

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)  
Assembly and operation of space stations (3)

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DEXTRE -- THE ROBOTIC DREAM COMES ALIVE!  
SPECIAL PURPOSE DEXTEROUS MANIPULATOR (SPDM/DEXTRE) DEPLOYMENT AND  
ON-ORBIT COMMISSIONING RESULTS

**Abstract**

In the early 80s Canada imagined an integrated robotic system that could be used not only for assembly of an orbiting space vehicle but also for its maintenance, thereby increasing sustainability and reducing the need for time consuming and hazardous extra-vehicular sorties (EVAs). That time has come with the launch of the Special Purpose Dexterous Manipulator (SPDM), also called "Dextre", to the International Space Station (ISS) on March 11, 2008 aboard Shuttle Endeavour STS-123. Together with the Mobile Base System and Canadarm2, Dextre completes the Mobile Servicing System (MSS). This critical system, which has enabled assembly and crew-based external maintenance of the ISS since 2001, will now be capable of robot-based external maintenance of the ISS.

This paper describes some of the various early concepts for Dextre and the rationale for the final version which has become reality. An overview of the results of Dextre deployment and current on-orbit commissioning status is provided followed by a description of the innovative or unplanned operational uses made of Dextre since its' launch.

Finally, Dextre's potential for evolution from structured to unstructured on-orbit robotic maintenance tasks is presented, and its' role as a stepping stone towards enhanced human-robotic utilization is explored. This paper presents new technical and programmatic material for consideration as a Technical Oral Paper (Presentation model).