Marine Electronics currently manufacture two different types of cavity profiling sonar probes. Both probes are designed to meet the robust requirements needed for surveying fluid filled cavities and are rated at 1000m operational depth. The probes are constructed from 316 Stainless Steel, acrylic and polyurethane so that they are inert to a wide range of chemicals.

The Mk1 probe is only 50mm in diameter and has a fixed transducer with an omni-directional beam pattern in the horizontal plane and a narrow beamwidth in the vertical plane. The probe is used to obtain quantitative measurements about an underground cavities minimum and maximum dimensions as it is lowered through the cavity, usually taking readings every metre. Built in Tilt, Pressure and Temperature sensors provide additional data.

The Mk1 probe connects to a dedicated interface unit which provides the d.c. power and telemetry interface via a 4 core steel armoured logging cable. The interface unit is controlled by a Windows P.C. (may be a notebook) running the CavProf software via an RS232 serial link.

**Features Include:**
- Rugged down-hole probes
- Directional or omni-directional beam patterns
- Surveying through lining tubes
- Robust 1000m digital telemetry
- High resolution colour display
- Dual tracking cursor for on-screen measurements
- Saving and restoring of raw data at full resolution
- Winch interface for automatic logging with depth
- Data download for external processing

The Mk2 probe is 100mm in diameter and has four rotating highly directional transducers driven by a powerful geared d.c. motor. The Mk2 probe is used to provide cross-sectional profile data of the cavity when the lining tubes have been withdrawn.

The Mk2 probe has four transducers mounted at angles to the horizontal of 0°, +45°, -45° and -90° which enables profiles to be taken even when near the roof or floor of the cavity. The transducers operate at 700kHz and have a narrow conical beam pattern. The transducer head is coupled via slip-rings so may freely rotate through 360°. Normally a sweep is taken every 1m in depth with 400 transmit/receive cycles (0.9° angular increments) per revolution. The time taken to gather the data for one sweep is range dependant but is typically only one minute at a 50m range. The -90° transducer acts as a multi-return echo sounder providing a scrolling height above cavity floor display as the probe is lowered.

The Mk2 probe has a built in Fluxgate compass which is linked into the head positioning software which then orientates the graphical display of the cavity cross-section relative to magnetic North.

The Mk2 probe connects to the Interface Unit in the same manner as the Mk1 probe and is also controlled by the CavProf software.
Mk1 Omni-Directional Cavity Probe

Dimensions:
Length: 1844mm
Diameter: 50mm

Weight:
20kg

Material:
316 Stainless Steel and Acrylic

Temperature:
Operating: 0°C to +40°C
Storage: -20°C to +65°C

Operating Depth:
1000m

Operating Frequency:
Variable 28kHz to 41.5kHz

Transducer:
Cylindrical in oil filled pressure balanced Acrylic housing

Vertical Beamwidth:
7° at 33kHz and VoS 1800m/s

Horizontal Beamwidth:
360°

Transmit Pulse Length:
Variable 100μsec to 2msec

Transmit Power:
Variable up to 400W

Receiver Gain:
Variable with 16 levels

Pressure Transducer:
0 to 100Bar

Temperature Sensor:
-20°C to +80°C

Tilt Sensors:
Dual Axis +/-20°

Power Supply:
+/−40v DC at 250mA

Cable Requirements:
4 core + armoured screen

Mk2 Directional Cavity Probe

Dimensions:
Length: 1633mm
Diameter: 100mm

Weight:
35kg

Material:
316 Stainless Steel and Polyurethane

Temperature:
Operating: 0°C to +40°C
Storage: -20°C to +65°C

Operating Depth:
1000m

Operating Frequency:
700kHz

Transducer:
4 off discs at -90°,-45°, 0°,+45°

Beamwidth:
1.8° (+/- 3dB full angle)

Transmit Pulse Length:
Variable 100μsec to 2msec

Receiver Gain:
Variable with 16 levels

Power Supply:
55v DC at 1A

Cable Requirements:
4 core + armoured screen