

BATHY-2000P Chirp Sub-Bottom Profiler

Technical Specifications

Performance

- Sub-Bottom Resolution 8 cm.
- 100-200 Meter Sub-Bottom Penetration (Typical)
- Depth Accuracy ± 10 cm to 100 m, $\pm .3\%$ to 6,000 m
- Depth Range 0.5 m to 11,000 m (Frequency Dependent)

Signal Processing

- Embedded PC/Digital Signal Processing Chipsets
- **Chirp** Correlation Processing Gain > 23 dB
- Selectable First, Last, Peak, or Weighted-Mean
- Bottom Detection Technique
- Adaptive Bottom Tracking Filter -- Function of Vessel Speed and Terrain History
- 30 Point Sound Velocity Profile Correction
- Signal Strength Data Quality Assessment
- Adaptive Pulse Width and Power Level

Acoustics

- Transmit
 - 2 kHz - 6 kHz **Chirp** Bandwidth
 - Transducer Array Available in Tow Fish
 - Other Arrays Available
 - 2 kW Transmit Power (5-10 kW Option)
- Pulse Width Manual or Automatic 0.2 ms to 25.0 ms
- Power Level Manual or Automatic in 3 dB Steps
- Receiver
 - Sensitivity -120 dB re 1 volt
 - Dynamic Range 160 dB
 - Manual or Automatic Adaptive Gain Algorithm
 - Digital Pulse Width Matched Filter

Displays and Data Logging

- Integral, Color VGA LCD Monitor
 - *Graphical User Interface* for Operator Menus, Data Display
 - Sub-Bottom Data
 - 20 cm x 15 cm; 640 x 480 Pixel Resolution
 - Digitized Depth 1 m to 11,000 m
 - Range Scales: 0 to 10 m Min. to 0 to 11,000 m Max.
 - Phase Scale Ranges 10/20/50/100/200/500/1,000 m
 - 50% Overlap in Phase Scales
 - Selectable Color Palette; 256 Colors
- Optional Thermal Display Unit
 - 256 Greyscale (model dependant)
 - 300 LPI Resolution (model dependant)
 - Clean, Archivable Chart Records
- Data Logging
 - Removeable Internal Storage
 - Mass Storage Devices (contact Ocean Data for currently supported devices)
 - Networked Mass Storage

Physical Characteristics

- Electronics Weight < 44 lbs (20 kg)
- Dimensions 9.75 in (24.8 cm) H x 17 in (43.2 cm) W x 29.5 in (75 cm) D (standard rack)
- Rack-Mountable or Field-Portable Case
- Operating Temperature Range +10° C to +50° C

Physical Characteristics (continued)

- Humidity 95% Non-Condensing
- Optional Small Tow Fish
 - 14 in (36.5 cm) H x 21 in (53.3 cm) W x 55 in (140 cm) D
 - Weight < 100 lbs (45 kg)

Operator Controls, Alarms, and Indicators Via Keypad and Display

- Depth Range
- Depth Phase Manual or Automatic
- Power Level Manual or Automatic
- Gain Control Manual or Automatic
- Pulse Width Manual or Automatic
- Depth Units in Feet or Meters
- Sound Velocity 1400 to 1560 m/sec
- Transducer Draft
- Bottom Lost Alarm Adjustable for 1-10 Lost Returns
- Non-Volatile Internal Clock and Hour Meter
- Automatic Event Marker @ Intervals 5 min. to 60 min.
- Manual and External Event Marker
- Annotation for Depth, Range Scale, Set-Up Parameters, Event Marks, Time, and User-Entered Text

External Interfaces

- Eight RS-232 Interface Ports
 - Remote Digital Depth Indicator
 - Navigation Input (NMEA 0183)
 - Heave Compensation
 - Data Logger
 - External Event Marker
 - External Annotation
 - External Sound Velocity
 - Remote Depth Input
 - Status Message Output
 - One Spare Port

- Sonar Synch (TTL)
- External VGA Monitor

Power Requirements

- 110 / 220* V 50/60 Hz 250 Watts
- (* available with LPT Option)

Maintenance

- Built-In Self-Test on Power-Up
- Plug-In Modular Circuit Cards (LRU's)
- Mean-Time-To-Repair ≤ 1 Hour (LRU Level)
- No Calibration Required
- Easily Accessible Test Points

