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Expendable Current Profiler (XCP) and MK10A Data Acquisition System Provides Real-Time Profiles of Current Speed, Direction, and Temperature



Expendable Current Profiler (XCP) and MK10A Data Acquisition System



Lockheed Martin'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 hullmounted 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

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sonobuoy configuration for aircraft launch at speeds up to 180 knots and to altitudes of 2000 feet.

Description

The XCP MK10A System consists of the MK10A Digital Data Interface, a PC and an expendable current profiler. The MK10A has been designed for PC compatibility with Windows. Up to three radio receivers, operating on the standard frequencies of sonobuoy channels 12, 14, and 16, may be fitted within the MK10A. The MK10A is mounted easily in any 19-inch electronics rack.

Operational Sequence

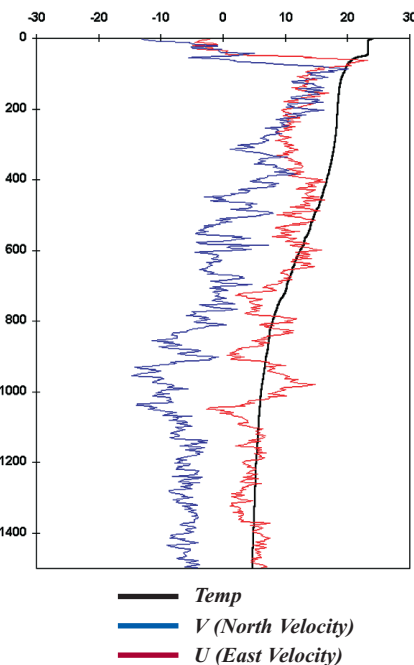
The XCP is deployed by hand over the side of any ship. A battery within the surface buoy activates upon water impact and quickly attains the operating voltage required to power the buoy electronics. Power is applied to the RF transmitter and to a timing circuit. The surface buoy releases the XCP probe after a 40 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 MK10A receives the radio frequency output of the probe in real time and converts the signal into digital format. The MK10A then transfers the digitized XCP data 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.

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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
Sampling Rate	3, Identical to U.S. Navy Sonobuoy Channels 12, 14, 16

XCP Trace

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.