



# HIDAR

## Dual Mode Directional Passive Sonobuoy Type SSQ 955

- High performance passive directional sonobuoy for littoral and deep water operations
- Designed for high noise environments and multistatic operations
- Autonomous Function Select – fully synthesised and programmable RF channel, life and depth settings
- Designed for internal carriage and release with 2-event safety criteria
- Digital RF link available as an option
- Global Positioning System (GPS) available as an option
- Coastal Surveillance buoy option with low salinity and shallow hydrophone depth settings for ice-edge or estuarine operations
- Calibrated buoy option for Sound Pressure Level measurement

The Ultra SSQ 955 HIDAR sonobuoy combines the world's best DIFAR sensor with an all-digital electronics design in a lightweight G-size package. This combination takes full advantage of digital signal processing to offer a buoy that outputs distortion-free acoustic data across a high dynamic range, and with superb linearity across an extended acoustic spectrum.

The buoy is ideal for use in high ambient noise conditions, eg in coastal environments, heavy rain, or near interfering shipping. The fully digital design also offers fast recovery in transient overload conditions and eliminates composite telemetry distortion when overloaded, making it well suited to acting as a low-frequency active receiver for multistatic operations.



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A variant of this sonobuoy, designed primarily for shallow water operations close to the shoreline, offers a solution to the complex demands of coping with difficult acoustic conditions found close to ice-melt, or in the fresh-water run-off environment of river estuaries. This variant will cope with all salinity conditions from fresh water to 3.6% salinity by weight.

### Operation

The SSQ 955 offers considerable benefits to maritime patrol aircraft, especially those with limited space and weight available. Its small, lightweight size is ideal for helicopter operations. Being internally carried and launched, all of its selections can be made simply and manually, prior to release, through the AFS selector. The buoy can also be hand-launched or fired from automatic launchers on ships and boats.

After release from the aircraft, a parachute limits the rate of descent to approximately 30 m/s. On water entry, a surface float is deployed, containing a VHF transmitter for acoustic data telemetry. Omni-directional and directional acoustic sensor signals are transmitted to an airborne or ship-based acoustic processor for passive detection of narrowband, broadband and transient submarine acoustic emissions. The buoy will also detect low frequency active emissions and echoes in a multistatic or active adjunct role.

In the 'HIDAR' mode, digitised acoustic data is transmitted with 14-bit precision, using a frame format compatible with SSQ 981 Barra. RF spectrum shaping allows operation on adjacent RF channels. The digitally synthesised 'Standard' mode is fully compatible with existing DIFAR processors but offers all the advantages of in-buoy digital processing

Safety mechanisms are included to prevent actuation or deployment until the parachute has deployed normally and the buoy has entered the water.

## Specification SSQ 955 HIDAR

### Description

Directional passive sonobuoy

### Dimensions

'G' size	
Length:	419.1mm (16.5 in)
Diameter:	123.825mm (4.875ins)
Weight:	5.6kg (12.3lb)

### Deployment

Platform speed:	50 to 375 knots
Platform altitude:	55m to 9144m (180ft to 30,000ft)

### Life (AFS Programmable)

1, 2, 3, 4, 5, 6 hours  
(Scuttles at end of life)

### Depth (AFS Programmable)

Settings:	30m	140m	300m
Time to full stabilisation:	100s	180s	240s
Alternate depth settings:	15m	30m	60m

### RF Channel (AFS Programmable)

Channels 1 to 99  
(136 MHz to 173.5 MHz, 375 kHz spacing)

### Telemetry Mode (AFS Programmable)

"HIDAR":	Coherent GMSK @ 224 kbps
"Standard"	FM (conventional DIFAR format)

### VHF Radiated RF Power

Effective radiated power:	1 Watt minimum
Nominal Radiation Pattern:	$\lambda/4$ monopole

### Sonic Frequency Response Shape

High pass, 316 kHz first order (nominal) standard mode

### Acoustic Frequency Range (HIDAR mode)

Directional sonics telemetry:	5Hz to 2000Hz
Extended omni:	up to 4000Hz

### Acoustic Sensitivity (HIDAR mode)

1 MSB $\equiv$ 154.3 dB re 1 $\mu$ Pa
1 LSB (of 14) $\equiv$ 76 dB re 1 $\mu$ Pa

### Acoustic Frequency Range (Standard mode)

Telemetry:	5Hz to 3375Hz
Full specification:	5Hz to 2900Hz
Improved bearing accuracy:	5Hz to 2400Hz

### FM Deviation Acoustic Sensitivity (Standard mode)

Omnidirectional:	122dB re 1 $\mu$ Pa RMS sinusoid $\rightarrow$ 25 kHz peak
Directionals:	122dB re 1 $\mu$ Pa RMS boresight sinusoid $\rightarrow$ 40 kHz peak

### Systematic Bearing Accuracy

$\pm$ 6 degrees (5 Hz to 2400 Hz)
$\pm$ 10 degrees (2400 Hz to 2900 Hz)

### Temperature Range

Seawater operating:	-2°C to +35°C
Un-packaged non-operating:	-20°C to +55°C
Packaged:	-50°C to +70°C

### Storage Life

Packaged:	7 Years
Un-packaged:	90 days at 95% relative humidity



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Printed in England

02 / 05 / TC / 200 / HaT