Simrad EA 500
Hydrographic Echo Sounder

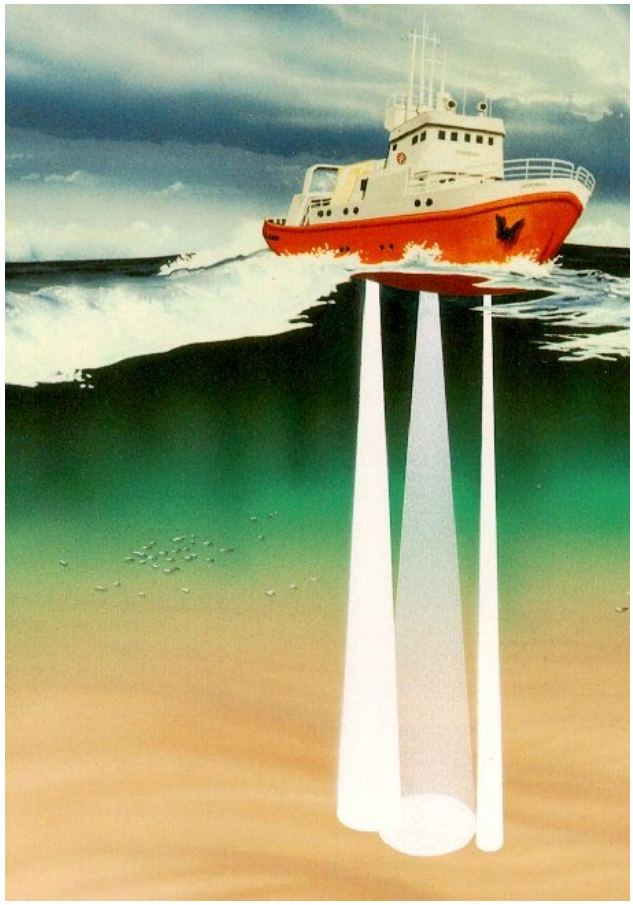
The hydrographer's must !

The Simrad EA 500

...is a modular triple channel hydrographic echo sounder, where extensive microprocessor technology combines the resolution of "the good old analogue sounders" with the benefits of a modern electronic echo sounder.

...is the first hydrographic echo sounder with 160 dB instantaneous dynamic range - the strongest and the weakest signal will be detected, stored and displayed without degradation.

...is the first hydrographic echo sounder with split beam transducers - measuring true inclination angles of the seabed in athwartships direction.



Unique EA 500 features

- Triple frequency operation
- Separate digitizer for each channel
- High transmitted power
- Pinger mode
- Extensive self-test functions
- Powerful multiprocessor system
- Multipulse operation, several pulses in the water simultaneously
- Sophisticated software algorithms for bottom tracking based on multi-criterion decision theory
- A wide range of transducers, single beam or split beam, or side-looking
- Split beam operation measuring bottom athwartships inclination angle
- Adjustable ping rate up to 10 pings / second

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(160768 / A - CB030)

- Digital data output for later postprocessing
- Ethernet interface type IEEE 802.3
- Remote computer command control
- Echogram presentation in 12 colours
- Menu-driven operation
- Uncomplicated push-button / joystick control
- Interface to heave, roll and pitch sensors
- Sound velocity compensation (manual or profile input)
- Navigation data input
- Annotation: data input or automatic
- Event marker input
- Pinger mode
- Deep water stabilized version, electronic beam control

Optional features

- Analyzing capabilities for silt measurements and sub-bottom profiling
- PC / workstation-based software for a variety of postprocessing and plotting purposes
- Side-looking channels
- Multichannel operation, 3x64 channels

