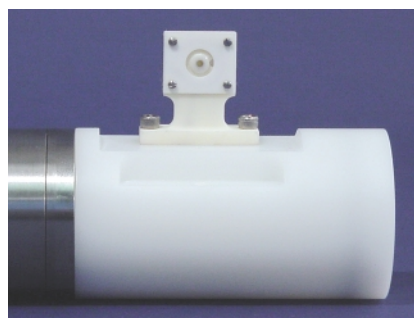


## Sea-Bird Introduces New Instruments

2001 has been an important year for the introduction of new Sea-Bird instruments:

**SBE 49 FastCAT** is an integrated CTD sensor intended for towed vehicle, ROV, AUV, or other autonomous profiling applications to 7000 meters. The FastCAT is an easy-to-use, light, and compact instrument made of titanium and plastic. It is externally powered, and its RS-232C data is logged or telemetered by the vehicle to which it is mounted. FastCAT does not support auxiliary sensor inputs.

FastCAT's pump-controlled, TC-ducted flow minimizes salinity spiking, and its 16 Hz sampling provides high spatial resolution of oceanographic structures and gradients. FastCAT's temperature thermistor and conductivity cell are the same as used in our premium 911*plus* CTD system. Its pressure sensor is the superior, micro-machined, Druck silicon strain-gauge. Sophisticated interface circuitry provides high resolution and accuracy — comparable to the 911*plus*. There are straightforward commands for continuous (full rate or averaged) or single sample acquisition. Calibration coefficients are stored in EEPROM memory, permitting data output in ASCII engineering units if desired.



**SBE 43 Dissolved Oxygen Sensor** sets a new oxygen standard for oceanographic research. The new sensor is a Clark polarographic membrane type in which careful choices of materials, geometry, and sensor chemistry combine with superior electronics interfacing and calibration methodology to yield major gains in performance.

**Calibration stability** is improved by an order of magnitude; the sensor holds calibration in shipment and requires less frequent calibration. **Temperature response** and corrections are dramatically improved. The largest source of error in profiling applications is nearly eliminated, and the equilibration *wait time* at the beginning of a profile is reduced to seconds. Profiling accuracy in gradients is dramatically improved. **Pressure hysteresis** is largely eliminated in the upper ocean (1000 meters). Oxygen features are more precisely resolved, and the agreement in down-and-up profiles reduces the ambiguity about which should be locked to bottle Winklers. **Continuous polarization** eliminates the wait-time for stabilization after power-up; the new sensor is always ready for immediate use. **Signal resolution** is increased by on-board temperature compensation. And because there is no *temperature* output signal, a CTD channel is made available for other purposes.



**SBE 16*plus* Conductivity & Temperature Recorder** and **SBE 19*plus* Profiler CTD** are the next generation SEACATs. These instruments bring numerous improvements in accuracy, resolution (in fresh as well as salt water), reliability, and ease-of-use to the research, monitoring, and engineering applications pioneered by their legendary SEACAT predecessors. Improvements in design, materials, and signal acquisition techniques yield low-cost instruments with superior performance that are easy to use.

The new SEACATs offer the improved C, T, and pressure specifications of MicroCATs. Memory is increased (8 Mbyte vs 1), and is now non-volatile FLASH. Four differentially-amplified A/D input channels (14-bit resolution vs 12) on two separate connectors, and a dedicated connector for the pump, simplify cabling. There is more power (500 ma vs 50) for auxiliary sensors. Calibration coefficients are stored in EEPROM memory, permitting data output in ASCII engineering units if desired. All exposed metal is titanium — instead of aluminum — for long life and minimum maintenance.

The 16*plus* is more power-efficient than old SEACATs: 9 alkaline D-cells record 400,000 samples of C and T. Its sample interval is soft-programmable in 1-second increments ranging from 5 to 14,400 seconds. Between samples, the 16*plus* powers down, drawing only 30 microamps.

The SBE 19*plus*' faster sampling (4 Hz vs 2) and pump-controlled TC-ducted flow configuration significantly reduces salinity spiking caused by ship heave, and allows slower descent rates for improved resolution of water column features.



