

*Introducing*

**Fiobuoy<sup>®</sup>**



**a submersible marine  
marker buoy  
and retrieval system**

*from*

**Fiomarine Industries Pty. Ltd.**

ACN 074 357 869



# Fiobuoy®

**Concept Overview** The **FiOBUOY®** is a submersible marine marker buoy and retrieval system which is designed to release itself from its underwater mooring at either a predetermined time and date or by Acoustic Command, and ascend to the surface to fulfil its marking function.

The product was developed for the principal purpose of removing from the marine environment, surface protrusions which, particularly under night conditions and in other circumstances where there is poor visibility, become hazardous to marine navigation. In addition to its marking function, the device facilitates access to submerged objects at specific times by permitting those objects to be retrieved via its connecting tether, rather than deploying diving personnel.

The process of ascent occurs as a result of positive buoyancy. The release mechanism built into the buoy is an electro-mechanical device controlled by an on-board computer. The computer is initially programmed by a Deck Control Unit which sets the desired parameters on which the release is to occur. This pre-deployment communication link between the buoy and the Deck Control Unit is via an infra-red link signal and is security coded. The programming function can also be undertaken by either a standard desktop or laptop computer (ie. a PC).

The **FiOBUOY®** is constructed with a 'zero leaks' philosophy. Therefore, communication between the Deck Control Unit and the internal electronics is accomplished via infra-red light actually transmitted through the casing. This method was selected over conventional plugs and sockets which not only leak, but also corrode in a harsh marine environment.

For the same reason, there is no ON/OFF switch on the **FiOBUOY®**. Instead, the **FiOBUOY®** spends most of its serviceable life in what we call '**Sleep**' mode. When 'asleep', very little power is consumed, and this allows for very long battery life.

The **FiOBUOY®** is 'awoken' from its sleep mode, in one of four ways:

- When an Acoustic Command is received.
- When a Release Event is about to take place.
- When a 'leak' is detected inside the chamber; or
- During its automated, daily diagnosis of battery condition.

After an 'awakening', 'sleep' mode is re-entered automatically following a predetermined period of inaction.



## Acoustic Command



- **Standard model operational range up to 500m.**
- **Reliable 2 way Spread Spectrum Transmission technology (DSP).**
- **User friendly.**
- **Can be tailored to suit customer's needs.**

## BENEFITS OF THE FiOBUOY® TECHNOLOGY

- **Improved security for underwater assets.**
- **Improved safety for marine navigation.**
- **Cost effective retrieval of underwater assets.**
- **Removal of visual pollution.**
- **Improved sharing of marine resources between competing interests.**

# FiBUOY® METHOD OF OPERATION



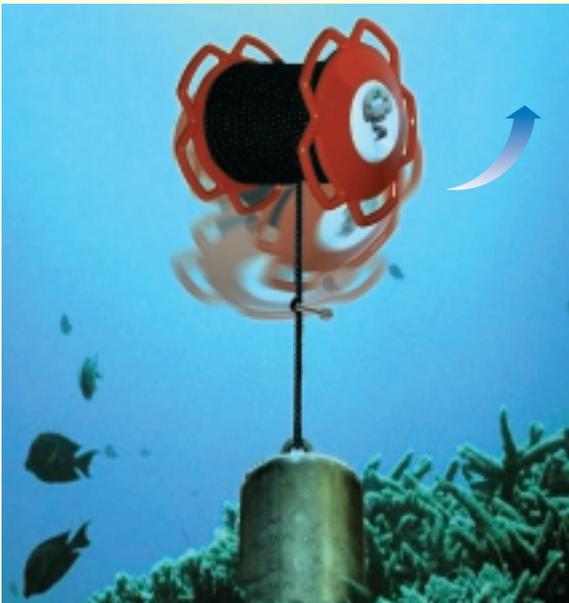
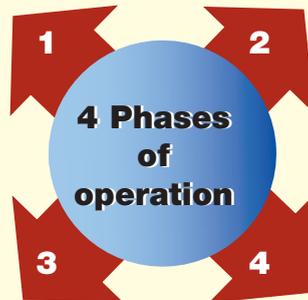
## PROGRAMMING THE FiBUOY®

A specific time and date or acoustic operating parameters, on which the buoy is required to release itself from its underwater mooring and ascend to the surface, is programmed into the FiBUOY® via a Deck Control Unit.