Technical specifications

Operational range

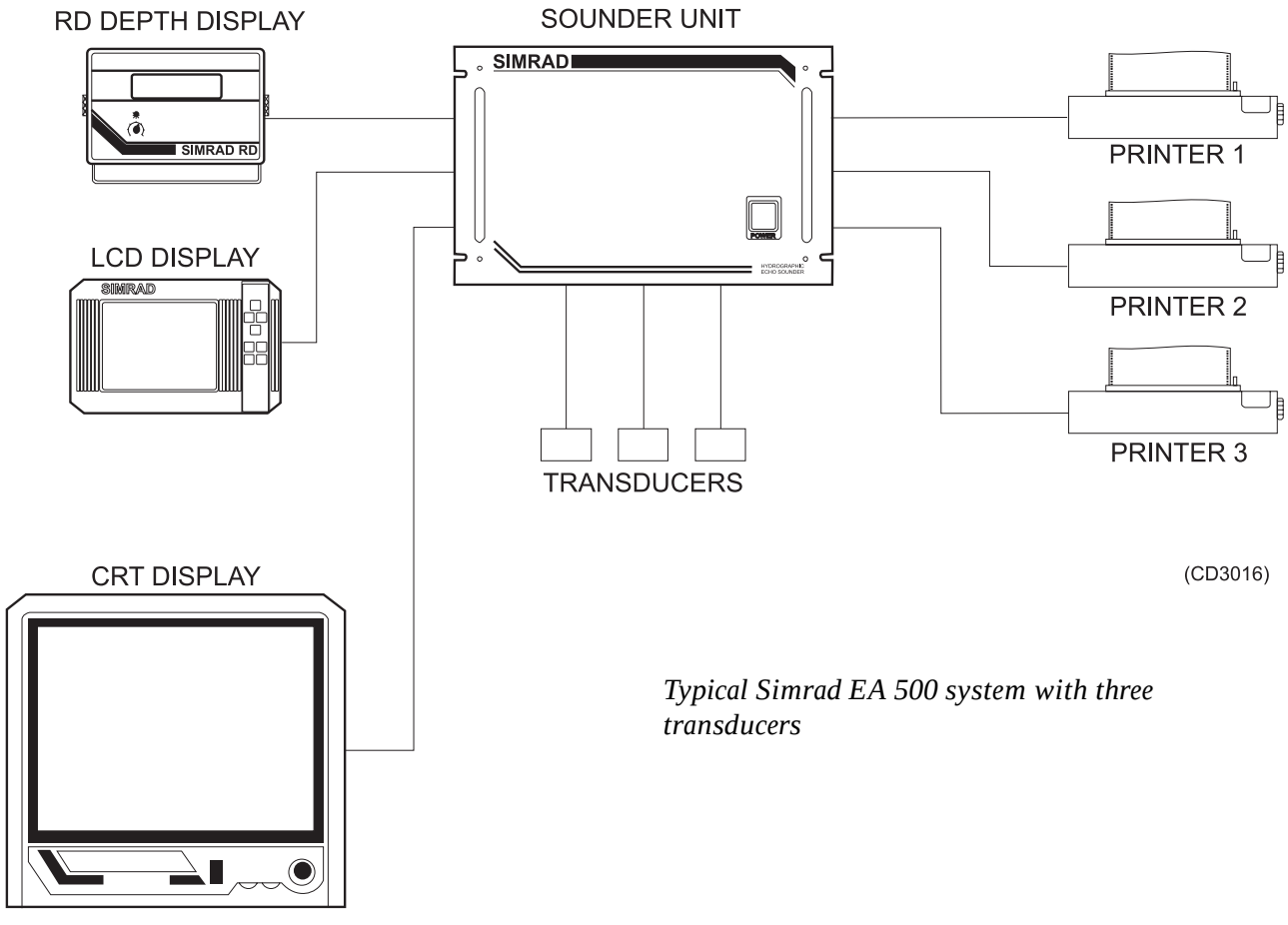
.....1, 5, 10, 15, 25, 50, 100, 150 250, 500, 750, 1.000, 2.500, 5.000 and 10.000 m

Phasing

.....0-10000 meters in 1-meter increments, manual or automatic

Display and recorders

- 1, 2 or 3 echograms shown simultaneously on each device
- Individual echogram setting for each device
- Colour scale related to true bottom surface scattering coefficient
- Ping rate: Adjustable, max 10 pings / second
- Sound velocity profile: Automatic input from probe via RS232C / Ethernet interface or manually entered



Typical Simrad EA 500 system with three transducers

- Navigation input data: Programmable format (NMEA 0183 included)
- Language menu: English, norwegian, french or german
- Output data: Programmable composition of telegrams (RS 232C and / or Ethernet)

