CONTROL NETWORKS OF THE GALILEAN SATELLITES: SOLUTIONS FOR SIZE AND SHAPE. M. E. Davies[1], T. R. Colvin[1], P. Thomas[2], J. Veverka[2], M. J. S. Belton[3], J. Oberst[4], W. Zeitler[4], and G. Neukum[4], [1]RAND, 1700 Main Street, Santa Monica CA 90407-2138, USA, [2]Cornell University, Ithaca NY 14853, USA, [3]National Optical Astronomy Observatories, Tucson AZ 85726, USA, [4]Deutsche Forschungsanstalt fur Luft- und Raumfahrt e.V., 12489 Berlin-Adlershof, Germany.

Galileo images are being added to the control networks of the large satellites of Jupiter. This is a continuing effort. Pixel coordinates of control points are measured on the images and their cartographic coordinates (latitude, longitude) are computed by analytical triangulation. Mean radii are computed by treating them as variables in the computations. These solutions are frequently used when producing maps because a sphere can be projected into many useful formats.

The hydrostatic shapes of the satellites are triaxial ellipsoids. These figures should be better approximations of the satellites' shapes than the spheres. However, ellipsoids lose most of the elegant transformations and projections that are available to the sphere and spheroid.

The sizes of the satellites are computed in two formats. The triangulation is first computed solving for the mean radius of a best-fit sphere, then as an ellipsoid in hydrostatic equilibrium. The tesseral moments (C_{22}) of Io and Ganymede have been measured by the Galileo Radio Science Team and the Love numbers (k_2) were derived from them. Europa and Callisto were assumed to have uniform densities and were assigned $k_2 = 1.5$.

References: [1] Anderson J. D.et al. (1996) *Science, 272,* 709–712. [2] Anderson J. D. et al. (1996) *Nature,* accepted for publication.

TABLE 1. Summary of the control networks of the Galilean satellites.

	Io	Europa	Ganymede	Callisto
Pictures	264	127	303	292
Points	711	224	1882	847
Measurements	6269	2035	12878	7944
Mean Radius	1817.5 ±3.7 km	1560.5 ±6.4 km	2633.7 ±2.3 km	2408.7 ±6.9 km
k_2	1.307	1.5	0.801	1.5
a	1825.9 km	1562.7 km	2634.7 km	2409.0 km
b	1815.1 km	1559.8 km	2633.3 km	2408.6 km
c	1811.6 km	1558.8 km	2632.9 km	2408.5 km