

BLACK SHARK

ELECTRONICS DIVISION

'STEALTH' DUAL PURPOSE WIRE-GUIDED HEAVYWEIGHT TORPEDO



The BLACK SHARK, new generation heavyweight Torpedo, is the most advanced, technologically and operationally, multi-purpose weapon designed to be launched from submarines or surface vessels. It has been designed to counter the most challenging threat posed by any type of surface or underwater target for at least the next 30 years.

The BLACK SHARK is a 21" standard diameter, powerful, long range, fully stealth, wire guided and self homing heavy weight torpedo with incomparable capabilities obtained at affordable cost.

STATUS

The BLACK SHARK has been developed by Leonardo under contracts issued by the Italian Navy which is closely supporting the program. Leonardo is also the Prime Contractor and Design Authority of the complete Torpedo System. More than 100 torpedoes are being manufactured and delivered to a number of important navies in three continents.

Following the successful completion of the easy and affordable integration activities, the BLACK SHARK is now in service with U209, U214, U212 and Scorpene submarines.

MAIN CHARACTERISTICS

- › Dual purpose anti-submarine/anti-ship torpedo
- › Optimized for deep and very shallow (coastal) water deployment
- › Swim-out and push-out launch capabilities
- › Short length allowing easy integration with any submarine handling and launching system
- › Stanag 4405 interface compatibility to ease the electrical and functional integration with all modern combat systems
- › Full stealth with practically undetectable radiated noise obtained by the state-of-the-art propulsion system
- › Electrical propulsion system with high energy rechargeable battery
- › Very high top speed with stepless control in the whole speed range
- › Reliable optical fibre wire guidance link with high speed data rate
- › Tactical situation, continuously upgraded by the wire guidance link, available to the operator for threat assessment and target selection
- › Optimized acoustic head shape for reduced flow noise (target acquisition limited by sea state noise) and shallow water reverberations

- › Acoustic section with fully digital beam forming and advanced signal and data processing
- › Long detection range even on small, zero doppler and silenced targets
- › Audio Channel and demon analysis capabilities performed on board the torpedo
- › Very sophisticated ACCM features including simultaneous multi-target capabilities.

ADVANCED ACOUSTIC HOMING

The acoustic head of the BLACK SHARK, named ASTRA (Advanced Sonar Transmitting and Receiving Architecture), is a state of the art active and passive acoustic head for modern torpedoes which represents the latest effort made by Leonardo. It is possible to use ASTRA as an additional remote sensor of the submarines combat suite.

The advanced signal and data processing provides the following features:

- › Medium and high frequency operation in passive mode
- › Spatial filtering
- › Multi-frequency and multi-code capabilities
- › Frequency filtering
- › Constant False Alarm Rate (CFAR) processing
- › DEMON analysis
- › Echo elongation, spatial coherence and angular extension analysis.

ELECTRICAL PROPULSION SYSTEM

It consists of a new design advanced Lithium-Polymer re chargeable Battery, with a very high power and energy content, of a contra-rotating direct drive brushless motor and of skewed propellers which assure



a minimum radiated noise and wakeless run and make impossible the torpedo detectability at useful ranges even by modern towed sonars.

SENSORS

- › Availability of multiple wake sensors for detection and classification, immune to countermeasure
- › Optimized wake homing capability
- › Target simultaneous tracking and homing in acoustic and wake modes.

POWERFUL EXPLOSIVE CHARGE

- › Lethal for surface vessels and submarines, activated by both acoustic influence and impact fuses
- › Safety and reliability verified in any operational phase
- › Warhead proven against real targets
- › Insensitive Munition Explosive (STANAG 4439).

SUBMARINE SYSTEM

- › Launch performed at any operational depth of the submarine
- › Presence of the launching submarine not disclosed (start up at low speed, cavitation free)
- › Continuous monitoring of Torpedo Board Interface (TBI) solutions for integration on existing platforms and different types of Combat Management Systems.



For more information:
infomarketing@leonardocompany.com

Electronics Division
Via Valdicocchi 15
19136 La Spezia - Italy
T +39 0187 5811
F +39 0586 854060

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