Options

- Network Interfaces (Ethernet, etc.)
- IRIG Timing
- Heave Sensor
- TDU-Series Thermal Greyscale Recorder
- Dual Frequency / Multi Frequency Operation
- 5 kW or 10 kW Amplifier
- Pinger Track Mode



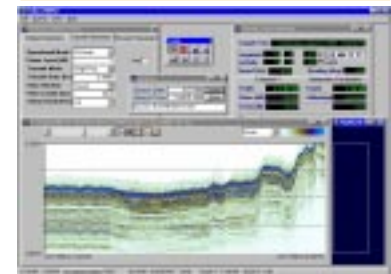
TR-109 Transducers



Model 400 Tow Vehicle with TC-2040 Transducers

Bathy-2000W

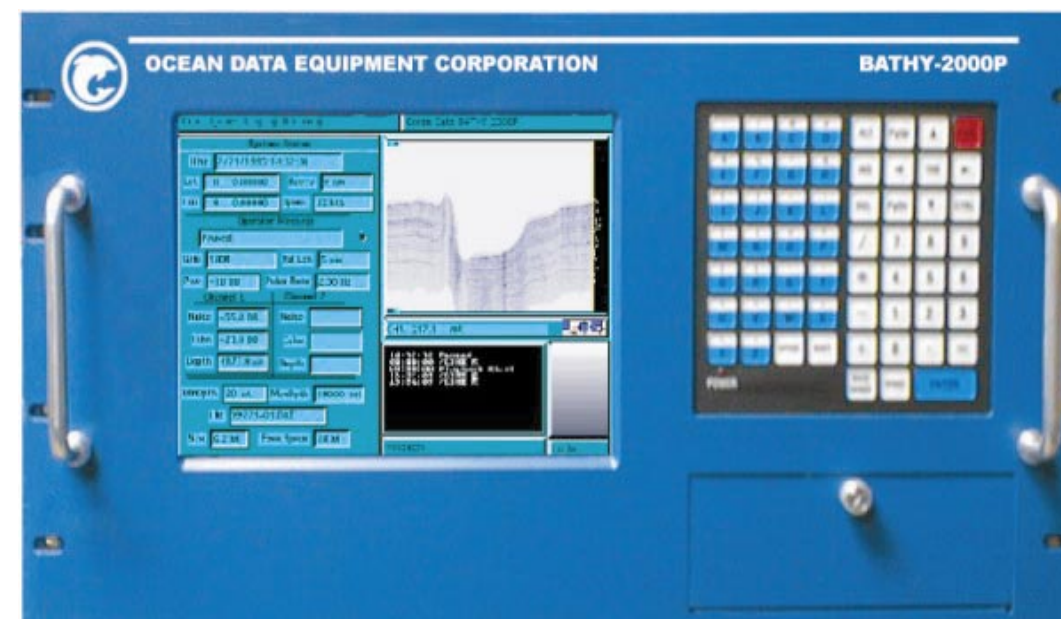
Users can readily interface the PC systems running Bathy-2000W to external storage devices and networks to allow archived data to be transported to and from other computing platforms. Features include: enhanced processing, thermal printing, and direct system control from a remote PC.



All specifications subject to change without notice.

BATHY-2000P

Chirp Sub-Bottom Profiler



*Portable, single-chassis Chirp Profiler
for Bathymetric,
and High Resolution, Sub-Bottom Data*



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BATHY - 2000P Chirp Sub-Bottom Profiler

Sub-Bottom Data, and Deep Ocean Bathymetry from a Portable System!

The **BATHY-2000P** is a **Chirp** sub-bottom profiling system providing 8 cm resolution of sediment strata with bottom penetration up to 200 mtrs.

It is designed for applications in rivers, harbors, and coastal waters and performs to depths of 6,000 meters. An optional amplifier enables the system to sound to 11,000 meters.

A tow fish / transducer array allows the system to be easily transported between ships-of-opportunity in support of pipeline routing surveys, engineering evaluations for construction sites, pre- and post-dredging volumetric/material classification surveys, and scientific studies of sediment types.

Optional, Bathy-2000W Post Processing software.

extends the value of survey data to support engineering decision-making.