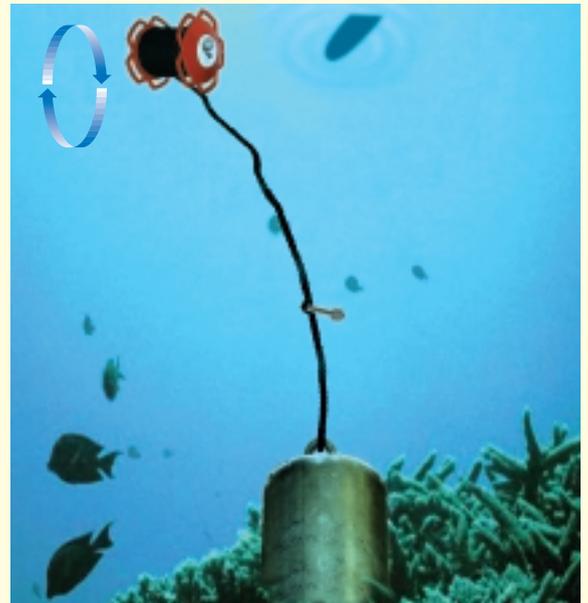
## UNDERWATER DEPLOYMENT

The FiBUOY® is attached to an anchor and/or equipment and subsequently submerged at a pre-determined location. The FiBUOY® is deployed in a vertical orientation due to its retention by the primary tether viz., the release pin (attached to the rope and) held securely by the 'closed' jaws of the release mechanism. The integral Acoustic Transducer is then facing toward the surface to receive acoustic commands.



## THE PROGRAMMED RELEASE EVENT

At a designated time and date, or upon receipt of an Acoustic Command, the release mechanism is activated and the FiBUOY® is freed from its primary tether. It immediately assumes a horizontal orientation and commences to rotate about its horizontal axis.



## ASCENT AND RECOVERY

The process of ascent occurs as a result of positive buoyancy while the FiBUOY® continues to rotate about its horizontal axis. The FiBUOY® remains connected to the anchor and/or equipment via its secondary tether. Recovery can occur immediately the buoy reaches the surface.

Australian Patent No. 640163.

Australian Patent Application No. P05974 and corresponding international applications.

Australian Design Application Nos. 933/1997 and 934/1997 and corresponding international applications.

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# KEY FEATURES

- **The FiOBUOY® is fully programmable.** It can release itself from its underwater mooring and surface at any time and date specified by the operator, or by Acoustic Command.
- **The Standard model is capable of deployment to depths of up to 100 metres.** There are several models available as well, for greater depth, a variety of ropes, and other options such as Strobe Light and customization.
- **An 'Acoustic Command' option is available.** This is a full two-way link, enabling re-programming or system interrogation whilst deployed. It utilizes latest DSP hardware and employs Spread-Spectrum technology for high reliability.
- **Designed for underwater deployment periods in excess of 6 months.** The onboard computer is constantly in 'sleep' mode except for its daily, self-diagnostic operation. This substantially diminishes power consumption and prolongs battery life.
- **Performs self-diagnostics.** The **FiOBUOY®** constantly reviews the condition of its onboard batteries to ensure the availability of sufficient power to perform a release event.
- **Performs emergency release.** During its daily battery check, the **FiOBUOY®** will perform an 'emergency' release where there is a risk of the batteries losing their energy prior to the date of scheduled release. This feature is also designed to prevent deployment where the battery voltage is considered too low.
- **Capable of leak detection.** The onboard electronics incorporate leak sensors which, upon detecting the presence of water in the central chamber, will actuate the release mechanism to perform an emergency release.
- **Password protected.** The onboard electronics are specifically encoded with a six digit pin number to prevent unauthorised use.
- **Robust construction.** The housing of the Fiobuoy is manufactured from highly durable polymers capable of withstanding the rigours of a harsh marine environment.

Presented by



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