

Low Frequency Coherent Source Sonobuoy

Active Source

The Low Frequency Coherent Source (LFCS) is NATO, A-size sonobuoy manufactured by STS for use as a source in a multi-static field.

The LFCS is capable of generating a variety of waveforms upon command and is designed to work with the AN/SSQ-53F, AN/SSQ-77C and AN/SSQ-101 (ADAR) sonobuoys.

Prior to deployment, the LFCS's RF channel can be programmed to any of the standard sonobuoy operating channels. At any time after deployment, the LFCS can be commanded to change its operating parameters or depth (deeper only), generate a ping, or scuttle.

- All Digital Design
- High-power 96-channel RF Transmitter
- High-power LiSO₂ power source
- CSG or CFS Commandable
 - *Depth, Scuttle*
- CFS Commandable
 - *RF channel, Waveform type, Output power*
- Waveform types
 - *CW, Shaded Hanning CW, Hyperbolic-FM (HFM), HFM train, Sinusoidal FM (SFM), Linear FM up/down, Costas SONAR*



SPECIFICATIONS

PHYSICAL DESCRIPTION

Weight 16.3 kg (36 lbs)

Sonobuoy Launch Container.....LAU-126/A

PERFORMANCE DATA

RF Command Receiver..... UHF – single channel

RF Transmitter Power Output..... 1 W minimum

RF Transmitter Operating Frequency 96 Channel selectable
(136.000 to 173.500 MHz)

RF Transmitter Stability..... +-25 kHz

Sonic Frequency..... Baseline 950 Hz, other frequencies available (1 kHz to 5 kHz)

Operating Life..... 8 hours

Duty Cycle 10% maximum

Ping-seconds 140

Operating Depth..... Selectable
d1: 19.8 meters (65 ft)
d2: 53.3 meters (175 ft)
d3: 91.4 meters (300 ft)
d4: 152.4 meters (500 ft)

Transducer Array..... Piezoelectric Ceramic, Omni directional

Shelf Life 5 years in sealed container

AN/SSQ-36B Sonobuoy

Expendable Bathythermograph

The AN/SSQ-36B is a NATO A-size sonobuoy manufactured for the U.S. Navy which provides vertical temperature profiles of the ocean layer for research and ASW purposes. The AN/SSQ-36B is widely used for airborne Anti-Submarine Warfare (ASW) applications to evaluate local effects of seawater temperature on sonar propagation and acoustic range prediction.

Basic capabilities include a 2625 feet (800 meter) temperature profile and the capability to select one VHF transmitter channel out of 99 available channels. Thermistors located in the probe measures the changes in seawater temperature during descent from the surface. The data can be processed and displayed as Temperature versus depth via RF transmittal to the launch aircraft.

The AN/SSQ-36B Bathythermograph is air launchable from fixed or rotary-wing aircraft. Descent of the sonobuoy is stabilized and slowed by a parachute. It is also easily deployable from the deck of a surface vessel.

This sonobuoy provides an Electronic Function Select (EFS) for use prior to loading and launching. This allows the operator to select the RF channel.

- Sensor
 - *Temperature*
- Depth Profile
 - *0 to 800 Meters*
- EFS Selectable
 - *RF Channel*
- 1/4 Watt 99-channel RF Transmitter



SPECIFICATIONS

NSN 6655-01-418-5561

PHYSICAL CHARACTERISTICS

Weight7.3 kg (16 lbs)
 "A" Size 91.44 cm long x 12.4 cm diameter
 Sonobuoy Launch Container.....LAU-126/A

PERFORMANCE DATA

RF Transmitter Power Output.....0.25 W minimum
 RF Transmitter Operating Frequency 99 Channel Selectable
 (136.000 to 173.500 MHz)
 Sensor Temperature Range0 to 35° C
 Temperature Accuracy +/- 0.55° C
 Operating Depth..... 0 to 800 meters
 (0 to 2625 ft)
 Probe Descent Rate 1.5 m / sec. (5 ft. / sec.)
 Operating Life..... 12 Minutes (max)
 EFS SelectionsRF Channel
 Scuttle Automatic
 Launch Altitude..... 12 to 9144 meters (40 to 30000 ft)
 Launch Speed..... 0 to 370 KIAS
 Shelf Life 5 years in sealed container

