

# C3D Deep Tow

Side Scan, Bathymetry, Sub-Bottom Profile

## 6000m Mapping Solution

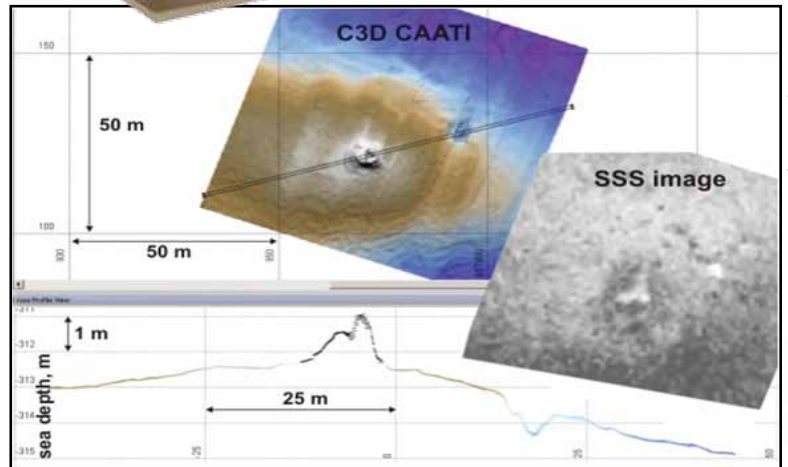
### An in depth view of the Seafloor

The Teledyne Benthos C3D Deep Tow system incorporates Side Scan Sonar, Wide Swath Bathymetry, and Sub-bottom technologies into one co-located towed system. It is capable of acquiring high-resolution side scan data along with Computed Angle of Arrival Transient Imaging (CAATI) interferometric bathymetry data. These data sets can be used to produce highly accurate 3D maps and images of the ocean floor. The C3D Deep Tow also generates sub-bottom data with a built-in high-resolution Chirp technology sub-bottom profiler. The combination of the three data sets provides the operator with an in depth view of the seafloor.

The C3D Deep Tow combines multiple technologies to produce images that clearly depict contacts which would be difficult or impossible to detect using side scan sonar alone. In addition, the system employs high-speed fiber optics to deliver reliable uplink and down link communications.

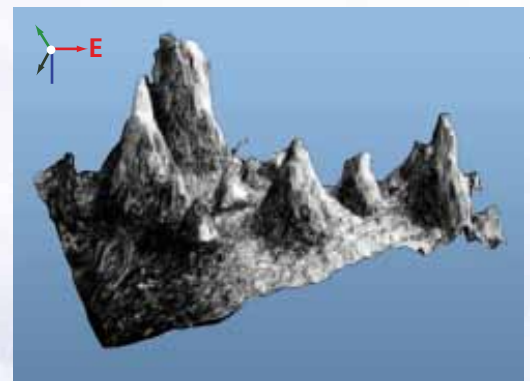
### Applications

- Deep Sea Mining
- Oil and Gas Research
- Cable and Pipeline Surveys
- Search and Recovery



C3D-SBP sample courtesy of PeterGaz, Russia

Modern Technologies of the Geophysical Investigations on the Shelf for the Purposes of Geohazards Detection. A. Fyodorov, S. Mironyuk, S. Kleshchin (Peter Gaz Ltd., Russia)



1700m depth, 40m tall

Courtesy of JOGMEC (DORR)



# Specifications, General, Physical, Environmental

## Specifications:

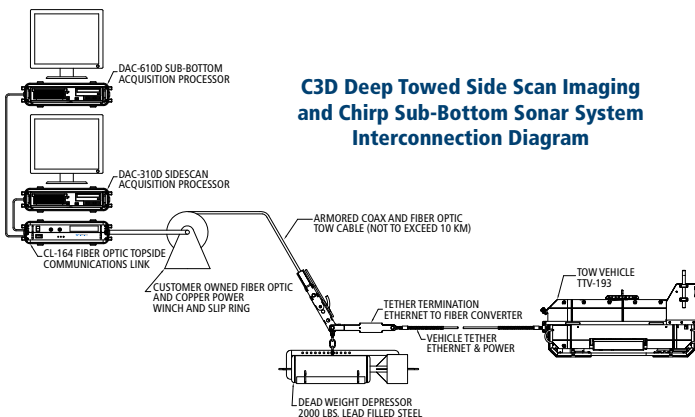
The Teledyne Benthos C3D Deep Towed (6000-Meter) Side Scan Imaging and Chirp Sub-bottom Sonar System includes the DAC-310 Side Scan Processor, the DAC-410 Chirp Sub-bottom Processor, the CL-164 Topside Interface Unit, and the TTV-193 Tow Vehicle. All specifications are subject to change without notification.

