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Kraft TeleRobotics Inc.

Predator II

Evolution in Force Feedback



SPECIAL OFFSHORE OIL & GAS REPORT

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Global Subsea Developments Forecast

Evolution—Predator II

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Kraft 6-DOF force feedback mini-master with console

Evolution is a great thing, it's what allows all species on planet Earth to adapt, survive and improve. At Kraft TeleRobotics evolution is also a great thing, it's the logical progression of Kraft product development based upon a history of proven performance. Evolution is what allows Kraft to stay at the forefront of manipulator system design, and keep pace with its customer's needs.

For over two decades Kraft TeleRobotics has demonstrated the ability to envision and deliver high performance manipulator systems which greatly enhance man's ability to perform work in the deep ocean environment. In keeping with a long tradition of technological innovation, Kraft has again moved forward in the evolutionary process with the introduction of its Predator II force feedback manipulator system.

As the next generation manipulator for deep ocean work, Predator II is the culmination of 20 plus years of experience and everything Kraft has learned from listening to its customers. At the heart of the Predator II system is a new 6 DOF force feedback mini-master controller, the vital link between the operator and the remote manipulator arm. Nothing is more important than the method of control, and the Kraft mini-master allows the operator to control complex manipulator motions in a comfortable and intuitive manner.



Hydrovision Venom ROV equipped with two Kraft Predator II force feedback manipulator arms



Team from Woods Hole group recently visited Kraft to have a look at their first Predator II force feedback manipulator system. From left to right: Jack Dell (Engineering Assistant / Jason), Bruce Strickrott (Mech. Section Leader / Alvin), Will Sellers (Chief Pilot / Jason) Anthony Tarantino (Pilot / Alvin)

Left or right-handed operators benefit equally from the mini-master's ergonomic design, and high fidelity force feedback greatly enhances operator awareness.

Predator II has been well received, with professionals from within the ocean sciences community, the telecommunications industry, and the offshore oil & gas industry all expressing their enthusiasm. The delivery of two force feedback arms to Hydrovision (cover photo) marks the sale of the first Predator II dual arm system. With an operational depth capability of 6500 meters, and force feedback to the operator,

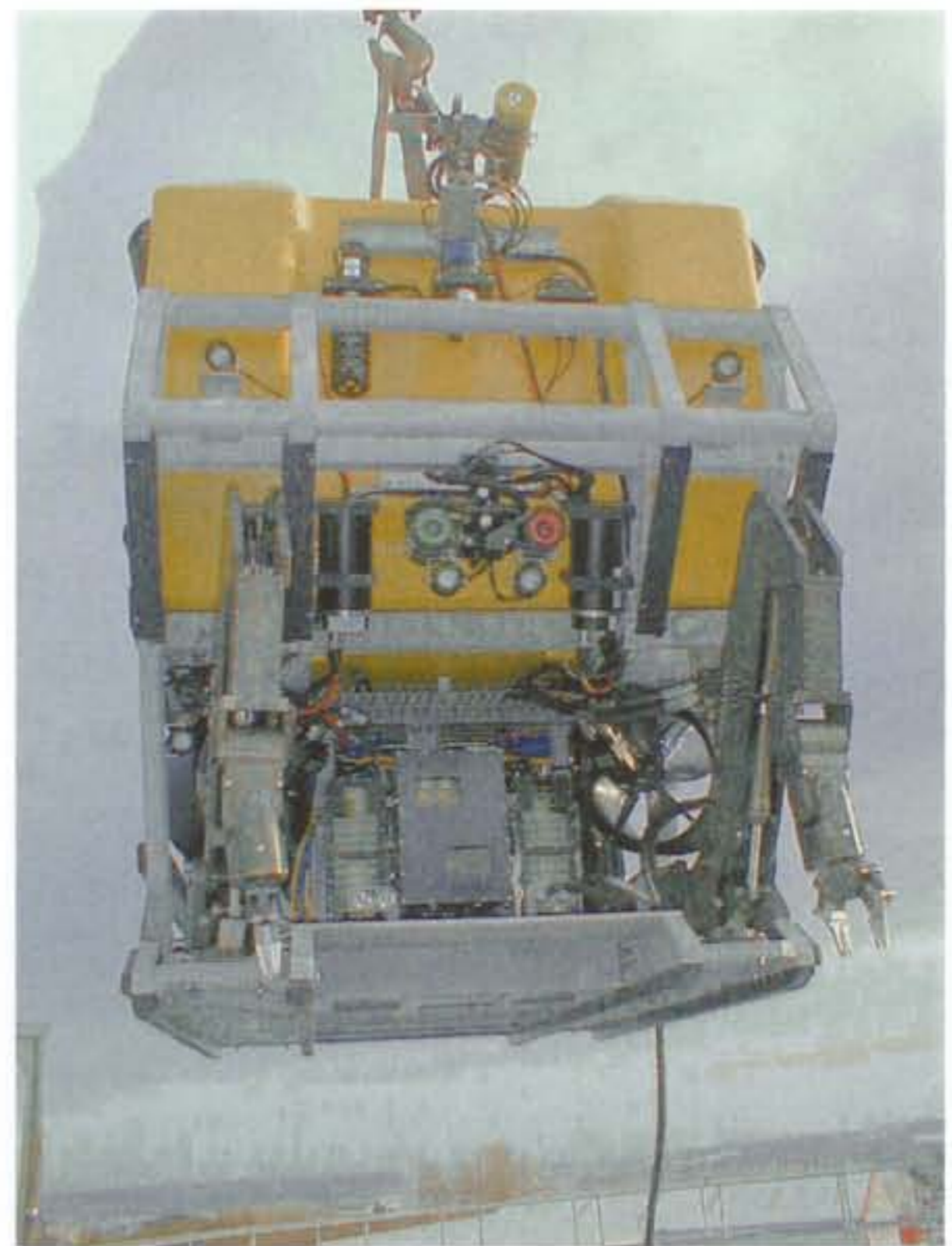


Mini-master in hand, Mr. Bernd Ocic of Ocean Frontier Services takes control of a new Kraft Predator II force feedback manipulator.

Predator II sales within the ocean sciences community have been very strong. At the recommendation of many of their colleagues and long time users of Kraft manipulator arms, the Woods Hole Oceanographic Institute and others have chosen to upgrade their deep diving ROV systems with Predator II force feedback arms. The deep diving submersible ALVIN will also soon be fitted with a Predator II force feedback manipulator.

Predator II is not a new creation, but rather the beneficiary of tried and field proven engineering. Performance, reliability, and serviceability have all been raised to a new level, and the result is all positive.

Several force feedback Predator systems will be delivered to WHOI for use on both the Alvin submersible and their new Jason II ROV. During their visit both groups were given the opportunity to put their new manipulator through its paces.



Front view of Venom ROV with Predator IIs

During acceptance trials at Kraft's facility in Overland Park, Mr. Ocic on behalf of NSW, put two Predator II systems through their paces. Having successfully completed these trials, the two new Predator II systems were delivered to Hydrovision in the UK for integration with NSW's new ROV / Cable Burial and Maintenance System.

NSW reportedly selected the Kraft Predator II manipulator for its reach and dexterity. During the evaluation process, however, it quickly became clear to NSW personnel that the intuitive nature of the Kraft control system, and the benefit of force feedback to the operator, were of major importance.

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