High Performance

The **BATHY-2000P** provides 8 centimeter resolution sub-bottom profiles using an 8 kHz bandwidth FM **Chirp** waveform. **Chirp** signal processing provides a processed SNR gain of greater than 23 dB for improved resolution, greater depth capability, and enhanced performance in noisy environments.

A 2,000 watt power amplifier provides 25 msec FM waveforms for operation to 10,000 meters depth. Optional 5 / 10kW amplifier extends performance for deeper penetration. Processed data are displayed on an integral color LCD graphics display and recorded on an internal data logger for post-processing.

Embedded PC/Digital Signal Processing

The **BATHY-2000P** uses a highly flexible, embedded PC/DSP architecture which allows advanced real time digital processing and expansion capabilities. Time domain digital correlation, coupled with variable length FM waveforms, enables the system to perform extended depth operations while preserving sub-bottom layer resolution.

BATHY-2000P is from a family of echosounders available from ODEC. Visit our website for information concerning other Ocean Data echosounder models and configurations.

<http://www.oceandata.com>

Graphic User Interface



BATHY-2000P sub-bottom data. A primary Chirp frequency in 3.0 to 11 kHz range can be supplemented for bathymetry with added, optional frequency chosen by customer.

A 30 point Sound Velocity Profile in the **BATHY-2000P** permits highly accurate corrections for water column variability. Reliable data are obtained using ODEC's proven detection algorithms – generating robust bottom tracking in sloping terrain and excellent performance in high noise environments.

Menus

BATHY-2000P acquires the bottom on start-up and tracks automatically, yet all parameters are menu-selectable and manually controllable. Control is via an alphanumeric membrane keypad or, alternatively, over a serial port. The operator can input full text annotation to data files without the use of a separate keyboard.

Integration

BATHY-2000P is ideally suited to the needs of multi-mission research vessels, with extensive external interfaces integrating with shipboard systems and networks for external event annotation, NMEA 0183-formatted navigation data, heave sensor, sound velocimeter, extra RS-232 serial data ports, and external VGA monitor.

Options and Upgrades

Bathy-2000P systems can be configured with the following options and upgrades.

- LPT-5/10kW Amplifier
- Arrays of - 4, 6, 9, 12 or 16 3.5kHz transducers.

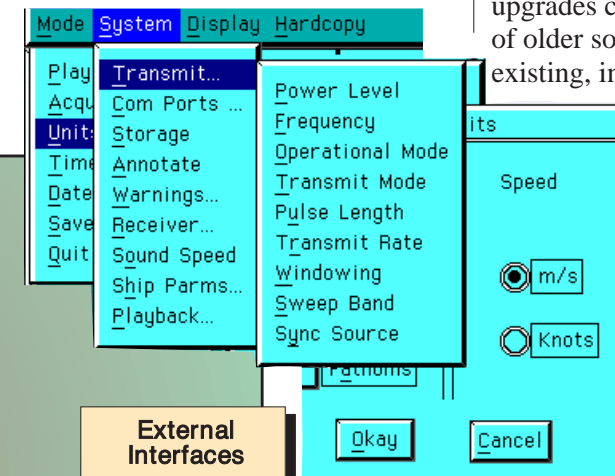
- TDU-850/1200 thermal Printers
- Dual Channel operation
- Sea Chests, Acoustic Windows, and Drawing packages
- Ethernet Network Interface
- SCSI Mass Storage

Bathy-2000W Processing

Bathy-2000W is an integrated software system designed to enhance the **real time** functionality and **post-processing** capabilities of **Bathy-2000P** series high resolution sub-bottom profilers. Designed for use on Windows 95® and Windows NT® platforms.

Transducer Arrays

The **BATHY-2000P** will drive single transducers and multiple unit arrays for **Chirp** applications. Plug compatible upgrades can be provided for all brands of older sounders to permit use of existing, installed transducers.



Operator Graphic User Interface is presented in series of simple and logical dialog boxes, data entry forms, pull-down menus, buttons.