AN/SSQ-53F DIFAR Sonobuoy

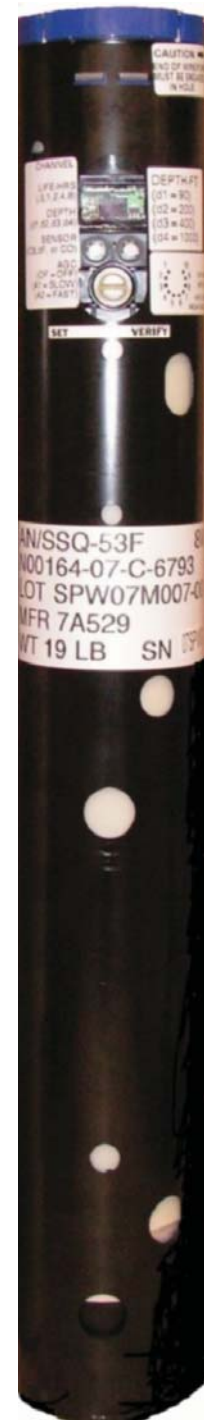
Passive Directional

The AN/SSQ-53F is a NATO A-size sonobuoy manufactured for the U.S. Navy which combines a passive directional and calibrated wide band omni capability into a single multi-functional sonobuoy. This advanced sonobuoy combines the capabilities of both the AN/SSQ-53D and AN/SSQ-57 sonobuoys.

The Q-53F can operate in three available acoustic sensor modes that are selectable via EFS or CFS. A Constant Shallow Omni (CSO) provides acoustic information at a fixed depth of 45 ft (13.7 m) while a Calibrated Omni (CO) co-located with a DIFAR sensor provides acoustic information at a selectable operational depth. The buoy amplifies the underwater acoustics and provides directional data necessary to establish bearing to the source of the acoustic energy.

This sonobuoy features both Electronic Function Select (EFS) for use prior to loading and launching, and Command Function Select (CFS) to allow the operator to modify the sonobuoy's mode of operation after it has been deployed in the water. These functions allow the operator to select operating mode (sensor selection), buoy life, depth setting, AGC level and RF channel.

- Acoustic Sensor Selection
 - *CSO, CO, or DIFAR*
- EFS Selectable
 - *RF Channel, Life, Depth, Sensor, AGC level*
- CFS Commandable
 - *RF Channel, Life, Sensor, AGC Level*
- 1 Watt 96-channel RF transmitter
- Factory configurable to AN/SSQ-53D standard
 - *Single Sensor (DIFAR)*
 - *3 Depths (90 ft, 400 ft, 1000 ft)*
 - *No CFS*



SPECIFICATIONS

NSN 5845-01-475-9870

PHYSICAL CHARACTERISTICS

Weight8.6 kg (19 lbs)
 Sonobuoy Launch Container.....LAU-126/A

PERFORMANCE DATA

RF Command Receiver.....UHF – single channel
 RF Transmitter Power Output.....1 W minimum
 RF Transmitter Operating Frequency96 Channel Selectable
(136.000 to 173.500 MHz)
 Sensors/Audio Frequencies.....CSO (30 to 5000 Hz)
CO (5 to 20 kHz)
DIFAR (5 to 2400 Hz)
 Operating Life.....0.5, 1.0, 2.0, 4.0, or 8.0 hours
 Operating Depth.....d1: 27 meters (90 ft)
d2: 61 meters (200 ft)
d3: 122 meters (400 ft)
d4: 305 meters (1000 ft)
 EFS selections..... RF, Life, Depth, Sensor, and AGC
 CFS selections..... RF, Life, Sensor, and AGC
 Launch Altitude..... 12 to 9144 meters (40 to 30000 ft)
 Launch Speed..... 0 to 370 KIAS
 Shelf Life 5 years in sealed container

AN/SSQ-62E DICASS Sonobuoy

Active Directional

The AN/SSQ-62E is a fifth-generation, all digital Directional Command Active Sonobuoy System (DICASS) used for detecting and localizing submarines in preparation for attack.

The DICASS is capable of providing both range and bearing to the target for accurate position fixing. Unlike previous versions, any AN/SSQ-62E sonobuoy is capable of supporting any of the four acoustic frequencies as selected via the Electronic Function Select.

The AN/SSQ-62E also incorporates Command Function Select, which permits the operator to modify the sonobuoy's mode of operation even after it has been deployed. The AN/SSQ-62E is available with either a standard Lithium Sulphur Dioxide battery pack or a Thermal battery pack for enhanced safety.

