TABLE VII

Sensors and Systems Specifications Summary

Item	Specification or Description
Surface Processor	DOS-based miniature PC with 1 MB memory. 2 MB non-volatile (PCMCIA) disk. Quiescent power drain less than 20 mW. Real-time clock and scheduler.
GPS Receiver	Ashtech OEM unit, 12 channels. L1 band, 1 pulse-per-second TTL output, 4 W power. Aircraft style antenna with LNA built into buoy endcap to withstand 40 psi.
Argos Transmitter(s)	Supports 2 Selmac SmartCat PTTs with integral data buffering and multiple IDs. Automatically cycles through 16 buffers and up to 4 IDs. Antenna is whip style through-bolted to endcap and requires no additional connector.
Surface-Bottom Telemetry	RS-422 (differential plus ground) over 3 conductor E/M cable. Max rate 115 Kbits per second.
Battery Power	15 Volts. 6000 Watt-Hours capacity
Status and Housekeeping	Monitors tension between buoy and hose, battery voltage, water temperature at bottom of hose.
Subsurface Processor	DOS-based miniature PC with 1 MB memory, 4MB non-volatile (PCMCIA) disk. Quiescent power drain less than 20 mW. Real-time clock and scheduler.
Subsurface Co-processor	AT&T DSP32C signal processor running at 50 MHz. 512 KB memory. Power switched.
Low frequency Acoustic Array	6 elements with 10 m spacing, −185 dB re uPa response, 2 wire current-mode interface. Kevlar outer braid with 8000 lbs breaking strength.
Low-frequency Analog Processing	4 pole high-pass and low-pass filters and programmable gain 300 Hz per channel sampling with direct DMA transfer to processor. Optically isolated interface.
High-frequency Ultra-short Baseline Acoustic Array.	4 element encapsulated assay less than 4 inches in diameter
High-frequency Analog Processing	4 channel analog front-end with programmable gain. 100 KHz per channel simultaneous sampling_with 12 bit A/D converter directly into DSP coprocessor.
Heading sensor	KVH digital compass with 0.5 deg accuracy (max)
Internal tilt sensors	2 orthogonally mounted Lucas Accustar clinometers sampled at 0.2 degrees resolution.
Array tilt sensors	Integrated 2-axis tilt sensor mounted in external pressure case at array midpoint.
Pressure sensor	0.1 percent of full scale
Temperature sensor	Platinum RTD with 0.01 deg C. accuracy
Battery Power	15 Volts. 4800 Watt-Hours capacity
Status and Housekeeping	Monitors battery voltage

TABLE VIII

Conditions and results of hose flex and tension fatigue tests.

TEST RESULTS	HOSE SAMPLE #1	HOSE SAMPLE #2
Min and Max Load	0–1,800 lbs	0–1,300 lbs
Load Cycle Duration	10 sec	9.5 sec
Elongation* at Maximum Load	50%	42.5%
Flex Angle	45°	25°
Duration of Flex Cycle	3 sec	2.5 sec
Fill Fluid Pressure at Max Tension	220 psi	105 psi
Load Cycles till Failure	4,152	9,878
Flex Cycles till Failure	13,781	39,546
Failure Type and Localization	Burst failure at end of steel coupling. Reinforcement intact.	¼" burst at taper of extra reinforcement hose; otherwise intact.

*Elongation measured in complaint section of test hoses at load cycle 100.

Having now described the invention in accordance with the requirements of the patent statutes, those skilled in this art will understand how to make changes and modifications in the present invention to meet their specific requirements or conditions. Such changes and modifications may be made without departing from the scope and spirit of the invention as set forth in the following claims.

I claim:

1. A method for collecting data in a large body of water, such as the ocean, comprising the steps of:

deriving an offset time interval related to source data to be transmitted;

transmitting an acoustic signal from an acoustic source delayed from a preselected transmission time by the offset time interval;

determining a measured arrival time at which the acoustic signal is received at a receiver, the travel time of the acoustic signal between the source and the receiver being distinguishably larger than the offset time interval; and

deriving the source data from the measured arrival time.

2. The method of claim 1, wherein the step of deriving the offset time interval further comprises the step of:

determining the source data related to a position offset between the acoustic source and a known anchor point.

3. The method of claim 2, wherein the step of deriving the source data further comprises the step of:

determining a difference between an estimated time of arrival of the acoustic signal at the receiver, based on a transmission at the standard time of transmission, and the measured arrival time.

4. The method of claim 2, wherein the step of determining the offset position further comprises:

determining a three dimensional position offset.

5. The method of claim 2, further comprising the steps of:

determining other data from the actual travel time by subtracting the offset interval from the measured arrival time.

6. The method of claim 2, further comprising the steps of:

determining the offset interval from a difference between an estimated time of arrival of the acoustic signal at the receiver, based on a transmission at the standard time of transmission, and the measured arrival time; and

determining other data from the actual travel time by subtracting the offset interval from the measured arrival time.