NEW GEOLOGIC MAPS OF THE URANIAN SATELLITES TITANIA, OBERON, UMBRIEL AND MIRANDA. S.K. Croft. Lunar & Planetary Laboratory, University of Arizona, Tucson, AZ 85721.

New geologic maps of four of the uranian satellites have been prepared using the new USGS polar stereographic base maps. The major unit on Titania is the cratered terrain. It is subdivided into heavily cratered and less cratered subunits. The less cratered units are annular bands around the large craters Ursula and Gertrude, and are interpreted as their continuous ejecta blankets. A set of sinuous ridges similar to the ridges near the crater Anchises on Dione run E-W near Gertrude. The rift-like major canyons include both NW-SE and NE-SW trending components. All of the canyons are fresh in morphology and post-date nearly all other structures. A set of graben-like lineaments run NW-SE across much of the visible hemisphere in a pattern reminiscent of the lineament systems on Rhea. The global areal expansion calculated from the lengths and depths of the extensional features is about 0.7%. The major geologic unit on Oberon is also a heavily cratered unit. No subdivisions were detected, probably as a result of much lower resolution in the available images. A dark unit occurs in and around craters near Macbeth; the pattern is reminiscent of the volcanic deposits of Mare Australae on the Moon. No ridges comparable to Titania's were found. Oberon's canyon system includes both degraded and fresh components. The younger canyons(which post-date the large rayed craters) are narrower than the older, heavily cratered canyons. A NW-SE trending set of lineaments is also found. The areal expansion represented by Oberon's old canyons is about 0.5%, and about 0.4% for the young canyons. Both Titania and Oberon have been resurfaced(1), both have similar tectonic regimes and similar absolute expansions. Thus the new mapping indicates that these two satellites are geologically more similar than previously thought(2). The major geologic unit on Umbriel is a heavily cratered plain. Bright deposits occur on the floor of the crater Wunda and on the central peak of Vuver. Crater rays are much less prominent on Umbriel than on either Titania or Oberon. The orthographic projection shows that a set of light streaks near Wunda are sub-radial to that crater and may be its rays. Umbriel also has a set of extensional canyons, trending NW-SE. Definition is poor, but there seems to be both degraded(E of Wunda) and fresh(N of Alberich) canyons. The canyons near Alberich apparently extend through the limb profile of (3), accounting for one of the major limb features. A set of mesa-like features is mapped near Malingee. These features are shaped and truncated by both canyons and craters. They are very poorly defined, but seem to coincide with some of the "umbral polygons" of (4), and thus may be real. Nearly all of Umbriel's surface features are morphologically subdued. This impression becomes even stronger when the best images of Umbriel and Oberon (at nearly the same resolution) are compared: the features on Oberon are simply more crisp. It is speculated that this may be due to some type of physical blanketing by ejecta from a major impact in the unseen hemisphere, or some type of volcanic fallout. In any case, Umbriel is tectonically more active than previously thought, consistent with the crater statistics(1) and subtle albedo variations (4) suggesting extensive volcanic activity. The tectonic patterns on all three of these satellites are remarkably similar. The extent of endogenic resurfacing also appears to be global on all three. The new map of Miranda is also included, though aspects of its geology have been discussed elsewhere(5).

REFERENCES. 1.Strom, R.G.(1987) ICARUS 70,517. 2.Smith B. et. al. (1986)Science 233, 43. 3.Thomas P.C.(1988)ICARUS 73, 427. 4. Helfenstein P. & J. Veverka (1988)LPS XIX, p. 475. 5. Croft S.K. (1988)LPS XIX, p. 225 and references therein.