nation’s deterrent.

Cohort’s sponsorship will help the team’s ambitious goal of being the first to cross the finishing line in Antigua in January 2020. Most importantly the sponsorship will support the team’s aim to raise £100,000 for its chosen charity, The Royal Navy and Royal Marines Charity (RNRMC), to provide mental health and well-being support to Royal Navy Submariners.

Cohort has strong links and an extensive history with the Royal Navy. For example, SEA’s Krait Defence System is a complete ASW solution for smaller vessels, while both SEA and EID offer a range of naval communications systems. In addition to the Group’s defence technology specialty, many of its employees have previously served in the armed forces.

Cohort CEO, Andrew Thomis said: “The Cohort Group is immensely proud to be supporting HMS Oardacious for the Atlantic Challenge and I applaud the team’s bravery and determination to be the first boat to cross the finish line. We have all been struck by the team’s passion for the RNRMC and their aim to create a tangible legacy in mental health support.”