EVA Link System Needs Statement

**System Needs Statement**

There are three system needs. First, the safety of analog astronauts on EVA needs to be improved. Analog astronauts on EVA may lose other communications methods, which limits potential operations and creates crew risk. Second, analog crews need to collaborate in real-time with other users, outside of and remote to the space analog, with a high degree of fidelity. Third, analog crews need access to improved on-mission information about analog astronaut location and status, EVA points of interest, EVA planning and simulation, and operational activities.

**System Needs**

The specific needs enumerated for the system design are as follows:

1. Digital network in the field that can supplement existing Ham-class radio amongst analog astronauts on EVA, and between astronauts on EVA and those in the MDRS hab.
2. Digital network must be able to overcome terrain challenges which cause significant radio shadows. It must be able to cover any arbitrary area or extent of the MDRS operational region, and it must not require any form of permanent installation.
3. Support for real-time coordinated field science between analog astronauts on EVA and remote users in a virtual reality replica of the MDRS environment.
4. The ability to capture, log, and share basic telemetry on analog astronauts and their EVA environment, such as temperature, position, and orientation.
5. The ability to replay prior analog EVA excursions for lessons learned, training, and analysis.
6. The ability to research, plan, and rehearse EVA excursions prior to donning analog space suits and exiting the hab.
7. The ability to easily document field science collections in real time that also leverages and integrates system telemetry.
8. Technical support in simulation for analog astronauts by remote support staff who are outside of simulation.