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INTERNATIONAL SPACE STATIONS COMMUNICATION SYSTEM TO THE EARTH : THE EUROPEAN DATA RELAY SYSTEM FOR THE ASTRONAUTS ON ORBIT.

Abstract

The futur mission to the Moon with the Artemis I puts on the table the communication system with Earth. The International Space station provides the state of the art how astronauts shall communicate to the ground from the Moon too. Moreover, the New Space stations incoming on orbit need to integrate them in the architecture system on the ground and in Space. The mission control facilities in Russia, United Kingdom, and in Germany as the European data relay satellite on orbit are the basis of this communication system in Space for the astronauts missions. The Columbus laboratory Ka-band terminal and the signal management back to the European base station represent the proof of concept for the Artemis mission, with the need to built around the Lunar Gateway, a full communication system. The direct link to the Earth is not enough considering how the astronauts communicate with the ground segment on Earth. The futur architecture includes new parameters in regard of the distance, the stability of data exchange for long term missions, the redundancy of relay in the Moon orbit and in its ground with the first facilities. Following these requirements, the framework of cybersecurity in Space should add key controls to maintain the safety and the security of data communication and transmission.