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SIMULATION FRAMEWORK FOR ASTRO CASCO, AN INTEGRATED AND ROBUST
TELEMETRY TRANSCEIVER AND DATA PROCESSING SYSTEM FOR ANALOG SPACE
MISSIONS

Abstract

Astro Casco is an integrated system for telemetry transmission/reception for analog space missions. It uses COTS for achieving long distance communication that improve the astronauts' safety by enabling, for example, Mission Control Center's awareness during Extravehicular Activities (EVAs).

The software inside Astro Casco Receiver (ACRX), Astro Casco Repeater (ACR) and Astro Casco Data Processor and Transmitter (ACPTX) defines how the data is packed, transmitted, relayed, received, unpacked and interpreted. The way in which these processes are done have a measurable impact on the performance of the system as a whole.

We have created a simulation based methodology to validate the algorithms used for data processing, transmitting and reception in the Astro Casco software. These simulations focus on key controlled parameters such as period between messages, processing time, number of transmitters, number of repeaters and link budget; and key measurable parameters such as received signal strength indicators and packet loss rate.