The Role of Technology in Field Exploration and Astronaut Training

Summary of the Field Exploration and Analysis Team (FEAT) Session at the 2007 LEAG Workshop: "Enabling Exploration: The Lunar Outpost and Beyond"

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FEAT Near-term Goals

- Provide a venue for field geologists to contribute to preparations for lunar field work
- Foster communication between field geoscientists and field technologists
- Assist in the development of a field geologic training program
- Capture wisdom of Apollo Program veterans
- Recruit young field geoscientists for future work

FEAT at LEAG

Thursday PM oral session:

- Apollo: Lessons Learned
  - Dean Eppler – Astronaut interviews
  - Gary Lofgren – Apollo training perspectives
- Astronaut Training
  - Duane Ross – Astronaut geology and geophysical training
- Technologies Associated With Lunar Field Work
  - Jake Maule – Robotics field testing
  - Brian Wilcox – Lunar surface mobility – mobile lunar landers
  - Charles Weisbin – Gauging efficiencies of robotic vs. human field work

Apollo Field Geology Training: Lessons Learned (Eppler, Lofgren, Ross) – Part 1

- Train together (astronauts, back-room scientists, Capcom, HQ personnel, and engineers)
- Field trips to analog sites as well as other interesting localities (volcanic fields, impact sites, etc.)
- Focus on problem-solving
- Develop a common language, emphasize clear and accurate communications in regard to geologic features and rocks
- Find mentors that can relate to the astronauts
- Include geophysical field techniques and data analysis in the training

Apollo Field Geology Training: Lessons Learned (Eppler, Lofgren) – Part 2

- Train astronauts to observe detailed field relationships (e.g., contacts within boulders, overall geologic context)
- Use potential analytical tools in the field (analog demonstrations)
- Have astronauts interact with robotic systems during training
- Importance of debriefing field trip after initial study of an area

Observations About Field Technologies

- Keep it simple, but scientifically useful
- Relieve astronauts of detailed sample documentation by employing new technologies
- Use potential analytical tools in the field during training (e.g., hand-held XRF, portable Raman spectrometer, digital microscopy)
- Importance of the work bench and rock splitter near the habitat for sample high grading
- Use of telepresence technology in field training