

Abstract**Optimised acoustic detection system for detecting various underwater threats in a sensitive zone**

What is proposed is an acoustic detection system for detecting at least partly submerged
 5 targets in a sensitive area defined with respect to an infrastructure, the detection system
 comprising at least one multistatic detection group, each multistatic detection group
 defining a detection area, and comprising:

- A submerged transmitter (31) emitting at low frequencies;
 - A plurality of submerged receivers (32) comprising at least two receivers, each
 10 receiver of a given group forming, with the transmitter of the group, a bistatic pair,
 each bistatic pair generating an elementary detection area (320) surrounding a
 blind zone (321), the detection area of the group being formed by all of the
 elementary detection areas of the receivers of the group, said receivers being
 arranged in at least one layer.
- 15 For at least one group of the system, the form described by the receivers of at least one
 layer of the group is an at least partly circular form of given radius (R), the inter-receiver
 distance ($2a$) between two adjacent receivers of the layer depending on the distance (D)
 between the transmitter (31) of the group and the rectilinear segment linking the adjacent
 receivers of the layer, called reference transmitter-receiver distance.

20 (Figure 6)