Automated Antenna tracking of a Remote Controlled Minehunting Semi-submersible at sea

Canadian Navy

In 2007, the "Interim Remote Minehunting and Disposal System" (IRMDS) consisting of the Canadian built remote controlled 27' "Dorado" semi-submersible, and "Aurora" variable depth tow-body came into interim service in the Canadian Navy. The IRMDS system brings into service a state of the art sea mine hunting system developed under a **Defence Research and Development Centre Atlantic (DRDC-Atlantic**), **International Submarine Engineering (ISE)** and **MacDonald Detwiller and Associates(MDA)** project.

In order to keep naval personnel safe from any potential sea mine threat, the "Dorado" vehicle is remotely controlled at up to a distance of 8km from a nearby Naval vessel. A commercial Klein 5500 side scan sonar is mounted to the underside of the variable depth Aurora tow-body and provides real time sonar images of the sea floor, allowing the operator to locate and identify any potential sea mine threat.

An Ethernet bridge radio network is used to transmit the large volumes of side scan data to the operator. An accurate, real-time pan-tilt unit was required to point and steer directional antennae on the Naval vessel toward the Dorado vehicle. To satisfy this requirement, the **IRMDS** team turned to Directed Perception's **PTU-D300** model pan-tilt unit. Two low gain omin-directional antennae are used aboard the Dorado, while two directional, higher gain antennas are mounted on the PTU-D300 aboard the Naval control vessel. Due to the narrow beam widths of the directional panel antennae a highly accurate, stable and fast positioning system is required to track a moving vehicle at up to 8km range from a similarly moving vessel at sea.

The requirement to track a moving vehicle from another moving vehicle required integration of the **PTU-D300** into the Dorado command and control system using the **PTU-D300** built-in serial command protocol and inputs from the ship including: heading supplied via gyroscope and GPS position; and the Dorado vehicles GPS position which is transmitted back to the control ship over a VHF data link.

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Defence R&D Canada (DRDC) is an agency of the Canadian Department of National Defence responding to the scientific and technological needs of the Canadian Forces (www.atlantic.drdc-rddc.gc.ca). **International Submarine Engineering Limited (ISE)** designs, builds and integrates submersible vehicles (ROVs, AUVs) and robotic systems (www.ise.bc.ca). **MacDonald Detwiller and Associates(MDA) provides** innovative electronic solutions for complex customer requirements (www.mdacorporation.com).

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