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SPACE-TO-GROUND COMMUNICATION FOR COLUMBUS: A QUANTITATIVE ANALYSIS

Abstract

The astronauts on-board the International Space Station (ISS) are only the most visible part of a much larger team engaged around the clock in the performance of science and technical activities in space. The bulk of such team is scattered around the globe in five major Mission Control Centers (MCC), as well as in a number of smaller payload operations centres. Communication between the crew in space and the flight controllers at those locations is an essential element and one of the key drivers to efficient space operations. Such communication can be carried out in different forms, depending on available technical assets and the selected operational approach for the activity at hand. This paper focuses on operational voice communication and provides a quantitative overview of the balance achieved in the Columbus program between collaborative space/ground operations and autonomous on-board activity execution. An interpretation of the current situation is provided, together with a description of potential future approaches for deep space exploration missions.