

Marine Sciences professional services extend overseas in support of the International Ship and Port Facility (ISPS) Code. Ship and Facility Security Assessments, Plans and Training have been provided to owner/operators of container ships, bulk carriers, passenger ferries, and tankers from over 50 countries. Professional services provided to military clients include the development of littoral and deepwater CONOPS for the Navy and USCG. MMS has also been the principal author on technical reports and presentations.

Multi-Electronique

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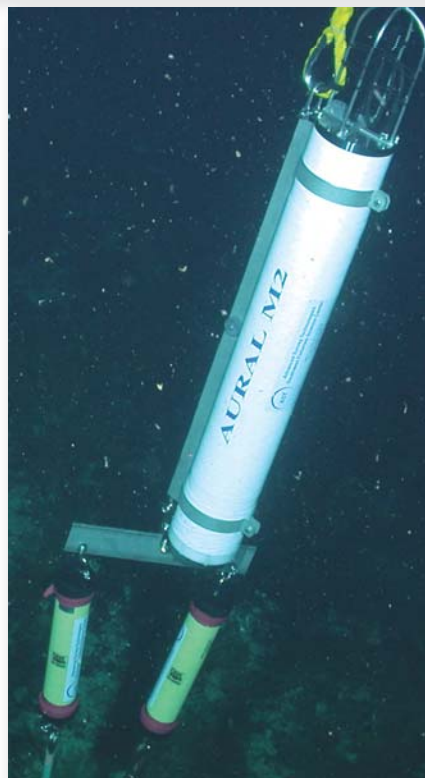
CEO: Jacques Saint-Pierre

Facility: Located in the Quebec maritime center on the shore of the St-Lawrence River

Employees: 12

Founded in the early 1980s, Multi-Electronique, as its name indicates, is an active firm in the electronic field. The firm activities are centralized in the repair business, but also include the design and manufacture of electronic equipment. Over the years, its work has given the firm the opportunity to develop an expertise in the oceanographic equipment field.

Technology Profile: The AURAL is designed to record underwater sounds, pressure and water temperature over a period up to a year with total autonomy. Two pieces of software included with the device are intended to configure it and retrieve embedded information in the recordings after deployment. The AURAL is available in three lengths for short, medium and long deployment (respectively 16, 64 and 128 batter-



MSI (Materials Systems Inc.)

543 Great Rd., Littleton, MA 01460 USA

Tel: (978) 486-0404 • Email: info@msitransducers.com • www.msitransducers.com

President: Dr. Leslie Bowen • VP: Gerald Schmidt

Facility: MSI's facility houses R&D, Manufacturing, and Sales and Marketing. Manufacturing includes equipment for making and injection molding piezoelectric ceramic, piezocomposite fabrication, transducer assembly and encapsulation, and in-water tank testing.

Testing Capabilities: In water acoustic testing, pressure, temperature, impedance

Employees: 35

MSI (Materials Systems Inc.) designs and manufactures custom sonar transducers and arrays for harbor defense, side-scan, obstacle avoidance, sub-bottom profiling, swath bathymetry, mine hunting, swimmer detection, and acoustic communications. MSI personnel

participated in the earliest work on piezocomposites in the late 1970's, when the performance benefits were first demonstrated under ONR and DARPA funding. Since then, MSI has developed injection molding techniques for mass-producing these transducers. MSI's development of injection molding for manufacturing piezocomposite opened the way for application of this acoustic transducer material in sonar and ultrasound. During the past 18 years, MSI has provided high performance piezocomposite transducers for the U.S. Navy and a variety of other defense and commercial clients. MSI is now in full scale production for a variety of commercial and industrial customers. MSI is ISO 9001 certified. Technology Profile: MSI's piezocomposite arrays are designed to deliver broad bandwidth, allowing multiple beams to operate in distinct frequency bands. This should allow greater resolution and enhance broad spectrum (chirp) operating techniques. MSI's piezocomposite arrays can also be curved and shaded to achieve a specific beampattern or to achieve a hydrodynamic profile when mounting the arrays to the curved hull of a vessel or AUV. Resonant transmit designs are in production at frequencies ranging 20 kHz to 1MHz. MSI's piezocomposite arrays have been shown to meet full explosive shock requirements for Navy operations in both the US and UK, and can be configured for full ocean depth performance. MSI's piezocomposite array technology is providing major performance and cost benefits to many of the latest commercial and defense imaging systems, including Teledyne Benthos' C3D multibeam sidescan sonar and the US Navy's Archerfish vehicle for the Airborne Mine Neutralization System (AMNS).



ies). Other notable Multi-Electronic products include the Instrumental Oceanographic Buoy, Winch Counter, Underwater Camera, Bionet, and Vertical Net.

NortekUSA

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 General Manager: Eric Siegel

NortekUSA, a subsidiary company of Nortek AS, was formed in 1998 to provide sales and technical support for the Nortek acoustic Doppler current meters, profilers and velocimeters used to measure currents and waves in the ocean, lake, river and laboratory. The NortekUSA office is located in the maritime community of Annapolis, Maryland and provides



customer support and technical services for clients in the western hemisphere, particularly the US and Canada. The subsidiary also assists its parent company in product development. NortekUSA provides technician staff in the Annapolis office and technical sales representatives on the East Coast, West Coast, and Gulf communities.

Ocean Server Technology

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 President: Bob Anderson

OceanServer Technology, Inc. is a privately held company, established in 2003 to develop product solutions for embedded and OEM applications. OceanServer's battery-based



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 Sales Manager: Geevarughese George
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 Engineering Director: Dr. Kostyantyn Kebkal



Dr. Rudolf Bannasch



EvoLogics was founded in 2000 in Berlin, Germany, by a group of scientists and R&D experts to develop technology for the aerospace, maritime and offshore industries through interdisciplinary cooperation between engineering and life sciences. The company specializes in underwater acoustics, including systems for data transmission, surface mapping, and positioning. The company has also worked intensively in other fields of bionics, developing technologies and applying new concepts in mechanics, systems integration, electronics and robotics.

Technology Profile: EvoLogics manufactures S2C modems based on Sweep Spread Carrier signal processing (S2C) derived from eight years of study on the physics of dolphin communication. This patented technology is designed to allow the modem to act under dynamic environments and where there are a significant number of obstacles to signal transmission like noise and close surfaces. By distributing the signal across a wide spectrum, the modem is designed to interpret and collect signals in spite of interference. The control mechanisms of the protocol and the processors on board the modems were also developed to allow for out-of-order transmission, prioritization of information and multiple data channels, making the underwater link transparent to the end user. Spreading the signal along a wider spectrum than other modems also opens other interesting possibilities, like the low probability of detection of the signal since beyond a certain distance it falls below the noise level. However, the signal still can be identified by another modem on the other end of the communication. This successful and reliable modem has been extended into USBL solutions that allow reliable positioning along with data communication. Full duplex communication adds to the versatility of the product. The product range can achieve a data rate of up to 33 kbits/ sec and cover distances of over 8000m, with low power consumption.