



## NETWORK DEPLOYMENT TESTING OF UNDERWATER COMMUNICATIONS

# TASM PLATFORM

Underwater acoustic transmission

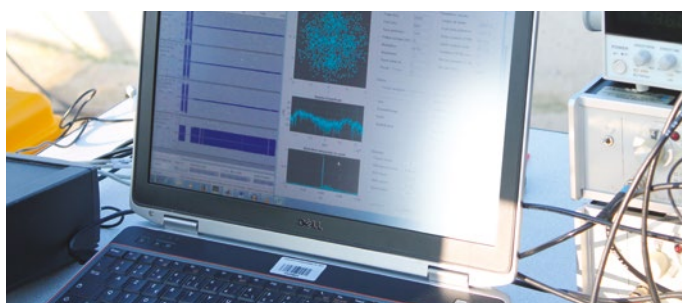


**IMT Atlantique**  
Bretagne-Pays de la Loire  
École Mines-Télécom

The purpose of the **TASM (Sub-marine Acoustic Transmission)** platform is to study and evaluate underwater acoustic communication systems. The purpose of underwater acoustic communication is to transmit underwater information by acoustic link, allowing ships, submarines and underwater drones to communicate all types of digital data (text, images, telemetry). The design of robust underwater acoustic links should enable a technological breakthrough in the years to come. Indeed, communication with autonomous underwater UAVs or non-wired observatories will only be possible if wireless communication exists. The only wireless link currently capable of transmitting data underwater over long distances uses acoustic waves. Several modems are commercially available. However, the robustness, throughput, range and power consumption can be improved to provide reliable communications systems for the deployment of underwater communications networks. It is with this objective in mind that the CACS/COM team of the Lab-STICC laboratory has decided to develop a test platform to test research results for underwater acoustic communications.



Equipment  
for  
experimentation  
in the field



> A real-world test platform

The IMT Atlantique underwater acoustic platform has been given the Carnot Telecom & Digital Society label for environmental observation and surveillance (OSE). IMT Atlantique has invested financially from its own funds and through subsidies in the purchase of equipment specific to this field of study and experimentation. This investment takes the form of equipment, such as generators, transducers and cables, power amplifiers, conditioning boxes, acquisition boxes, and hydrophone antennas. So IMT Atlantique can conduct measurement campaigns and develop related algorithms autonomously.

This investment has given IMT Atlantique the tools needed to develop its own field expertise.

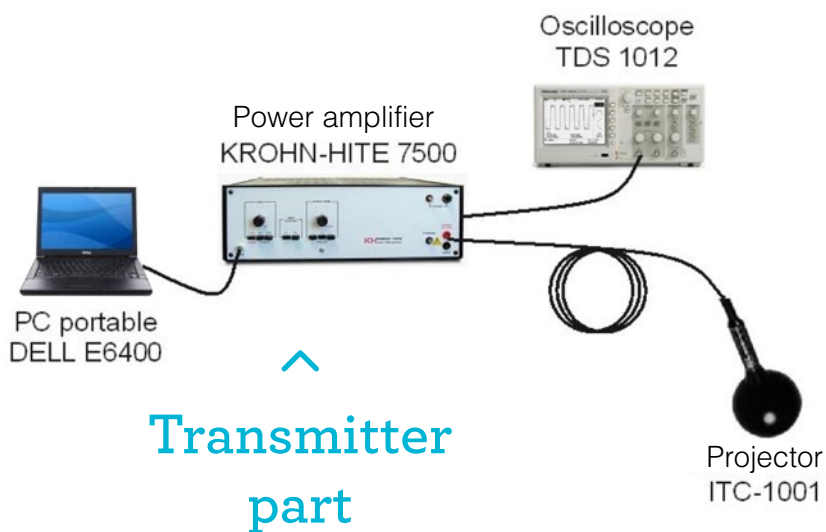
The acquisition of a test platform make it possible to be autonomous in research activities and in testing innovative technical solutions, thus maintaining and increasing the expertise acquired in this field. This full-scale testing approach is essential because only real trials at sea can validate the concepts studied.

The test platform is made up of several facilities financed by the Brittany Region, the Finistère General Council, Brest Métropole, Lab-STICC and IMT Atlantique.

