

# Ordnance Automatic Recovery System



## Introduction

Ordnance Automatic Recovery System (OARS) is a further development of the operationally proven bag system that is in-service with various NATO Navies. The new Ordnance Automatic Recovery System incorporates lightweight 300 bar composite cylinders resulting in significant savings in both weight and size.

## Development Background

In diving operations it is not always possible to dispose of unexploded ordnance in the position where it is found. For safety reasons a means of remotely lifting ordnance from the seabed for removal to a suitable area, together with means of lowering the ordnance in a controlled manner for disposal is therefore essential.

Standard lifting bags are a lightweight low cost means of lifting unexploded underwater ordnance. The ability to inflate a bag on site from an integral compressed air supply provides a versatile method of lifting that is widely accepted in Explosive Ordnance Disposal diving operations. However, a limitation of standard lifting bags is the tendency to accelerate towards the surface out of control. This can result in the dumping of gas at the surface and the unexploded ordnance rapidly descending to the seabed with potentially disastrous consequences. Conversely, if an air filled lifting bag starts to sink, its volume decreases with increasing hydrostatic pressure, the lift forces reduce and the rate of descent rapidly increases resulting in unexploded ordnance landing uncontrolled onto the seabed, again with potentially serious consequences.

## Unique Operational Capability

The purpose of the Ordnance Automatic Recovery System (OARS) is to provide a safe and reliable means of remotely lifting ordnance of up to 1000 kg mass from depths down to 80 meters by providing a time delay and controlled buoyancy facility. There are two versions of OARS, one with a lifting bag of 500 kg capacity and one with a lifting bag of 1000 kg capacity. Each consists of two main assemblies:

- a. Lifting bag assembly with integral valise
- b. Cylinder Pack and Time Control Unit

Operation of the OARS requires the Cylinder Pack (with charged cylinders suitably configured for the proposed lift) and the Timer/Controller Unit to be attached to the Lifting Bag Assembly. Once the actuation delay period has been set on the surface using the remote setting control box, the assembly is deployed in the water and positioned for attachment to the item to be lifted.



1000 kg OARS with remote acoustic activation system.

When OARS has been attached by the two lifting straps, or if preferred rearranging the two straps to form a single point, the two quick release plastic buckles on the lifting bag that secure the valise are released and the ascent arming pin is removed from the Timer/Controller Unit. Actuation then occurs after the pre-set delay period. The lifting bag is inflated by the opening of the solenoid valve in 10 kg bursts in conjunction with a microprocessor controlled pneumatically operated dump valve to give a controlled ascent rate of 2 +/- 0.5 metres per second.

Similarly, when the OARS is on the surface, it may be used to lower an item at a controlled rate of descent. This is achieved by removing the descent arming pin adjacent to the pneumatic dump valve at the top of the inflated lifting bag. Actuation then occurs after a five minute delay period; the pneumatic dump valve is opened to deflate the lifting bag to give a controlled descent rate of 2 +/- 0.5 metres per second.

The 500 kg and 1000 kg versions of OARS are essentially the same, the differences being in the size of the lifting bag and the number of cylinders in the cylinder pack:

The optional Tidal Lift Kit may be used with the 500 kg OARS, or with the 1000 kg OARS in two cylinder configuration, to enable the Delayed Inflation Unit to be separated from the Lifting Bag Assembly enabling remote lifting from a beach on a rising tide. The Tidal Lift Kit consists of the following:

- 1 A 5 metre long sheathed 'umbilical' containing:
  - a) An 'intelligent' six pin electrical cable.
  - b) An inflate air hose.
  - c) A dump valve air hose.
- 2 Pair of buoyancy blocks for attachment to the carrier frame of the Delayed Inflation Unit.
- 3 Pair of webbing straps to attach the buoyancy blocks to the carrier frame of the Delayed Inflation Unit.

The OARS is a thoroughly proven system which has been in service with various Navies for many years.



Two cylinder pack complete with 500 kg lifting bag (stowed) and microprocessor module.



## Order Codes

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500 kg OARS c/w Transport Case TL201AB	1000 kg OARS c/w Transport Case TL200AB	Tidal Lift Kit TL172
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