

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
Enablers for the Future Human Missions (7)

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A ROBOTIC SURGICAL ASSISTANT FOR ISS AND BEYOND

Abstract

As the number of human inhabitants in space grows and the duration and distance of remote crewed operations expands beyond LEO, the probability of an on-orbit crew health crisis increases. Presently, the operating concept for LEO based crewed missions such as shuttle and ISS relies on the rapid and assured return to Earth for the resolution of a health crisis. As a result, there are limited capabilities to handle the crisis on-orbit and a regular regime of health monitoring is conducted to minimize the probability of such a crisis. As the return to Earth becomes less rapid and less assured, the necessity for comprehensive health monitoring and the capability to handle an unexpected health crisis on-board becomes unavoidable. Solutions include the addition of an on-board medical officer but an alternative solution could follow the pattern of remote tele-health and telesurgery that is being developed for remote and sparsely populated parts of large countries such as Canada and Australia. In this development, the specialized skills of a surgeon or clinician are transferred to a remote community via real time visual and data communications and a robotic assistant located with the patient. This paper examines the role in which a portable robotic surgical assistant may play in the day to day health monitoring and maintenance of a remote crew as well as the performance of life saving surgical tasks in event of an unexpected crisis. A concept to demonstrate the essential functions for such an assistant on the ISS is proposed.