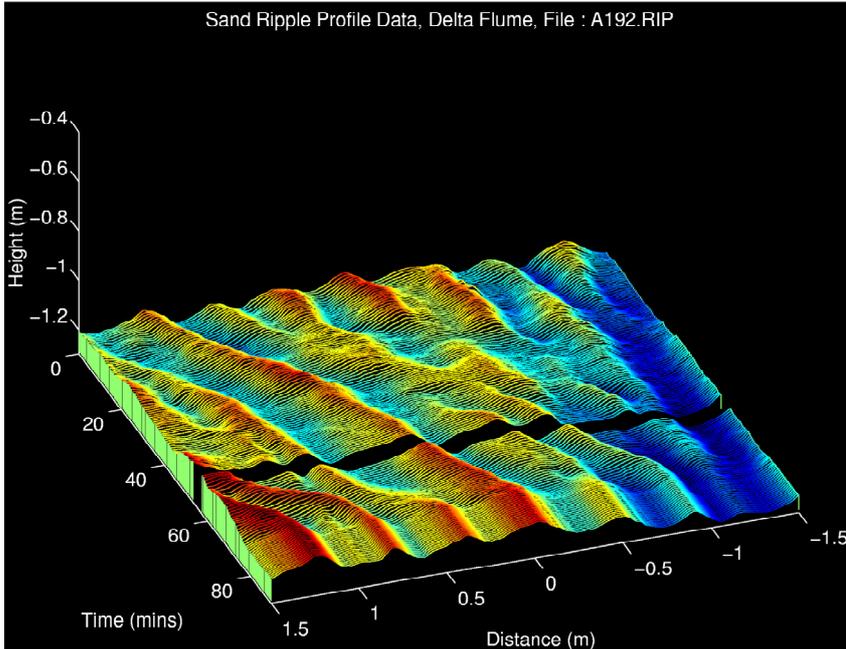
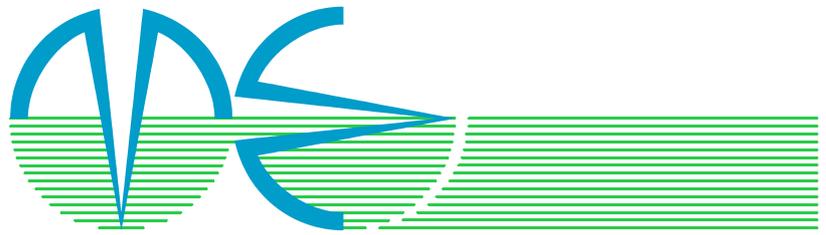


# Sand Ripple Profiling

## Sonar



Sand ripple profiler

to computer

The sand ripple profiling sonar is mounted horizontally and gathers data over a section of the seabed as shown above. The data is processed to record the profile of the sand ripples at intervals as they are transported underneath the sonar by the tidal flow.

The image above was created from a time series of ripple profiles recorded in the Delta flume in Holland. The gap in the data was for synchronisation purposes. At around 70 minutes the waves in the flume were switched off after which time the ripples remain static.

The Sand Ripple Profiling Sonar may be supplied either as a slave scanning unit or as an autonomous logging version with built in hard disk for data storage. The slave scanning version is controlled by an RS232 link from a master host computer. The host computer sends commands to control the sonar's transducer position and sampling parameters and receives digitised data representing the amplitude of the echo returns for each step position of the transducer.

The autonomous version is powered from an external 12v battery supply and has been engineered to take the minimum possible current when powered up but not scanning. The unit may be programmed in the laboratory by connecting a 12v battery and an RS232 lead to a PC running Windows. When programming is complete the unit draws very little power from an internal backup battery until its activation time. The sonar waits until the external 12v supply is present before attempting to capture data at its pre-programmed rate. If required, changes to the units program may be made in the field by connecting a portable PC via the RS232 input. At the end of the deployment period the internal hard disk may be removed and connected to a PC to quickly upload the captured data. Should the external power fail before the logging sequence is complete the data captured up to that time will be preserved.

The acoustic beam pattern, operating frequency and sampling speed have been specially selected for the purpose of accurately recording sand ripple profiles from a position close to the seabed.

