Memorandum

Honeywell Technology Solutions, Inc.
Lanham, Maryland

Date: September 20, 2007
To: Distribution
From: Jim Long
Subject: Results from 2006 TLRS-4 Calibration Survey

The recent geodetic survey was performed at the TLRS-4 site adjacent to the MEES Observatory, located at the University of Hawaii's Haleakala Observatories on the island of Maui, Hawaii. A prior site geodetic survey was conducted in March 2005 during the close out of the University of Hawaii's LURE Observatory (HOLLAS). The 2006 TLRS-4 geodetic survey was conducted during August and September of 2006. The survey efforts included: the determination of the TLRS-4 eccentricities, the calibration target data, and local ties to the University of Hawaii's HOLLAS system and the permanent GPS station "MAUI". The TLRS-4 mount was installed over a brass survey disk (T4 Disk, SLR 7119) set into the concrete pad. The existing concrete pad had been modified for the TLRS-4 system, deployed to the site in September 2006 from the Goddard Space Flight Center in Greenbelt, Maryland.

Survey data were obtained with precise Leica electronic survey instruments utilizing precise survey methods and techniques. The survey data was adjusted using the network adjustment software HAVAGO. The coordinates for the station SLR 7210 "LURE Sta. Bolt" (DOMES No. 40445M001), as listed in the ITRF 2000 (1997.0) solution were held fixed in the HAVAGO adjustment.

Station Position

The TLRS-4 mount was installed over the T4 Disk survey mark (SLR 7119). The coordinates for SLR 7119, listed below, are from the results of the adjustment and are referenced to ITRF 2000 (1997.0). The geodetic coordinates are referenced to the GRS80 ellipsoid with the constants: A=6378137.0 and 1/f = 298.2572221.

GEODETIC COORDINATES

STATION	LATITUDE	LONGITUDE	HEIGHT(M)
SLR 7119	20° 42′ 23.35133″ N	156° 15′ 24.89781″ W	3056.277
		203° 44′ 35.10219″ E	

CARTESIAN COORDINATES

STATION	X (M)	Y (M)	Z (M)
SLR 7119	-5466065.386	-2404338.833	2242107.973

TLRS-4 SYSTEM ECCENTRICITIES FROM SLR 7119

ΔN	ΔE	ΔUP
+0.001	+0.002	+2.632

ΔX	ΔY	ΔZ
-2.253	-0.993	+0.932

The following is the calibration data for TLRS-4. Calibration Pier A is the primary calibration target.

TLRS-4 CALIBRATION DATA

TARGET / PRISM	RANGE (M)	AZIMUTH	ELEVATION ANGLE
Pier A / 94-3	88.845	014.155°	+5.369°
Pier B / LTN 90-K	125.635	034.942°	+6.280°

Conclusions and Remarks

Prior to the August 2006 TLRS-4 survey, a close-out survey for the University of Hawaii LURE Observatory (HOLLAS) was performed in March 2005. The survey data from that survey has been combined with the August 2006 survey data for this HAVAGO adjustment.

If there are any questions concerning this survey or the calibration data, please contact me at (410) 964-7435.

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Geodetic Surveyor

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TLRS-4