RADAR IMAGING AN1) 'J'01'()(;I{41'11} OF THARSIS, 01 YMPUS MONS, AND ALBOR '1'1101,1S; R.F.Jurgens[1],M. A Slade[1] and A 1 '. ('. Haldemann[2], [1]JPL/Caltech, Pasadena, CA 91109, [2]Division of Geological and Planetary Sciences, Caltech, Pasadena, CA 911?5.

The 1995 Mars Opposition provided coverage of a range of latitudes not covered by 3.5-cm radar during any previous Mars' close stapproach sub-Earth latitudes between 16° N. and 22° N. Thus this opposition presented the opportunity to examine the Tharsis/Olympus region and other highland areas at new latitudes for ground-based Goldstone radar. 1 lowever, the analysis of delay-lkqq)lcl. radar data in mountainous terrain requires a more complicated fitting process than for the lowland planitiae that are mostly flat plains. Two special difficulties must be dealt with:

1. the rapid change in elevation makes it difficult 10 position the rather narrow range window on the specific surface
2. tile large. slope reflects most of the signal power to directions other than back to the radar.

The first problem can be eliminated I)) using a short ranging code M) that all possible range gates can be decoded while accepting a greater aliasing in range. The second problem requires introducing an offset angle into the analysis that accounts for the slope. However, the signal to noise ratio may be so reduced, and the range of the surface moving so rapidly that further signal averaging is not possible without smearing the measurements. Because of these difficulties, the measurements Of the Fresnel reflection constant, the 1 lag fors scattering constant, and the range 10 the surface. are less certain than for the landing sites. Still, the accuracy of the ranging measurements, where possible, provides better large scale altimetry than currently available in the USGS 1 Digital Terrain Model.

Table 1 shows the latitude and longitude coverage associated with each track and indicates the regions covered. Albor Tholus is covered on the track on Dec. 4,] 994. Olympus Mons and associated region is covered (m three separate days at slightly different latitudes. The Lunae Planum region is covered 011 two days. In general, the reflectivity is higher in the highland areas except for the region around Olympus Mons and into Amazonis. Heavily cratered terrain tends to show the greatest reflectivity with only mo **141,111** roughness. Some areas have both large roughness and very low reflectivity making accurate measurements nearly impossible.

Date	Longitude (deg.)' Begin	End	Latitude (deg.)	Locations at high snr	Type
04 Dec 94	178.4	23[illegible]	21.62	Elysium/Albor	R
11 Dec 94	118.0	176.0	21.76	Olympus /Amazon	R
18 Dec 94	56.8	108.5	21.80	Lunae Planum	R
08 Feb 95	216.2	325.6	18.83	Elysium/Arabia	R
19 Feb 95	105.5	207,4	17.89	Olympus Mons	R
26 Feb 95	60.6	151.7	17.35	Lunae Plan/Oly	R
03 Mar 95	35-/.3	105.5	1'/ .(18	Xanthe	CW
23 Mar 95	136.1	252.6	16.93	Elysium	R

'l'All] .EI: Dates and locations of radar tracks on Mars discussed