Transmit and receive

Output power
regulation ..... 0 to -20 dB
relative to full power
(-3 dB, -23 dB selectable by jumpers)
Nonsaturated instantneous
input range ..... -160 dB to 0 dB
(dB relative to 1 W)
Noise figure ..... 10 dB
Terminal impedance: ..... 60 ohms

Voltage and power

Supply voltage ..... 187 - 264 Vac 50 / 60 Hz
90 - 132 Vac 50 / 60 Hz
21 - 31 Vdc
Power consumption ..... 100 W (one channel)
125 W (two channels)
150 W (three channels)

Environmental specifications

Operating temperature ..... 0 - 55 deg C

Physical dimensions, Transceiver

Width ..... 480 mm
Height ..... 310 mm
Depth ..... 440 mm
Rack ..... Fits in 19" rack
Weight, max configuration ..... 40 kg

Measurement resolution

cm ..... <_ 999,99 m
dm ..... > 1.000 m
m ..... > 10.000 m

Measurement accuracy

Similar to sample distance when sound velocity profile is correct.

Menu operation

Manual operation of the sounder is based on a menu system which to a large extent is self-explanatory. A keypad or joystick is used for command entry. The menus are organized in a tree structure similar to the directories of a modern computer operating system, with the current menu shown on the display.

Menu overview:

Operation

General purpose operation parameters

Display

- Controls echograms and alphanumeric information on the display

Recorder 1 and 2

- Controls echograms and alphanumeric information on the recorders (separate menu for each recorder)

Transceiver

- Menu for transceiver parameters

Bottom detection

- Controls the operation of the bottom detection algorithms

Navigation

- Controls the interpretation of input data from navigation receiver (NMEA 0183 included), position, speed and external clock.

Ethernet communication

- Controls the composition of data telegrams•

Serial communication

- Controls the composition of RS232 output data telegrams

Annotation

- Comment string and event marker control

Motion sensor

- Conversion constants characterizing the heave / roll / pitch sensor

Sound velocity

- Automatic or manual loading of sound velocity profile

Utility

- Beeper, status messages, set EA500 internal clock etc, or external clock.

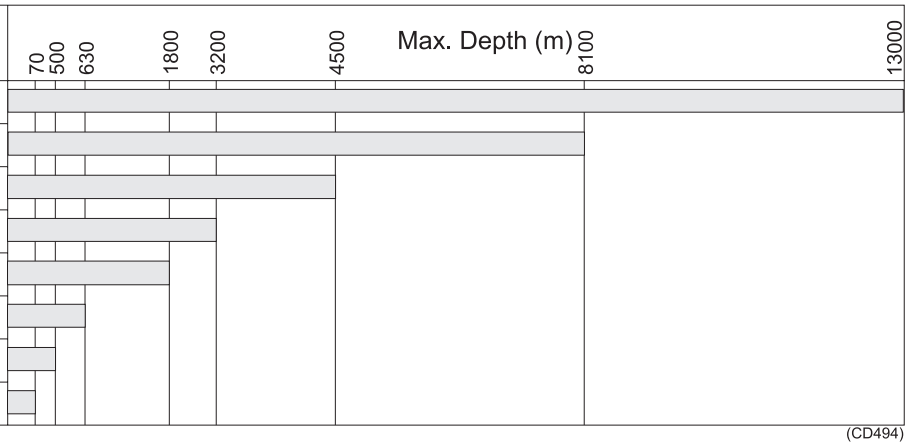
Test

- Production testing, service testing, calibration

Transducers

For selection of frequency and transducer, we recommend to use 70% of the theoretical depths in the table below, in order to obtain a reasonable safety margin and automatic bottom detection. The table below is based on an assumption of a backscatter strength of -10 dB.

Transducer	Type	Sounder Transmit Power
12kHz Single	12 - 16	2 kW
18kHz Single	18 - 11	2 kW
27kHz Single	27-26/21	2 kW
38kHz Single	38-7	2 kW
49kHz Single	49-26	2 kW
120kHz Single	120-25	1 kW
200kHz Single	200-28	1 kW
710kHz Single	710-36	50 W



Available transducers for the Simrad EA 500