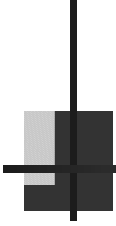


Subtrack

Sonar Targets
and
Acoustic Calibration Systems

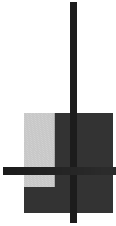
Subtrack Acoustic Systems



Subtrack Users

- 
- United Kingdom
 - Spain
 - France
 - Germany
 - Japan
 - South Korea
 - Australia
 - Turkey
 - Netherlands
 - Nato Foracs

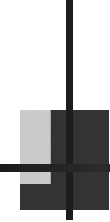
Subtrack Sonar Targets



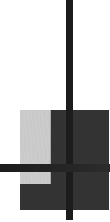
*Narrow
band lines*

*Broadband
noise*

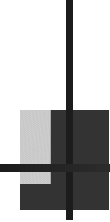
Subtrack Purpose

- 
- Training sonar operators
 - Command team training
 - Proving weapon systems
 - Proving sonar systems

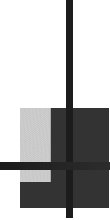
Subtrack Capabilities

- 
- Towed systems
 - Submarine based systems
 - Statically deployed systems
 - Sea-bed systems
 - Narrow band lines
 - Broadband noise
 - AM and FM effects
 - Pulses
 - Transients
 - Transponder
 - Echo repeating

Subtrack Training

- 
- Passive sonar operators need frequent training
 - Real submarine targets are expensive for training exercises
 - Friendly submarines provide target signatures that are too familiar

Subtrack Training

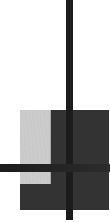
- 
- Typical training exercise:
 - Start with Subtrack shallow and high level
 - Gradually reduce levels
 - Increase depth
 - Increase manoeuvres
 - Switch off occasionally
 - Change signature
 - After several days add a real submarine if possible (complicates TMA)

Subtrack

Towed Systems

- High power systems or general targets
- Deployed from craft of opportunity
- Sonar system proving
- General research

Subtrack Handling Systems

- 
- Tow cables
 - Winches
 - Cranes
 - A-frames
 - Auto recovery gear



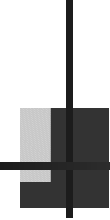
Subtrack Submarine Systems

- Augments submarine acoustic signature
- Permits the submarine to change signature and become a different type
- Provides a better target in noisy waters
- Helps operators to familiarise with submarine manoeuvres
- Weapon system proving

Static & Sea-bed Systems

- Deployed from a buoy or moored on the sea bed
- Range calibration
- Pre-deployment check and calibration

Subtrack Calibration Systems

- 
- Operation from 20Hz to 80kHz
 - Excellent beam patterns ($\pm 1.5\text{dB}$)
 - High source levels
 - Highly stable ($\pm 10^\circ$)
 - Environmental sensors

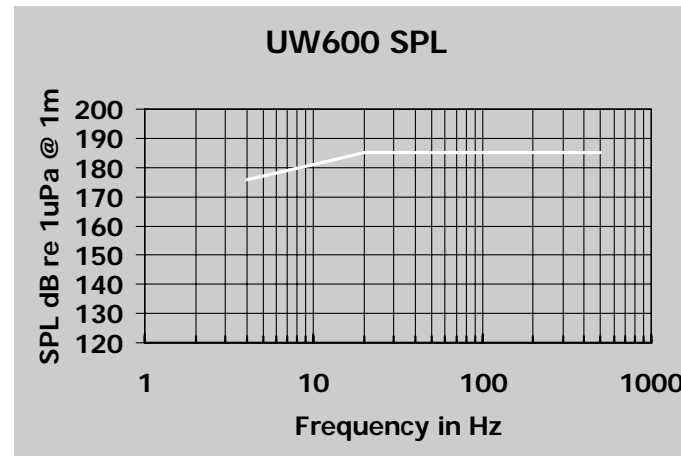
Subtrack Transducers

*Segmented
Rings*

*Low
frequency
moving coil*

*Spherical
transducers*

Influence Minesweeping



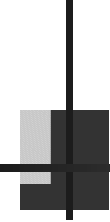
- Very low frequency (4Hz) capability
- High power – up to 185dB re 1 μ Pa @ 1m
- Very low stray field
- Family of transducers to increase bandwidth

Subtrack

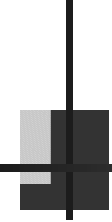
System Calibration

- Calibration in large reservoir
- UK MoD facility
- Beam patterns and SPL
- Able to test echo repeat and DME systems

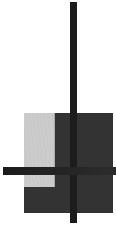
Intercept Sonar

- 
- Detects threat active sonars
 - Detects weapon active sonars
 - Performance up to 135kHz

Intercept Array

- 
- 3 frequency bands or 5 frequency bands
 - Carbon fibre dome for low flow noise
 - Titanium support structure
 - Complies with military environmental specifications

Intercept Transducers

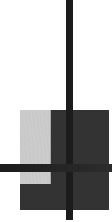


*Omni-directional ball
hydrophones for low and mid
frequency bands*

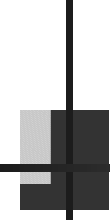
*Electronics pod for pre-
amplifiers*

*Directional high frequency
hydrophones. Constant angle,
low side lobes*

Intercept Array

- 
- Advanced polyurethanes for match to sea water
 - Structure filled with gas free oil
 - Easy servicing
 - Explosive tested

Intercept Array

- 
- Height 880mm
 - Length 900mm
 - Width 400mm
 - Beamwidth – customer specified
 - Sensitivity
 - >27kHz -160dB ref V/ μ Pa
 - <27kHz -170dB ref V/ μ Pa