



Fig. 8. Lination map of central Uruk Sulcus. North is up.

The crater-density data displayed in Figure 11 may be used to test two alternative models of local-scale grooved terrain stratigraphy, namely that of *Golombek and Allison* [1981] and that proposed in this study. *Golombek and Allison* (Figure 2) suggested a sequence of formation of the surfaces of (1) "primary grooves" (throughgoing groove lanes), (2) "secondary grooves" (short groove lanes), and (3) "tertiary grooves" (grooved and resurfaced polygons). This corresponds to a sequence of (1) unit F, (2) groove lanes dominating units D and E, and (3) units B and C and the few grooved polygons in units D and E. The role of reticulate to hummocky terrain (unit A) in grooved terrain evolution was not specified. In examining the cumulative densities of craters greater than 2 km in diameter, in Figure 11, it is seen that the surfaces of units D, E, and F are younger than the surfaces of units B and C. This result is inconsistent with the sequence predicted by *Golombek and Allison* [1981].

In contrast, the cumulative densities of craters greater than 2 km and 5 km in diameter in the mapped relative age units suggest three major age groups, unit A, units B-C, and units D, E, and F. These major groups are consistent with the sequence of major age groups determined from geologic mapping, and with

the sequence of events proposed in our revised model of grooved terrain emplacement. Cumulative densities of craters greater than 5 km in diameter clearly show that unit A is older than the other grooved terrain units. The cumulative densities of craters greater than 2 km in diameter show that units B-C are older than units D, E, and F, and that unit D probably is older than unit E. Reticulate to hummocky terrain outlined by throughgoing grooves and fracture zones (unit A) corresponds to stage 1 of the revised model, dissection of the lithosphere by throughgoing grooves into large polygons that have been pervasively deformed. The formation of intermediate-age grooved polygons (units B-C) is consistent with stage 2 of the model, which is areally extensive resurfacing and continued deformation of the polygons. The youngest tectonic features (units D, E, and F) are mostly groove lanes superposed on the margins of grooved polygons, although a few grooved polygons belong to these relative age units. The formation of these groove lanes is consistent with stage 3 of the model, which is repeated groove lane formation dominated by reactivation of the zones of weakness outlining the grooved and resurfaced polygons.