GALILEO EM-2 CONTRIBUTIONS TO THE LUNAR CONTROL NETWORK;
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A local control network is being developed using Galileo images that cover the region north of the Apollo area and lie between 10 and 100 degrees east longitude. This network is tied to the Apollo control network and will have a positional accuracy of approximately 500-1500 m. This region has been photographed by Earth-based telescopes and the Mariner 10 and Lunar Orbiter spacecraft, but the Galileo images are preferred for control because of their superior viewing angles, resolution, and Galileo's geometrically stable sensor.

Based on Davies et al., 1987, the positional accuracy of the near-side Apollo network is estimated to be between 50 and 300 m. The laser ranging retroreflector locations at the Apollo 11, 14, and 15 sites and the Lunikhod 2 site have been determined with an accuracy of about 10 m. (Williams et al., 1987). The locations of the ALSEP transmitters relative to the retroreflectors have also been measured (King et al., 1976). These known coordinates are used to estimate errors in the Apollo network.

The telescopic control is approximately bounded by 75 degrees north and south latitude and 75 degrees east and west longitudes. The accuracy of the telescopic network is thought to be about one to two km. Thus, the Galileo network might improve coordinates in the telescopic area as well as north and east of it.

References

(1) Davies, M.E. et al., 1987, JGR 92, 14177-14184.
(2) King, R.W. et al., 1976, JGR 81,6251-6256.
(3) Williams, J.G. et al., 1987, Proceedings of the International Symposium, Figure and Dynamics of the Earth, Moon, and Planets, Astronomical Institute of the Czechoslovak Academy of Sciences, 643-648.