

AN/AQS-22 ALFS

Airborne Low Frequency Sonar



The primary anti-submarine warfare sensor for the MH-60R helicopter

Benefits

- Performs search rates faster, reducing the amount of time on station
- Expands the size, quality and uniformity of the sonar detection area
- Maximizes sonar performance using multi-frequency operation that adapts to changing environmental conditions
- Monitors environmental conditions to optimize sonar performance
- Delivers high performance in both deep and shallow water
- Doubles as an underwater communications device

Crafted for Capability, Performance

The AN/AQS-22 Airborne Low Frequency Sonar (ALFS) is the primary undersea warfare (USW) sensor of the MH-60R multi-mission helicopter. This integrated dipping sonar system enables the MH-60R to accomplish the assigned USW missions of submarine detection, tracking, localization and classification. It also performs missions relating to acoustic intercept, underwater communications and environmental data acquisition.

In a Class by Itself

The AN/AQS-22 is the only in-service dipping sonar with multi-frequency operation. This capability enables the AN/AQS-22 to adapt its performance to varying environmental conditions.

With a rapid search rate, the AN/AQS-22 identifies and neutralizes threats sooner, enabling it to cover a larger area. The AN/AQS-22 also permits a longer detection range over a wider area, reducing the number of helicopters required to perform active anti-submarine warfare (ASW) screening.

Safety First

At 272 kg, the AN/AQS-22 ALFS impressively balances capability and weight while delivering the highest degree of operational safety. The reeling machine's innovative design and cable strength, as well as the fault monitoring and safety interlocks built into it, make the AN/AQS-22 the safest and most capable

dipping sonar in service today. Also, power to the AN/AQS-22 ALFS is supplied by the helicopter, eliminating the need for expensive in-unit sonar batteries.

Whole Life Services and Support

Raytheon, in partnership with DRS Sonar Systems and Thales Underwater Systems, produces an average of 20 full-rate AN/AQS-22 production systems per year. Additionally, Raytheon provides the full range of whole life services and support including spares, repairs and field service support.

Sonar Transmitter/Receiver

- High power waveform generation
 - CW (Continuous Wave)
 - LFM (Linear FM)
 - HFM (Hyperbolic FM)
- Five selectable frequency bands
- WQC signal generation
- Transducer data uplink decoding
- Transducer control tones transmittal
- Transducer status monitoring
- Dipper signal conditioning
- Safety interlocks
- Sonar subsystem BIT master

Cable

- Single-shielded coax
- Kevlar strength member
- 6:1 ratio safety factor at maximum load
- Corrosion resistance
- Torsion balance to minimize transducer rotation
- Abrasion resistant outer jacket
- Uplink/downlink signal path

Reeling Machine

- Hydraulic drive and backup (raise/lower)
- Electric drive (raise only)
- Hand-crank drive (raise/lower)
- Computer-controlled speed
- Limit switches and sensors
- Level wind mechanism
- Single pulley
- Cable angle sensors
- Guillotine
- Composite frame
- Spray shield, safety guards
- Cable wiper, drip pan
- Transducer locking mechanism
- Automatic bottom proximity stop

Transducer

- Ceramic projector rings
- Excellent hydrodynamic/aerodynamic characteristics
- Cardioid beamforming
- A/D conversion
- Environmental sensors
- Status sensors
- Pre-transmission BIT

Weapons Replaceable Assemblies

- Sonar Transmitter/Receiver – Forms the sonar energy pulses and performs fault-status monitoring and limited processing of sonar return data
- Reeling Machine Interface Unit – Controls sonar raise and lower functions
- Reeling Machine Control Unit – Provides controls and status displays
- Reeling Machine – Raises and lowers the sonar using hydraulic power; provides an electric raise as a backup mode
- Reel and Cable – Provides 2,500 feet of coaxial cable
- Transducer Assembly – Produces omni-directional pulses and deploys a receive array of 12 hydrophone stave arms

Specifications

ALFS Transmitter/Receiver

Dimensions: 11.2 in. (H) x 11 in. (W) x 25.3 in. (L)

Weight: 100 lbs

ALFS Cable

Length: 2,550 ft. of cable per reel

Weight: 144 lbs (reel and cable)

Diameter: 0.262 in.

ALFS Reeling Machine

Dimensions: 23.4 in. (H) x 22.6 in. (W) x 40.7 in. (L)

Weight: 159.1 lbs (without reel and cable)

ALFS Transducer

Length: 50 in.

Weight: 176 lbs

Diameter: 8.3 in. closed

Receive Array: 24 staves on 12 arms; hydraulic extension; spring retraction; extend/retract time <5 seconds

ALFS Reeling Machine Control Unit

Dimensions: 6 in. (H) x 5.75 in. (W) x 15 in. (L)

Weight: 4.6 lbs

ALFS Reeling Machine Interface Unit

Dimensions: 18.78 in. (H) x 6 in. (W) x 12.5 in. (L)

Weight: 13 lbs



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