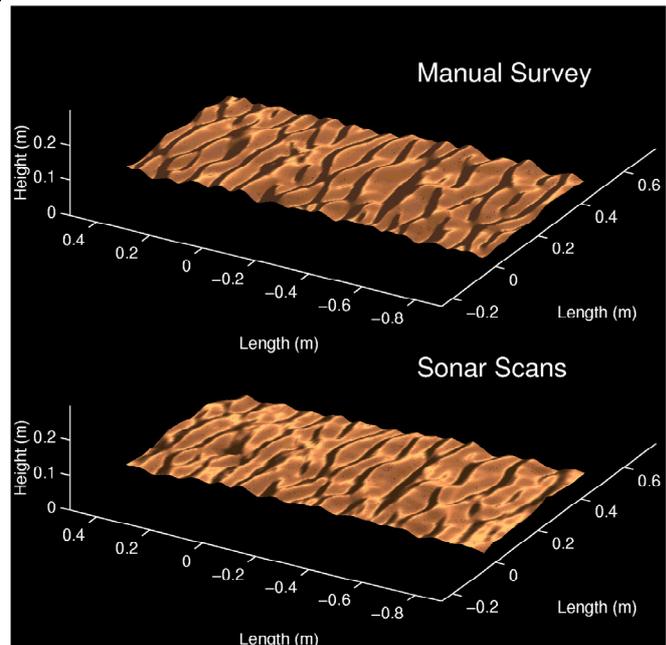
Images processed and presented by the



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To verify the accuracy of the sonar system a plaster cast of a sand ripples was manually surveyed to produce the uppermost image shown above. The Sand Ripple Profiling Sonar was then set up to scan across the plaster cast at 10mm intervals which produced the lower image.

### Sonars Manufactured by

Marine Electronics Ltd.,  
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## Sand Ripple

## Imaging and Profiling Sonars



The Sand Ripple Imaging (SRI) Sonar provides high resolution images in a transportable PC format for the minimum cost. Typically the sonar would be mounted near to the seabed and used to scan a circular area of the seabed up to 5m in range. The SRI Sonar operates at 2MHz with a 1° horizontal beamwidth and a 30° vertical beamwidth. Alternative transducers may be fitted to give different beam patterns and ranges depending on the specific application. In use the SRI Sonar requires a serial connection to a PC which controls the scanning process. The analogue output from the sonar provides freedom in the users choice of external signal processing. The transducer is fully enclosed in an oil filled rubber "boot" with no external rotating parts for complete environmental protection.

The Sand Ripple Profiling (SRP) Sonar effectively operates as an imaging sonar as it digitises the amplitude of the returned echoes over a programmed range. This approach allows the user to post-process the data to remove noise and mid-water targets caused by sand particles or fish. The SRP Sonar operates at 2MHz with a 1.1° conical beam to give precise range and bearing information over the scanned area which may be up to 360°. Typically the SRP Sonar is mounted horizontally near to the seabed and scans a cross-section of the seabed over an angular range of 120°. A data logging version is available with a built in hard disk for remote data gathering. The transducer is enclosed in a µPVC "boot" with no external moving parts for complete environmental protection.

### Marine Electronics Sand Ripple Imaging Sonar

#### Mechanical

<i>Length:</i>	318mm
<i>Diameter:</i>	89mm
<i>Finish:</i>	Hard Anodised Aluminium
<i>Operating Depth:</i>	1000m standard, 3000m optional
<i>Mating Connector:</i>	Wet-Con 6 way IL6FS
<i>Operating Temp:</i>	0°C to +40°C
<i>Storage Temp:</i>	-20°C to +70°C
<i>Weight in Air:</i>	2.9kg
<i>Weight in Water:</i>	0.9kg

#### Acoustic

<i>Acoustic Frequency:</i>	2MHz
<i>Horizontal Beamwidth:</i>	1° (-3dB full angle)
<i>Vertical Beamwidth:</i>	30° depressed -15° from horizontal
<i>Transmit Pulse Width:</i>	10µsec to 1msec programmable
<i>Range Resolution:</i>	Dependent on sample rate

#### Interface

<i>Type:</i>	(1) RS232 separate Rx/Tx (2) Analogue 2MHz
<i>Data Rate:</i>	9600 baud
<i>Protocol:</i>	Asynchronous with LRC
<i>Power Requirements:</i>	24-36VDC at 400mA cont. 2A peak



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### Marine Electronics Sand Ripple Profiling Sonar

#### Mechanical

<i>Length:</i>	360mm
<i>Diameter:</i>	89mm
<i>Finish:</i>	Hard Anodised Aluminium
<i>Operating Depth:</i>	1000m standard, 3000m optional
<i>Mating Connector:</i>	Wet-Con 6 way IL6FS
<i>Operating Temp:</i>	0°C to +40°C
<i>Storage Temp:</i>	-20°C to +70°C
<i>Weight in Air:</i>	2.9kg
<i>Weight in Water:</i>	0.9kg

#### Acoustic

<i>Acoustic Frequency:</i>	2MHz
<i>Beamwidth:</i>	1.1° (-3dB full angle)
<i>Transmit Pulse Width:</i>	10 µsec to 1msec programmable
<i>Sampling Clock:</i>	1µsec to 1msec programmable
<i>Sampling Resolution:</i>	8 bits

#### Interface

<i>Type:</i>	RS232 separate Rx/Tx
<i>Data Rate:</i>	9600 baud
<i>Protocol:</i>	Asynchronous with LRC

#### Autonomous Version Differences

<i>Length:</i>	400mm
<i>Diameter:</i>	130mm
<i>Weight in Air:</i>	4kg
<i>Weight in Water:</i>	1.5kg
<i>Power Requirements:</i>	(a) Sleep mode 12v dc @ <1mA (b) Scanning 12v dc @ 1A



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Specifications are subject to change without notice