CLAIMS

1. A sonar system comprising:

a sonar device intended to be towed by a surface ship and comprising a tow cable and a set of at least one towed device, comprising a towed body, intended to be towed by the surface ship via the tow cable , the towed body being elongate along a longitudinal axis from a first longitudinal end of the towed body as far as a second longitudinal end of the towed body, the towed body incorporating a first linear acoustic antenna comprising a plurality of electroacoustic transducers substantially aligned along the longitudinal axis, the towed device being configured and connected to the tow cable in such a way that the towed body is able, when it is being towed and is fully submerged, to exhibit an orientation in which the longitudinal axis extends substantially along a vertical axis defined by the force of gravity, at least one towed body of the set of at least one towed device being connected to the tow cable by a first hanger and a second hanger of substantially the same length, a first end of the first hanger and a first end of the second hanger being connected to the tow cable and a second end of the first hanger being attached to the towed body at a fixing point of the towed body, which point is situated near the first longitudinal end, and a second end of the second hanger being attached to the towed body at a second fixing point secured to the first fixing point and situated near the second longitudinal end, and

a handling device intended for launching and recovering the sonar device from the surface ship, the handling device comprising a winch comprising a first drum able to rotate about a first axis of rotation to wind the tow cable onto the first drum, wherein the handling device comprises a set of at least one convex deflector having the overall shape of a portion of a cylinder extending longitudinally along an axis of the deflector, the deflector being arranged in such a way as to extend substantially horizontally, in a calm sea state, and substantially perpendicular to a vertical plane substantially parallel to an axis of the traction applied to the tow cable by the handling device during a first step of winding during which the first drum is rotationally driven about the first axis so

that the tow cable is wound onto the first drum and so that the first hanger and the second hanger come to bear against the deflector so as to be deflected by the deflector so that the longitudinal axis of the towed body is oriented substantially parallel to the axis of the deflector when the towed body is fully emerged and suspended from the first hanger and from the second hanger.

2. The sonar system as claimed in claim 1, wherein the first hanger and the second hanger each have a fixed length.

3. The sonar system according to either one of the preceding claims, wherein the second end of the first hanger is attached to the first longitudinal end of the towed body and the second end of the second hanger is attached to the second longitudinal end of the towed body.

4. The sonar system as claimed in any one of the preceding claims, comprising a flexible elongate body of substantially neutral buoyancy intended to be towed by the tow cable and comprising a second acoustic antenna comprising a plurality of electroacoustic transducers distributed along the flexible elongate body, the flexible elongate body being connected to the tow cable via the set of at least one towed body, the towed body being connected to the flexible elongate body in such a way that the flexible elongate body applies traction to the towed body at a third fixing point situated near the first longitudinal end of the towed body and a fourth fixing point situated near the second longitudinal end of the towed body.

5. The sonar system as claimed in the preceding claim, wherein at least one towed body of the set of at least one towed body is connected to the flexible elongate towed body by a third hanger and a fourth hanger, a first end of the third hanger being attached to the towed body at a third fixing point situated near the first longitudinal end of the towed body and a first end of the fourth hanger being attached to the towed body at a fourth fixing point situated near the second longitudinal end of the towed body.

6. The sonar system as claimed in the preceding claim, wherein the set of at least one towed body comprises a single towed body or a plurality of towed bodies.

7. The sonar system as claimed in the preceding claim, wherein the set of at least one towed body comprises a plurality of towed bodies, the sonar device comprising at least one line joining together two towed bodies of the set and comprising at least one electroacoustic transducer.

8. The sonar system as claimed in any one of the preceding claims, wherein the towed device is the towed body.

9. The sonar system as claimed in claim 1, wherein the axis of at least one deflector of the set is substantially parallel to the first axis of rotation.

10. The sonar system as claimed in any one of the preceding claims, wherein at least one deflector of the set of at least one deflector is arranged in such a way that, during the first winding step, the first hanger and the second hanger are able to come to bear against the deflector, when the towed body is fully immersed.

11. The sonar system as claimed in any one of the preceding claims, wherein the set of at least one deflector comprises at least one deflector arranged upstream of the first drum, viewed from the first hanger and from the second hanger initially immersed, during the first winding step.

12. The sonar system as claimed in any one of the preceding claims, wherein the winch comprises a set of at least a second drum surrounding the first drum and able to rotate with respect to a frame of the winch about a second axis of rotation substantially parallel to the first axis of rotation, the winch being able to be in an uncoupled state in which the first drum and the second drum

are uncoupled in terms of rotation about the first axis of rotation and about the second axis of rotation, so as to allow the tow cable to be wound onto the first drum during the first winding step during which the first drum is rotationally driven about the first axis, the second drum being able to be in an open state in which the second drum exhibits a receiving opening through which the towed body is able to pass during the first winding step in order to enter a volume surrounding the first drum and which is surrounded by the second drum, the winch being able to be in a coupled state in which the first drum and the second drum are coupled in terms of rotation about the second axis of rotation so as to allow the flexible elongate body to be wound about the second axis of rotation during a second winding step during which the second drum is rotationally driven about the second axis.

13. The sonar system as claimed in the preceding claim, wherein the second drum is able to be in a receiving angular position, about the second axis with respect to the frame, in which position the tow cable and the towed body pass through the receiving opening during the first winding step.

14. The sonar system as claimed in any one of the preceding claims, wherein the handling device is configured to implement the following step during a method of recovering the initially immersed sonar device: the first winding step during which the first drum is rotationally driven about the first axis so that the tow cable is wound onto the first drum and so that the first hanger and the second hanger come to bear against the deflector to be deflected by the deflector so that the longitudinal axis of the towed body is oriented substantially parallel to the axis of the deflector, when the towed body is fully emerged and suspended from the first hanger and from the second hanger.

15. The sonar system as claimed in the preceding claim insofar as that is dependent on claim 13, wherein the handling device is configured to implement the first winding step until the towed body enters the volume delimited by the second drum through the receiving opening, and then a second winding step

during which the second drum of the handling device, which is in the second state, is rotationally driven about the second axis of rotation so as to wind the flexible linear body onto the second drum.