## Side Scan Sonar and Bathymetry Components

Sonar Frequency: 100 kHz  
 Maximum Operating Depth: 6000 meters  
 Side Scan Range: 25 to 500 Meters per side  
 Bathymetric Range: 10 to 12 times altitude  
 Resolution (across track): Side Scan Sonar - 5 cm  
 Bathymetry - 5 cm  
 Beam Width: 1.25° horizontal, 110° vertical  
 Pulse Length: 25 µsec to 3 msec (depending on range)  
 Repetition Rate: Up to 30 pings/sec  
 Transducer Angle: 20, 30 or 40 degrees  
 Transmit Source Level: Maximum 224dB re: 1µPa@1M

## Sub-bottom Sonar

Transmitter transducer: Benthos AT-3.5E1C low frequency transducer  
 Receiver hydrophones: Two 8-element hydrophone arrays  
 Acoustic source level: 204 dB re 1µPa@1m, user adjustable attenuation from 0 to -21 dB in 3 dB steps  
 Range: 10 to 750 meters  
 Chirp Frequency range: Sweeps in the 2 to 7 kHz band  
 CW Frequency: 1.5 kHz, 2.5 kHz, 3.5 kHz and 5.0 kHz, operator selectable  
 Transducer radiation: 35° fore and aft, 45° port and starboard combined transmit and receive  
 Receiver gain: User adjustable from 0 to 42 dB in 6 dB increments



## CL-164 Topside Interface Unit

Power input: 100–125 VAC or 220–240 VAC (auto sensing), 50–60 Hz, 80 watts nominal  
 Output Power: Voltage: 270 VDC nominal, 375 VDC factory set maximum  
 Power: 750 watts maximum @ 375 VDC

## Software

CAATI: Proprietary (standard)  
 Acquisition: Triton Isis (standard)  
 Side Scan/Bathymetry  
 Triton SB-Logger (standard)  
 Sub-bottom  
 Post-Processing: All third party available  
 Format: XTF and SEG-Y

## Auxiliary Sensors:

### Standard

- Pressure/Depth/CTD
- Heading
- Pitch
- Roll

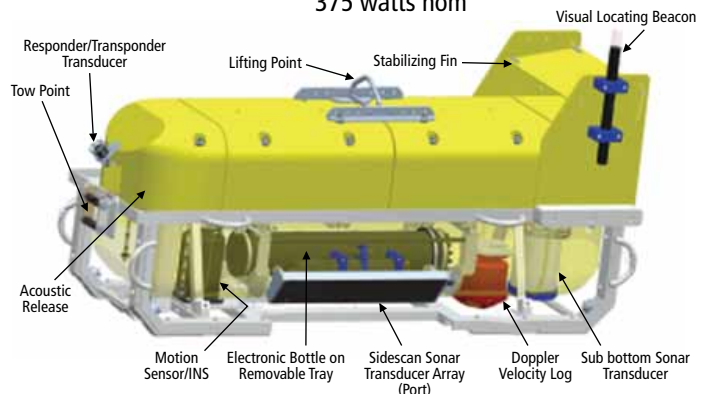
### Optional

- Altimeter
- Magnetometer
- Optical Gyro
- Motion Reference Unit/Heave/INS
- DVL
- Responder
- Transponder

## TTV-193 TOW VEHICLE

### Physical Characteristics

Construction: Aluminum frame with attached syntactic foam sections for buoyancy.  
 Dimensions: 239 cm (94 in.) long by 84 cm (33 in.) wide by 114 cm (45 in.) high  
 Weight in air: 1300 lb (590 kg), approximate  
 Weight in water: 200 lb (91 kg) buoyant  
 Depressor: Lead filled steel construction, 2000 lb (1497 kg) weight in air  
 Tether: 50-meter Kevlar reinforced  
 Operating depth: 6000 m  
 Towing speed: 1 to 5 knots operational  
 Input Power: 375 VDC, 600 watts max, 375 watts nom



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