

XCP

EXPENDABLE CURRENT PROFILER AND MK 10 DATA ACQUISITION SYSTEM



ocean systems division



Sippican's Expendable Current Profiler (XCP) is the first expendable which provides real-time profiles of current speed, direction, and temperature to depths of up to 1500 meters in virtually any weather conditions. It is ideal for rapidly profiling an area of interest and for complementing the data obtained by hull-mounted and moored current measuring systems. Use of the XCP will also eliminate some of the problems encountered with traditional current measuring systems

such as the loss of expensive equipment and more importantly, the

inaccuracies caused by ship motion and mooring instability. The XCP requires no launcher; it can be easily deployed over the side of any surface ship by hand. The XCP is also available in a sonobuoy configuration for aircraft launch at speeds up to 180 knots and to altitudes of 2000 feet.

SYSTEM DESCRIPTION

The Sippican XCP MK 10 System consists of the MK 10 Digital Data Interface, a PC with a Keithley Metrabyte KPC-488.2 card, and an expendable current profiler. The MK 10 has been designed for PC compatibility with DOS v.3.3 or later. Up to three radio receivers, operating on the standard frequencies of sonobuoy channels 12, 14, and 16, may be fitted within the MK 10. The MK 10 is mounted easily in any 19" electronics rack.





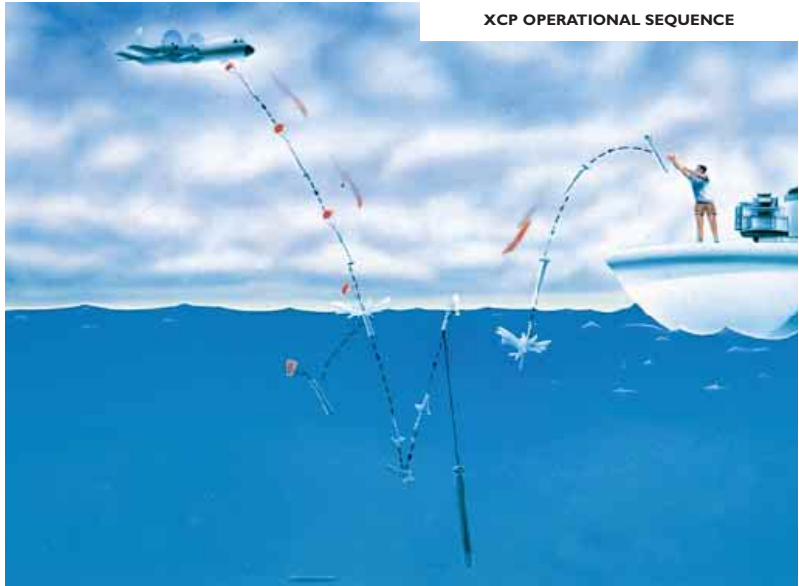
OPERATIONAL SEQUENCE

The XCP is deployed by hand over the side of any ship. A battery within the surface buoy activates upon water impact and quickly attains the operating voltage required to power the buoy electronics. Power is applied to the RF transmitter and to a timing circuit. The surface buoy releases the XCP probe after a forty second delay and data collection begins.

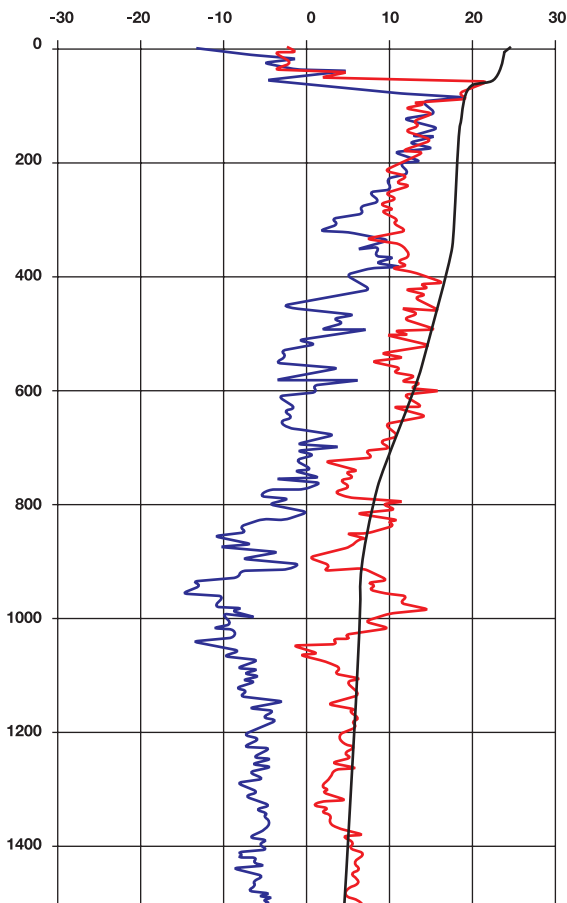
Ship operation is not restricted as probe data is telemetered via a radio frequency (RF) link to any receiver within line sight of the XCP's surface buoy. The MK 10 receives the radio frequency output of the probe in real time and converts the signal into digital format. The MK 10 then transfers the digitized XCP data over an IEEE 488 bus to the PC for further processing. The digitized data received by the PC is processed, stored and displayed in tabular or graphic form.

Up to eight parameters may be displayed including temperature and depth. A hard copy of the data may be obtained later using printing and plotting equipment.

After the probe has completed its descent, the RF transmitter disables and the entire buoy assembly scuttles, clearing the radio frequencies for the reception of additional profiles.



XCP OPERATIONAL SEQUENCE



XCP trace
— Temp
— V (North Velocity)
— U (East Velocity)

The color plot on the left displays three of the eight parameters provided by the XCP data acquisition and processing system; north velocity component (V); and temperature (Temp). The five other parameters include rotational frequency, electric-field baseline, magnetic compass baseline; area ("tilt" correction); and velocity error. For versatility in analyzing XCP data, plot scales may be expanded or contracted.

XCP SPECIFICATIONS

Horizontal Shear	
Current Accuracy	-3% RMS
Velocity Resolution	-1.0 cm/sec RMS
Vertical Resolution	0.3 meters
Temperature Range	0°C to +30°C
Temperature Resolution	0.2°C
Sampling Rate	16 Hz
Depth	1500 meters
Operating Frequencies	3, identical to US Navy sonobuoy channels 12, 14, 16

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