- All Digital Design
- CSG or CFS commandable
 - *Depth, Life, Scuttle*
- High-power 96-channel RF Transmitter
- Thermal or LiSO₂ power sources
- CFS commandable
 - *RF channel, additional depths, sonic frequency*
- Compatible with all known airborne acoustic processors
- Factory configurable to AN/SSQ-62D or 62B standards



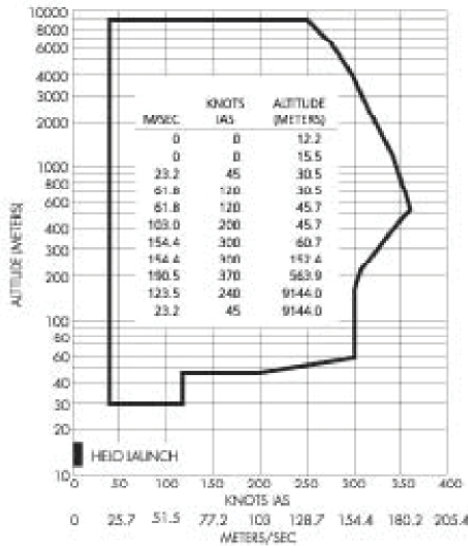
SPECIFICATIONS

NSN 5845-01-456-1317 Lithium Sulphur Dioxide Battery
 NSN 5845-01-456-5837 Thermal Battery

PHYSICAL CHARACTERISTICS

Weight 16.4 kg (36 lbs)
 Sonobuoy Launch
 Container Compatible LAU-126/A

PERFORMANCE DATA



RF Command Receiver UHF - single channel
 RF Transmitter Power Output 1 W minimum
 RF Transmitter Operating Frequency 96 Channel selectable
 (136.000 to 173.500 MHz)
 RF Transmitter Frequency Stability ±25 kHz
 Multiplexed Composite consisting of
 Omni Direct summation
 Directional Data (2 Channels) Suppressed carrier quadrature
 modulated on subcarriers
 Sonar Selectable acoustic channel (1 of 4)

Sonic Frequencies (any selectable from a single AN/SSQ-62E)
 A: 6.5 kHz, B: 7.5 kHz, C: 8.5 kHz, D: 9.5 kHz

Operating Life 1 hour minimum

Operating Depth D1: 15m, 46m, 92m (50', 150' or 300')
 D2: 27m, 120m or 460m (90', 400', or 1500')
 Commandable to 46m and 92m or 120m and 460m

Transducer Array Piezoelectric Ceramic
 Omni directional
 Transmit/Directional Receive

Shelf Life 5 years in sealed container

Selections (Deep Depth and RF Channel) Electronic Function Select

Selections (Depth, Acoustic Channel, RF Channel) Command Function Select

AN/SSQ-101 ADAR Sonobuoy

Passive Directional

The AN/SSQ-101 ADAR (Air Deployed Active Receiver) is a NATO A-size sonobuoy manufactured for the U.S. Navy which provides a commandable passive search capability. The ADAR sonobuoy is the receiver in a multi-static active receiver system.

When deployed the ADAR array utilizes a pentagon shaped horizontally oriented pattern of hydrophones to detect and beam form underwater sound waves. Each of the forty hydrophones is identical with locations along the circumference and radials of the array structure.

The analog output of each hydrophone is converted to a digital signal, serialized, beam formed and sent to the surface transceiver where it is broadcast on a five-watt minimum FSK modulated radio link. All beam-forming functions are accomplished within the sonobuoy with bearing information supplemented with a highly accurate digital compass.

This sonobuoy features both Electronic Function Select (EFS) for use prior to loading and launching, and Command Function Select (CFS) to allow the operator to modify the sonobuoy's mode of operation after it has been deployed in the water. These functions allow the operator to select depth setting and RF channel.

