



SBP 29 - SUB-BOTTOM PROFILER

The SBP 29 is the next generation narrow beam sub-bottom profiler, and is the successor of the successful SBP 120 and SPB 300. The system has new and improved technology, wider bandwidth 2 – 9 kHz and improved range resolution.

The primary application of the SBP 29 is to do sub-bottom imaging of sediment layers and buried objects. The data can be stored as raw or in SEG-Y format.

System properties that affect image quality are:

- A narrow beam width
- The range resolution limited by the signal bandwidth
- A high source level that improves the signal to noise ratio

The array geometry of the SBP 29 is the same as that used by the EM multibeam echo sounders. For reception it uses the wideband receive antenna of the EM system. With much narrower beam widths than conventional sub-bottom profilers, the SBP 29 provides superior specular return to backscatter ratio and thereby improved penetration and less cluttered imaging. SBP 29 comes as 3, 6 or 12 degrees transmitting array system.

For the three degree transmitter, the frequency dependent source level is above 224 dB re 1 μ Pa @ 1m between 3.5 kHz and 6.5 kHz.

The SBP 29 beams are electronically stabilized for roll and pitch, and the data are heave compensated. The system has a couple of advantages when encountering sloping sediments compared to other systems:

- For each ping a swath of beams can be made that cover the across track footprint of the transmitter, making the system tolerant to across track slopes.
- It is possible to operate with wider beams, trading slope robustness for signal quality.

Two transmit modes are implemented as tools when sloping sediments is a problem:

- One transmit mode allows cyclic variation of the beam widths. In this manner echograms imaging the sub-bottom with narrow and wide beams can be collected in a single pass. When sloping sediments are missing in the narrow beam echogram, this information can be found in the wide beam.
- The other transmit mode offers volume scanning with narrow beams. By combining information from all beams in a scan, a composite echogram can be made with the slope robustness of a wide beam system and the data quality of a narrow beam system.

FEATURES

- High source level. Can be reduced by 30 dB in steps of 1 dB.
- Narrow beams giving improved penetration, cleaner data, and good angular resolution.
- Wider beams can be made when desired.
- A swath of beams can be generated per ping, offering across-track slope robustness. This swath is also useful for detection of buried objects and studies of backscatter.
- Transmit modes for use when narrow beams are unfavourable:
 - Cyclic variation of beam width
 - Cyclic variation of along-track beam tilt (volume scanning)
- Typically operated in parallel with the EM system, either synchronized or unsynchronized.
- Burst and multi-pulse modes to maintain a high ping rate in deep water



TECHNICAL SPECIFICATIONS

SBP 29 performance data

Operating frequency	2 to 9 kHz*
Number of beams per ping	Maximum 11
Maximum ping rate	20 Hz (Burst mode 5 Hz)
Beamwidth, 4 kHz (along x across):	
Transmit	3/6/12 x 35 degrees
Receive (EM 12x)	80 x 3/6/12 degrees
Receive (EM 30x)	120 x 7/14/28 degrees
Beam spacing	≤ 15 degrees
Fan width (RX)	≤ 30 degrees
Pulse length (FM and CW)	2 to 100 ms
Pulse type	FM (linear or hyperbolic), Ricker, CW
Range sampling rate	20.48 kHz
Roll stabilization	Yes
Pitch stabilization	Yes
Heave compensation	Yes
Range resolution	0.2 ms
Volume scanning (along)	+/- 15 degrees
Maximum penetration	>200 m (3 deg. system, depending on type of sediments and noise)

External inputs

Position
Heading
Motion sensor (pitch, roll and heave)
External clock
Depth, bottom slope angles and sound velocity information (from any EM multibeam echosounder)

*When the transceiver cabinet of the SBP 29 is used to upgrade existing SBP 120/300 systems the model number is SBP 27. For the SBP 27 the bandpass filter of the preamplifier is attenuating frequencies above 7 kHz.

Specifications subject to change without any further notice.

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