

## Melodi reinvents the exploration of marine resources

The project at the cutting edge of innovation and hi-tech robotics is called Melodi: "Magnetic and Electromagnetic Ore Detection." It aims to reinvent the exploration of marine resources - a major challenge going forward.

Jointly developed by ECA Group in a consortium with CreOcean, DCNS and RTSys, the new exploration system is intended to optimize the mapping of major underwater areas and the magnetic detection of a specific type of mining resources. This is all done quickly and accurately, with no environmental impact and at a lower cost.

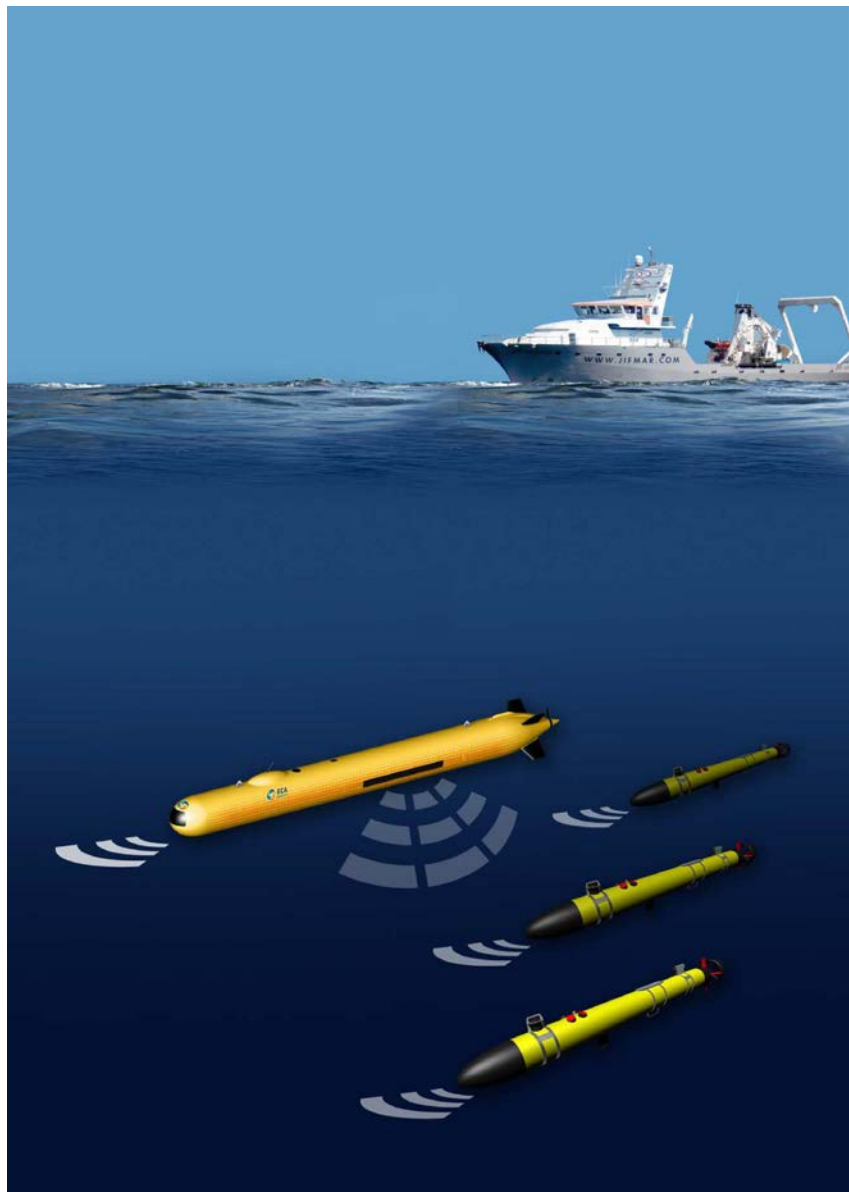
"Melodi involves explorations using [Autonomous Underwater Vehicles \(AUV\)](#) based on the principle of hunting in packs to locate ore deposits," explains François Falcou, research director at ECA Group (Toulon), a global specialist in robotics and engineering related to complex systems in hostile environments. "Equipped with innovative capabilities and embedded intelligence, AUVs can explore depths greater than 2,000 meters, recharge without going back up to the surface, communicate with each other and conduct programmed collaborative missions," he adds.

In this underwater exploration mission, the ECA Group's [AUV](#) serves as the "pack leader": it leads the mission and guides the path of some ten other following AUVs (developed by RTSYS). The pack thus formed needs only 24 hours to map an area of 100 km<sup>2</sup> and collect the data required to identify the geological facies potentially rich in ore deposits. That makes it possible to proceed to the next steps and to analyze whether mining is viable and profitable, before carrying out drilling.



"We know that massive marine mineral resource deposits exist and that they hold higher concentrations of rare and precious metals than onshore deposits. However, current exploration techniques (complex, expensive and destructive to the ecosystem) are incompatible with the exploration performed at the industrial level... Within this framework, Melodi represents a real game-changer," says ECA Group.

The change is also a highly strategic one for France, the world leader in terms of marine mineral resource deposits whose mining would reduce its dependence on imports and secure its supply in metals, for which global demand is constantly growing.



## About the consortium

At a total cost of €4.5 million, Melodi's research project is collaborative, based on the combination of three independent and complementary research projects:

**Messidor**, the dominant party, winner of the 2015 World Innovation Competition (CMI), enabling the magnetic detection of sites bearing sulfide deposits\*

**Doremi**, enabling 3D characterizations of the type and volume of marine resources, and

**Docking**, which supplies AUV hosting infrastructures.

Four French companies, grouped together in a consortium, participate in Melodi:

**ECA Group** a specialist in underwater robotics and acoustics, the automation, design, development and integration of remote-operated systems in hostile environments;

**Creocean** a specialist in oceanography, winner of the World Innovation Competition (CMI) for the Messidor project and consortium leader;

**DCNS** the European leader in naval defense and a specialist in renewable marine energies, winner of the World Innovation Competition (CMI) for the Subsea Watcher environmental monitoring project; and

**RTSys** a specialist in active and passive underwater acoustics and in UAVs.

This consortium also draws on the expertise of three subcontractors specialized in underwater measurement applications: **MAPPEM**, **CADDEN** and **IPGP**.

For the second phase of risk reduction (2015-2017), Melodi enjoys the support of BpiFrance Financement in the World Innovation Competition (CMI), a French government program that selects the best innovation projects managed by companies creating wealth, exports and employment in France.

\*AUV (Autonomous Underwater Vehicle)

\* Sulfide deposits (Volcanic rocks containing variable quantities of different types of metal)

\*CMI (Concours Mondial d'Innovation – World Innovation Competition)

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#### ECA Group

The ECA Group is renowned for its expertise in robotics, automated systems, simulation and industrial processes. Ever since 1936 it has been developing complete innovative technological solutions to perform complex missions in hostile or restrictive environments.

Its products are used by a demanding international clientèle requiring the highest levels of safety and efficiency, mainly in the sectors of defence, maritime, aerospace, simulation, energy and industrial equipment.

In 2015, the Group reported revenue of 105.2 M€ for its three Departments: Robotics, Aerospace and Simulation.

ECA Group is a Groupe Gorgé company.

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