

MASS

- Mobile Acoustic Scoring System
- Automatic Scoring and Assessment
- Reduced Mission Costs
- Portable



DEFENSE & SECURITY

The Mobile Acoustic Scoring System (MASS) is a waterborne, portable, ship-deployable/recoverable range and training tool. MASS scores and analyzes live-fire surface gunnery exercises, air-to-ground weapons exercises, and other test and evaluation events.

The MASS concept is based on the recognition that a projectile will generate a detectable acoustic event when it impacts water. The characteristics of this type of acoustic event can be detected and accurately located with an in-water array of acoustic sensors and digital signal processing technology.

The MASS system consists of acoustics sensors, which are incorporated into five sensor buoys. When an acoustic event occurs the buoys triangulate the location of impact. Global-Positioning Satellite (GPS) receivers provide precise positioning data of the buoys and firing platforms. Upon impact detection, the buoys transmit data to the system controller unit located on the supporting platform. The system controller calculates and displays the projectile's impact location in real-time allowing immediate feedback to the firing platform.

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MASS

TECHNICAL SPECIFICATIONS

SYSTEM COMPONENTS

- Vessel base station comprising of standard laptop computer and radio transceiver
- Vessel based radio repeater
- Buoy operating array, typically 5 units
- Each buoy equipped with GPS, radio, hydrophone, radar reflector and flashing warning beacon

VESSEL BASED COMPONENT SPECIFICATIONS

Base Station (PC)

- Size: 30 cm x 23 cm x 7 cm
- Features: Provides acoustic event location data in numerical and graphical form. Map overlays are optional.

Radio

- Size: 23 cm x 10 cm x 5 cm plus 10 cm omni-directional antenna
- Features: 900 MHz spread spectrum radio, 1 watt RF power. Powered from vessel, 110/220 V

Repeater

- Size: Approximately 38 cm x 38 cm x 15 cm plus 50 cm omni-directional antenna
- Operating Time: 48 hours on internal battery
- Weight: Approximately 9 kg
- Features: Mast mounted at a minimum of 15 meters height above water for range. Self-contained in environmentally seal enclosure, +12 V rechargeable battery, 900 MHz spread spectrum radio, 1 watt RF power

BUOY SYSTEM SPECIFICATIONS

- RF range: At least 20,000 m line of sight, maximum depending on conditions and repeater height, 900 MHz spread spectrum radio, 1 watt RF power
- Buoy GPS self-location accuracy: Less than 10 m 99% of locations. Less than 2 m for 1 standard deviation
- Buoy accuracy for reported time of arrival of acoustic event: 150 microsec (equivalent to spatial resolution of 23 cm)
- Acoustic event detection range: At least 5,000 m in open ocean (low sea state conditions)
- Buoy acoustic projector range: Maximum 2,000 m
- Active operating time: 48 hours with fully charged battery pack
- Flotation collar: Diameter 61 cm, depth 20 cm. Materials: ionomer foam. Colour: Yellow
- Hull: Diameter 15 cm, length 120 cm. Materials: stainless steel. Weight: 36 kg
- Antenna mast: Diameter maximum 5 cm, length 390 cm. Materials: marine grade aluminum and stainless steel. Colour: White. Weight: 3.1 kg
- Hydrophone: Diameter 14 cm and suspension cable, length 6.6 m. Materials: piezoelectric ceramic. Colour: Black. Weight: 10.5 kg in protective cage



Buoy Deployment

Test Fire

System Controller Display

Buoy Recovery

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