

## HUMAN EXPLORATION OF THE SOLAR SYSTEM SYMPOSIUM (A5) Human Exploration of Mars (2)

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### MARS DESERT RESEARCH STATION: CREW 138

#### Abstract

Crew 138 was comprised of a team of highly-skilled professionals with varied backgrounds who were selected by the Mars Society to undertake a two-week interdisciplinary expedition at the Mars Desert Research Station near Hanksville, Utah. The Crew's activities ranged in scope from preparing operational handbooks and checklists for the Mars Desert Research Station, performing hardware and logistical evaluations for future research at MDRS, an analysis of Google Earth as a tool for geological field mapping, evaluations of commercial-off-the-shelf engineering and electrical components, the design of a Mars EVA work day functional task battery, and assessing the viability for incorporating an exercise countermeasures hardware and program into the Mars Desert Research Station.

The primary objectives of the Crew 138 expedition were as follows:

- Develop operational handbooks and checklists for Mars Desert Research Station
- Assess the viability for integrating exercise countermeasures hardware and an exercise countermeasures program into the Mars Desert Research Station
- Develop a proof-of-concept Mars EVA Work Day functional task battery Engineering hardware evaluation of a variety of biomedical monitoring devices
- Logistical analyses for future biomedical biological research at MDRS
- Extravehicular activity (EVA) reconnaissance techniques
- Investigate varying degrees of crew autonomy and its effect(s) on efficiency and productivity during EVA
- Evaluate accuracy of Google mapping of remotely sensed imaging
- Photography and videography of expedition
- Facilitate educational and public outreach activities

Crew 138 performed 8 EVA sorties focusing on extravehicular activity reconnaissance techniques, the accuracy of Google mapping of remotely sensed imaging, EVA task performance, and crew autonomy during EVA. All EVAs produced useful information and pilot data.

Crew 138 contributed the following services to the habitat:

- Conducted a comprehensive food inventory for MDRS.
- Performed a thorough evaluation and inventory of the medical supply cabinet.
- Developed an electronic medical supply inventory tracking spreadsheet.
- Completed an aerial mapping project of the MDRS area by quad copter.
- Repaired EVA backpacks leaving 4 of 6 fully operational.
- Assisted with the temporary repair of the Engineering Bay Airlock deck/porch.
- Washed habitat SUV exterior and cleaned interior.
- Deep-cleaned the habitat and organized the common work and leisure areas.
- Removed a large quantity of accumulated material from both inside and outside the habitat left from previous MDRS crew.