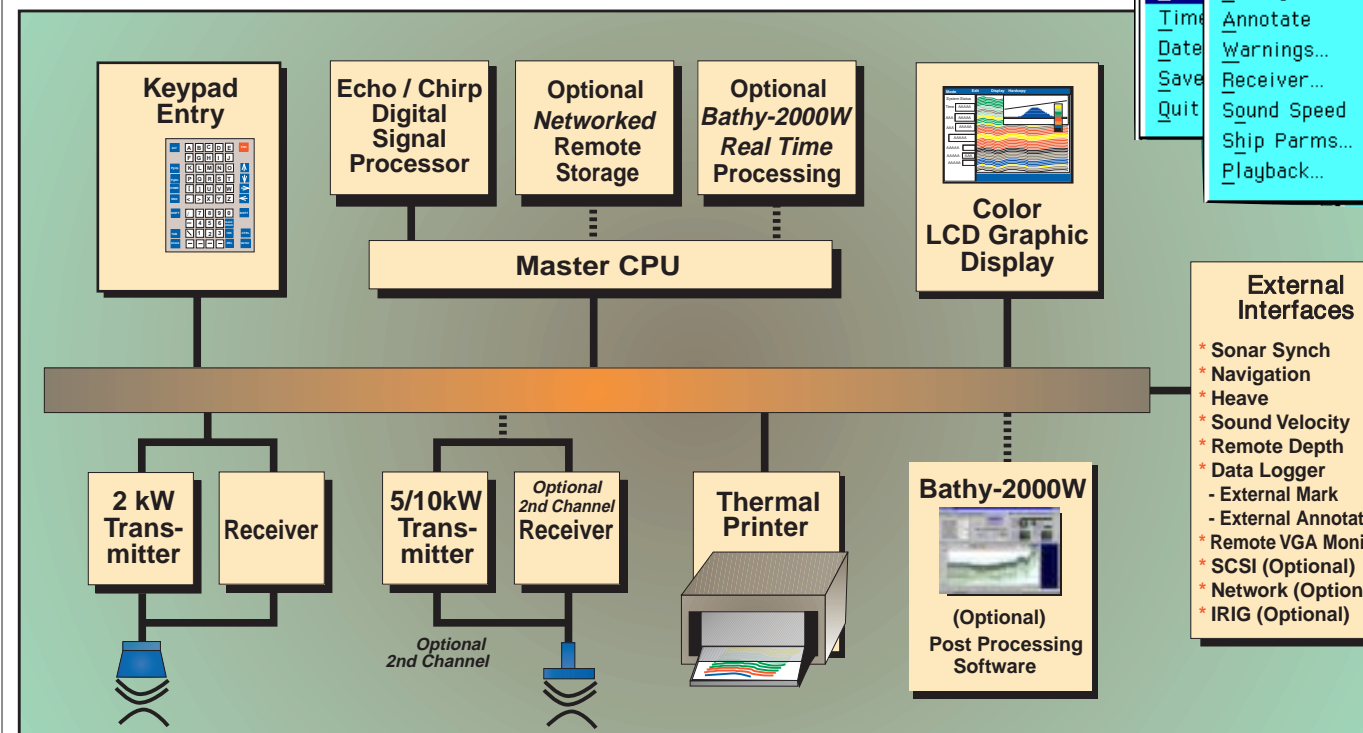


KEY FEATURES

- Rugged, Portable Electronics
- Chirp Signal Processing for 8 Centimeter Resolution
- Proven Bottom Detection and Tracking Algorithms
- Depth Range 0.5 Meter to 11,000 Meters
- NMEA 0183 and RS-232 External Interfaces for Shipboard Integration and Recording
- Integrated Color LCD Graphics Display
- 1.3 G-byte Removable Internal Hard Disk Storage

OPTIONS

- Bathy-2000W Windows 95® post processing software
- TDU-Series greyscale thermal recorder
- Linear Power Transmitter 5kW to 10kW



- External Interfaces**
- * Sonar Synch
 - * Navigation
 - * Heave
 - * Sound Velocity
 - * Remote Depth
 - * Data Logger
 - External Mark
 - External Annotation
 - * Remote VGA Monitor
 - * SCSI (Optional)
 - * Network (Optional)
 - * IRIG (Optional)

Transducer Options / Performance		
Frequency (kHz)	Beamwidth (Degrees)	Depth Range (M)
2.75-6.75 Chirp	25 - 50	6,000 - 11,000
3 - 11 Chirp	25 - 50	6,000 - 11,000
12	18	5,000 - 11,000
24	22	2,000
33	21	1,400
40	20	1,000
100	9	500
200	10	250
200	3	350