

touching one of the ends provides additional shadow shielding.

*This work was done by Bruce Banks of Glenn Research Center. Further information is contained in a TSP (see page 1).*

*Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steve Fedor, Mail Stop 4-8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-18016-1.*



### Hybrid Mobile Communication Networks for Planetary Exploration

A paper discusses the continuing work of the Mobile Exploration System Project,

which has been performing studies toward the design of hybrid communication networks for future exploratory missions to remote planets. A typical network could include stationary radio transceivers on a remote planet, mobile radio transceivers carried by humans and robots on the planet, terrestrial units connected via the Internet to an interplanetary communication system, and radio relay transceivers aboard spacecraft in orbit about the planet. Prior studies have included tests on prototypes of these networks deployed in Arctic and desert regions chosen to approximate environmental conditions on Mars. Starting from the findings of the prior studies, the paper discusses methods of analysis, design, and testing of the hybrid communication networks. It identi-

fies key radio-frequency (RF) and network engineering issues. Notable among these issues is the study of wireless LAN throughput loss due to repeater use, RF signal strength, and network latency variations. Another major issue is that of using RF-link analysis to ensure adequate link margin in the face of statistical variations in signal strengths.

*This work was done by Richard Alena of Ames Research Center; Charles Lee of QSS Group, Inc.; Edward Walker and John Ossensfort of Foothill-De Anza; and Thom Stone of Advanced Management Technology, Inc.*

*Inquiries concerning rights for the commercial use of this invention should be addressed to the Ames Technology Partnerships Division at (650) 604-2954. Refer to ARC-15245-1.*