## Software and Data Analysis

With the release this year of SBE Data Processing, Sea-Bird has nearly completed the conversion and enhancement of our DOS-based SEASOFT software package to a Win 95/98/NT platform. The Windows software provides much more flexibility and ease-in-use than the DOS software, and includes extensive Help files. SEASOFT-Win32 currently includes the following stand-alone programs:

**SEATERM**, a terminal program for interfacing with a wide variety of Sea-Bird instruments, can send commands to an instrument to provide status display, data acquisition setup, data retrieval, and diagnostic tests. SEATERM supports: SBE 11 / 11*plus* CTD Deck Unit; 16 / 16*plus* SEACAT C-T Recorder; 17 / 17*plus* SEARAM; 19 / 19*plus* SEACAT CTD Profiler; 21 SEACAT Thermosalinograph; 25 SEALOGGER CTD; 35 Thermometer; 37 MicroCAT (37-IM, 37-SM, 37-SI) C-T (optional pressure) Recorder; 38 Digital Oceanographic Thermometer; 39 Temperature (pressure optional) Recorder; 44 Underwater Inductive Modem; 45 MicroTSG Thermosalinograph; 46 LCD Display Box; 48 Hull Temperature Sensor; and 49 FastCAT CTD.

**SeatermAF**, a terminal program for interfacing with Sea-Bird instruments that include Auto Fire capability for operating a carousel water sampler, can send commands to an instrument to provide status display, data acquisition setup, data retrieval, and diagnostic tests. SeatermAF supports: SBE 17*plus* V2 SEARAM used with an SBE 9*plus* CTD; and 90208 Auto Fire Module used with an SBE 19 / 19*plus* SEACAT Profiler, SBE 25 SEALOGGER, or with no CTD.

**SEASAVE** defines the instrument configuration and calibration coefficients, and acquires, converts, and displays real-time or archived raw data. SEASAVE supports: SBE 9 / 9*plus* CTD; 16 / 16*plus* SEACAT C-T Recorder; 19 / 19*plus* SEACAT CTD; 21 SEACAT Thermosalinograph; 25 SEALOGGER CTD; and 49 FastCAT CTD.

**SBE Data Processing** consists of modular, menu-driven routines for defining the instrument configuration and calibration coefficients, and converting, editing, and processing oceanographic data. SBE Data Processing supports: SBE 9*plus* CTD with 11*plus* Deck Unit or 17*plus* V2 SEARAM; 16 / 16*plus* SEACAT C-T Recorder; 19 / 19*plus* SEACAT Profiler CTD; 21 SEACAT Thermosalinograph; 25 SEALOGGER CTD; 35 Thermometer; 37-IM and 37-SM MicroCAT C-T (optional pressure) Recorder; 39 Temperature (optional pressure) Recorder; and 49 FastCAT CTD.

**Plot39** plots ASCII data (.asc file) that has been uploaded from the SBE 39 Temperature (optional pressure) Recorder or SBE 48 Hull Temperature Sensor.

In the works is a Windows version of **SEAPLOT** for creating sophisticated data plots, which will essentially complete the Windows package. We expect to release a Beta version of SEAPLOT in late 2001.

Future enhancements and support for new instruments will be added to the Windows package only, but be assured that the DOS software will still be shipped and will remain available on our website for downloading.

## Training

This year Sea-Bird initiated regularly scheduled five-day training classes available four to five times per year at our factory/office in Bellevue, Washington. Training consists of comprehensive operator training on major Sea-Bird products and is hands-on in nature. The curriculum covers profiling instruments (days 1-3), moored instruments (day 4), and other products (day 5). The course syllabus and course handouts are available on our website.

Trainee evaluations from the first classes, held in July 2001, indicate that the classes were a great success!

## Bring Sea-Bird on your Next Cruise

An updated copy of the entire Sea-Bird website is placed on our FTP site every month for easy downloading. So, you can download the website to take on your next cruise for at-your-fingertips technical advice. Slow computer connection? Contact us, and we'll send the latest version of the website and our software, on CD-ROM.



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