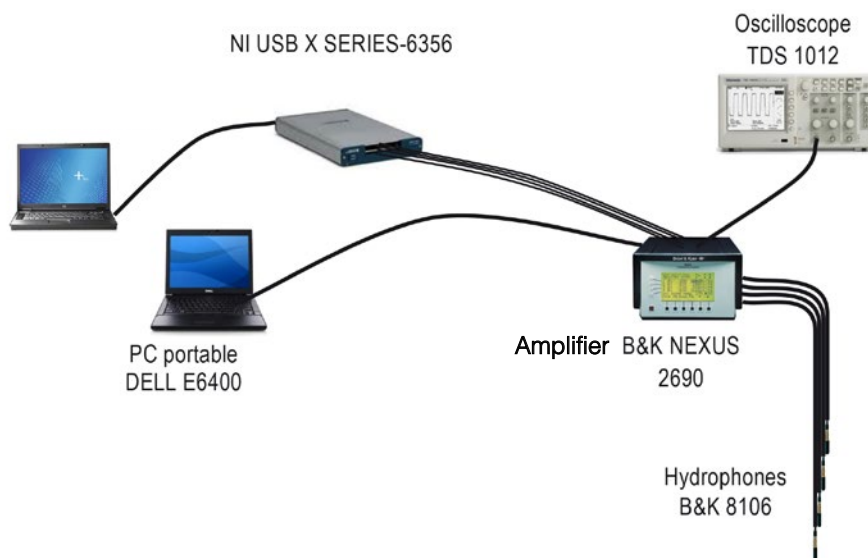
# What we offer

## Measuring and experimental equipment:

- > 1 power amplifier B&K 2713
- > 1 transducer ITC 1001
- > 1 transducer ITC 1035
- > 4 reception hydrophones B&K 8106
- > Receiving amplifier 4-way B&K Nexus

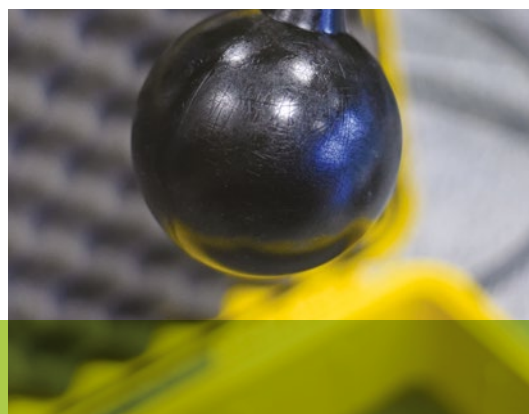


## Receiver part



# A platform linked to other projects

- **TRIDENT acoustic communication platform** : DGA (French Directorate General of Armement), in collaboration with SERCEL for hardware aspects (transducers, amplifiers, etc.) and IMT Atlantique for signal processing (synchronization, equalization, error correction coding, etc.).
- **ROSE project** (Wreck Monitoring Oriented Network) supported by Ifremer.
- **Haliodstar project** (Alistar underwater robot) managed by ECA, a CIFRE thesis with Thales Underwater Systems, and several other theses funded by the Brittany region through the FUI COMET and CANOPUS projects.
- Through the **Pôle Mer Bretagne** (Brittany Sea Cluster) projects funded by the FUI and the Brittany Region, IMT Atlantique was in charge of providing the underwater acoustic communication link in the «**COMET**» and «**NemoSens**» projects with RTsys and «**CANOPUS**» with IxBlue about acoustic communication networks.
- Several theses through industrial collaborations with Thales, RTsys, Sercel, etc.
- **Collaborations within the framework of research visits or publications** with several international research units (Massachusetts Institute of Technology, Northeastern University, Woods Hole Oceanographic Institute, Missouri University of Science and Technology, National University of Singapore, University of York, etc.).
- **The scientific expertise** of our team in this domain is internationally recognized: Christophe Laot and François-Xavier Socheleau are listed in the editorial of the IEEE Journal of Oceanic Engineering as «Outstanding Reviewers» in 2013-2014, 2017 and 2019.



## Discover the platforms



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