THE CARSON QUADRANGLE, VENUS; R. Greeley, K. Bender, Arizona State University, Tempe, AZ, 85287, D. Senske, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, J. Guest, University of London Observatory, London, NW7 4SD.

Over 75% of the surface of Venus is dominated by plains and lowlands at or near the mean planetary radius [1]. These regions are composed of lava deposits interpreted to be mainly basaltic [2] and contain a wide variety of volcanic features [3,4]. Understanding the mechanisms of plains formation is important for understanding the geologic evolution of the Venusian surface. To assess the modes of volcanism and to constrain local and regional stratigraphic relationships, the Carson Quadrangle (Fig. 1) is currently being mapped in detail.

Units are defined based on their texture, homogeneity, and presence of features such as fractures, small shields etc.. In many cases unit contacts are distinct and well defined by cross-cutting and superposition relationships. Additional factors used to characterize units are their radar properties, including rms slope, reflectivity, emissivity, and relationships to topography. The Magellan radar viewing geometry is important for interpreting the characteristics of surface units. Radar incidence angles for the Carson Quad range from 46° at the equator to 35.5° at 25° S latitude. Consequently, the returned signal is strongly modulated by surface roughness on the scale of a few tens of centimeters; units defined as "radar-bright" are generally rough while "radar-dark" units are smooth. Results from examining the radar scattering properties of Carson units are presented elsewhere [5].

From preliminary mapping eleven major units have been identified, the most recent of which correspond to isolated volcanic centers, shield fields, and material associated with impact craters. Volcanic constructs >100 km across and ~1.0 km high consist of radar-bright material, radar-dark material and associated digitate lava flows that are superposed on the surrounding plains. Concentrations of smaller (~2 km diameter and greater) volcanic centers cluster in shield fields. These features and their associated deposits form locally radar-mottled surfaces whose boundaries with adjacent units range from distinct to diffuse. Other recent localized volcanic deposits, lava flow fields are made up of digitate, radar-bright and -dark deposits, some of which are associated with faults and fractures. Reticulate plains contain numerous sinuous ridges and have a moderate, homogeneous radar backscatter and few identifiable lava flow lobes. A major ridge belt cuts the reticulate plains as a deformation zone rising to an elevation >300m and composed of ridges spaced 10s of km apart. South of Heng-o, the reticulate plains embay a region of lineated plains; a unit with a homogeneous radar backscatter that contains abundant fractures which in some places form a gridded pattern. Closely related to this unit and located on a broad topographic rise to the west of Alpha Regio is a fracture belt. This deformational zone is 10s to 100s of km wide and is made up of linear, parallel fractures spaced from several to 10s of km. The most abundant plains are undivided, a large, homogeneous unit lacking ridges or lineations. The oldest unit, complex ridged terrain at Alpha Regio, contains ridges and fractures with multiple directions of deformation. Alpha Regio is rough at the 12.6 cm radar wavelength, and is extensively embayed by adjacent plains units. Two types of impact related units are mapped. Crater material form radar-bright, often lobate deposits extending .25 to 1 crater radii from the edge of inferred impact craters; in some places, the distal parts of the deposits appear to form flows. Diffuse deposits are localized, annular regions of bright or dark material that is typically centered on impact craters (in some places no crater is present and they form "splotches" [6]).

Stratigraphic relationships among units in the Carson Quad show that the most recent volcanic activity is associated with isolated volcanic edifices, lava flow fields, and shield fields. Earlier episodes of volcanism resulted in the emplacement of regional plains units, some of which are highly fractured. The earliest activity corresponds to the formation of complex ridge terrain in Alpha Regio.

Carson Quad, Venus; Greeley et al.

References. [1] Ford, P. G. and G. H. Pettengill (1992) *JGR., 97,* 13103. [2] Florensky, C. P., et al. (1977) *GSA Bull, 88,* 1537. [3] Guest, J. E., et al. (1992) *JGR, 97,* 15949. [4] Head, J. W., et al.(1992) *JGR, 97,* 13153. [5] D. A. Senske, et al.(1993) LPSC Abst. this issue. [6] Schaber, G.G., et al. (1992) *JGR, 97,* 13,257.

Fig. 1 General geologic sketch map of the Carson Quad.