

AN/AQS-22 ALFS

Airborne Low Frequency Sonar



The AN/AQS-22 ALFS is the next generation integrated dipping sonar system for the MH-60R helicopter. It is the primary anti-submarine warfare sensor supporting the Navy's Helicopter Master Plan.

Benefits

- Improved deep and shallow water capability
- Multi-frequency operation
- Expanded search rate capability
- Enhanced active ASW screening
- Active dipping sonar
- BT (environmental intelligence gathering)
- Underwater communications
- Mixed mode operations

The AN/AQS-22 Airborne Low Frequency Sonar (ALFS) is the primary Undersea Warfare (USW) sensor of the MH-60R Multi-Mission Helicopter. The AN/AQS-22 ALFS system enables the MH-60R helicopter to accomplish the assigned USW missions of submarine detection, tracking, localization and classification, as well as acoustic intercept, underwater communications and environmental data acquisition.

The AN/AQS-22 is a low frequency sonar that delivers a wide range of features not found in the Navy's currently-fielded helicopter sonar system. It improves system acoustic performance, safety and maintainability. It provides significantly greater detection range than currently-fielded airborne dipping sonars, superior performance against slow or stationary targets, and

improved detection of submarines in littoral waters.

The AN/AQS-22 is composed of seven Weapon Replaceable Assemblies WRA: Acoustic Processor (government furnished equipment); Sonar Transmitter/ Receiver (ST/R), Reeling Machine Interface Unit (RMIU), Reeling Machine Control Unit (RMCU), Reeling Machine (RM), Reel and Cable (R&C) and Transducer Assembly (TA). The acoustic processor performs data processing of sonar return pulses and monitors maintenance data. The ST/R forms the sonar energy pulses and performs fault status monitoring and limited processing of sonar return data. The RMIU controls sonar raise and lower functions. The RMCU is a reeling machine control box with reeling machine status displays. The RM raises and lowers

the sonar using hydraulic power and provides an electric raise as a backup mode. The R&C provides nominally 2,500 ft of coaxial cable. The TA produces omni-directional pulses and deploys a receive array of 12 hydrophone stave arms.

The AN/AQS-22 entered Low Rate Initial Production (LRIP) in October 2002 and entered Full Rate Production (FRP) in 2004.

Sonar Transmitter/Receiver

- High power waveform generation
 - Continuous Wave (CW)
 - Linear FM (LFM)
 - Hyperbolic FM (HFM)
- 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
- Pretransmission BIT

ALFS Transmitter/Receiver Specifications

Dimensions:	11.2 in. high x 11 in. wide x 25.3 in. long
Weight:	100 lb

ALFS Cable Specifications

Length:	2,550 ft of cable per reel
Weight:	144 lb (reel and cable)
Diameter:	0.262 in.

ALFS Reeling Machine Specifications

Dimensions:	23.4 in. high x 22.6 in. wide x 40.7 in. long
Weight:	159.1 lb (without reel and cable)

ALFS Transducer Specifications

Length:	50 in.
Weight:	176 lb
Diameter:	8.3 in. closed
Receive Array:	24 staves on 12 arms; hydraulic extension; spring retraction; extend/retract time <5 sec

ALFS Reeling Machine Control Unit Specifications

Dimensions:	6 in. high x 5.75 in. wide x 15 in. long
Weight:	4.6 lb

ALFS Reeling Machine Interface Unit Specifications

Dimensions:	18.78 in. high x 6 in. wide x 12.5 in. long
Weight:	13 lb



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