- EFS Selectable
 - RF Channel, Depth and Acoustic Band

- CFS Commandable
 - RF Channel and Acoustic Band

- 5 Watt Output 47-channel RF transmitter



SPECIFICATIONS

NSN: 5845-01-453-8699

PHYSICAL CHARACTERISTICS

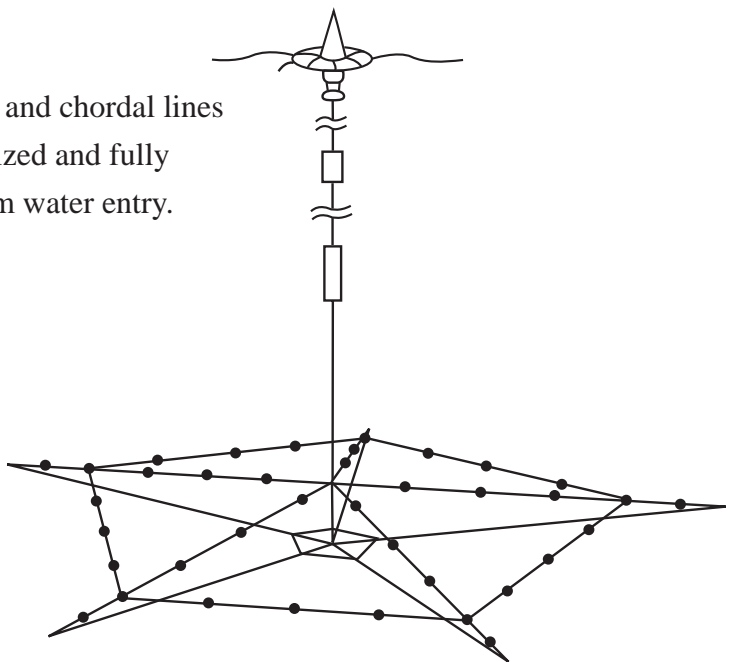
Weight14.1 kg (31 lbs)
 Sonobuoy Launch Container.....LAU-126/A

PERFORMANCE DATA

RF Command Receiver.....UHF – single channel
 RF Transmitter Power Output.....5 W minimum
 RF Transmitter Operating Frequency47 Channel Selectable
 (136.000 to 173.500 MHz)
 Sensor/Audio Frequency.....250 – 1000 Hz
 Operating Life.....4.5 - 6.0 hours
 Operating Depth.....d1: 19.8 meters (65 ft)
 d2: 91.4 meters (300 ft)
 d3: 152.4 meters (500 ft)
 EFS Selections RF, Depth, Band
 CFS Selections RF, Band
 Launch Altitude.....12 to 9144 meters (40 to 30000 ft)
 Launch Speed.....0 to 370 KIAS
 Shelf Life 5 years in sealed container

MECHANICAL DEPLOYMENT SEQUENCE

Hydrophone array fully deployed with radial and chordal lines tensioned. Complete ADAR sonobuoy stabilized and fully operational within specified 240 seconds from water entry.



MK-84 MOD 1 SUS

Air to Submarine Communications Device

The SUS MK-84 Mod 1 underwater sound signal device is an expendable electro-acoustic device which provides one-way acoustic communications with submarines. It can also be used to simulate the drop of an ASW weapon during a tactical exercise. It may be dropped or deployed from fixed-wing aircraft or helicopters as well-as by over-the-side ship-launched methods.

The SUS MK-84 Mod 1 is able to transmit any one of five pre-selected coded acoustic signals, each of which may convey a predetermined message to the submarine. Four of these signals consist of a continuous tone that alternates in frequency in accordance with a timing sequence defined in the coded table (see specification). The fifth code is a continuous tone at a single frequency. Third harmonics of the fundamental frequencies are also generated at levels slightly less than those of the fundamentals. A five position switch on the side of the unit accomplishes the settings.

The MK-84 is designed to provide a source level of 160 dB/uPa within 2 seconds of water entry throughout the life of the unit.

- Electronic SUS
 - *No Explosives*
- Activation Following Water Entry
 - *2 Seconds (max)*
- Life
 - *70 Seconds*
- Multiple Tone Selections (Codes)
 - *Five*
- Under Water Decent Rate
 - *15 ft per Second*



SPECIFICATIONS

NSN 1360-01-037-0588

PHYSICAL CHARACTERISTICS

Weight.....2.7 kg (5.9 lbs)

Size 38 cm (15 in) long x 7.6 cm (3 in) diameter

PERFORMANCE DATA

Sonar Source Level..... 160 dB

Sonar Operating Frequencies..... 3.3, 3.5 KHz
(plus third harmonics)

Underwater Descent Rate 4.5 m / sec. (15 ft / sec)

Operating Life.....70 Seconds

Launch Altitude0 to 3000 meters (0 to 10000 ft)

Launch Speed 0 to 300 KIAS

Shelf Life 10 years in sealed container

Code selections (Long 1.5 sec, Short 0.5 sec)

Code	F1 (3.3 kHz)	F2 (3.5 kHz)
1	Long	Long
2	Short	Long
3	Short	Short
4	Long	Short
5	Off	Continuous