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**THE CONTROL NETWORK OF MERCURY: APRIL 1991**Merton E. Davies and Patricia G. Rogers  
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Features identified on Mariner 10 high-resolution images of Mercury, acquired during three flybys between 1974 and 1975, form the basis of Mercury's planetwide control network. Although images from all three flybys are used in the net, the large amount of contiguous coverage from the second flyby, a southern bright-side pass, make these images the strongest contributors to the control net.

Mercury is in synchronous rotation with a period of 58.6462 days and its spin axis is approximately normal to the equatorial plane. The 20° meridian is defined by the crater Hun Kal, located just south of the equator (Murray, et al., 1974; Davies and Batson, 1975).

The control network computations involve the photogrammetric determination of control point coordinates and an analytical triangulation solution. The current control network computations for Mercury are performed in the J2000 coordinate system according to the International Astronomical Union (IAU) convention. In recent years, updates to the control network have included improved trajectory solutions (Anderson, et al., 1987) and modification of the standard radii (2439 km) at several points based on Earth-based radar altimetry data (Harmon, et al., 1986).

The following represents the current status of the control network calculations:

Points	2406
Pictures	811
Observation Equations	26,240
Normal Equations	7,245
Overdetermination	3.62
Standard Error ( $\mu\text{m}$ )	21.46

Improvements have been made to existing control points and new control points have been added to the net to strengthen the overall network and improve the standard error of measurement.

**References**

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