

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)

Human and Robotic Partnerships in Exploration - Joint session of the Human Spaceflight and Exploration Symposia (6-A5.3)

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EVOLUTION OF CANADA'S MOBILE SERVICING SYSTEM AND ITS IMPLICATIONS FOR SPACE
EXPLORATION

Abstract

Canada's "Canadarm" space manipulators – the original "Canadarm" on NASA's space shuttle, and "Canadarm2", (part of the Mobile Servicing System) Canada's contribution to the International Space Station – represent a thread of evolving space robotics capability going back 37 years.

The evolution of robotics capability, and the factors that contribute to it, in these systems are discussed and analyzed. Particular attention is paid to the technological, programmatic, environmental, and system design factors that enabled or impeded the expansion of the system capabilities. A parallel is drawn between this robotics evolution and Maslow's Hierarchy of Needs pyramid.

This evolutionary thread also runs into the future as requirements for "Canadarm3" are defined in support of renewed human exploration of cis-lunar space. The potential for deliberate shaping of the Canadarm3 design to facilitate on-going evolution and expansion of capabilities, including increased sustainability, ease of remote operation, and autonomy, is explored.