

ROBOT ARM

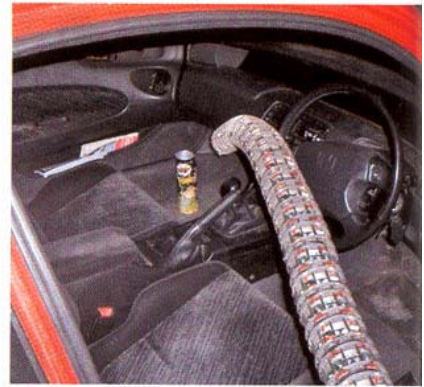
*presents the ultimate
in flexibility*

Bristol based **OCRobotics** has been working with the UK Ministry of Defence for a couple of years now to develop a new breed of robot that is capable of reaching into awkward spaces. Where a rigid-link robot is restricted by the 'elbows' in its arms, OCRobotics' new 'snake arm' can follow its nose to reach through small gaps and around narrowly spaced obstacles. The main project was to develop a snake arm robot that could be set to work on a remote vehicle. The arm itself had to be 2.5m long, be able to carry a payload of 25kg and have sufficient mechanical strength to tow a car.

During a demonstration, the device successfully reached

through one of the vehicle's open front windows to the back seat where an object was viewed via a tip-mounted camera. The arm is actually the cheapest part of the snake arm robot system, so should it be damaged during an operation, it can be replaced at relatively little cost. Indeed the arm is designed to be discarded if it becomes trapped or wedged, allowing the main system to return to the operator for a replacement.

A snake-arm robot is a bit like the human spine. It comprises a large number of vertebrae, tendon driven, with wires terminating at various points along the length of the arm. The result is that the curvature and plane of curvature of each



segment can be independently controlled. A motor is used to control the length of each wire independently, and control software calculates the necessary lengths of all the wires to produce a desired shape. OCRobotics has designed its own CAN enabled integrated intelligent amplifier servo controller for this distributed control application. All services are carried within the arm so that the external surface is smooth and continuous. The operator uses a joystick to drive the tip, while the computer does the maths to make the arm follow.

MORE INFO ENTER 214

DPA: Design Products and Applications July 2005