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LUMINARY Memo #116

To: Distribution

From: L. Berman

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Subject: ACB #L5/120 - Operation of Rotation Control

The rotation control sequence used to prevent the body x-axis from pitching through the downward vertical was written on the assumption that UNFC/2 was a unit vector. The unitizing operation was deleted from Luminary since FINDCDUW does it anyway. The formula used for release is:

$$\overline{A}_T \times 2^9 \cdot \overline{X}_{NB} \times 2^{-1} > \cos\theta_C \times 2^{-2}$$

since $\overline{U}NFC/2 = \overline{A}_T \times 2^9$

$$(\overline{A}_T \times 2^9) \cdot \overline{X}_{NB} > 1/2 \cos\theta_C$$

$$(A_T \times 2^9) \cos\theta > 1/2 \cos\theta_C$$

Now, $A_T \times 2^9$, instead of having a magnitude of 1/2, varies from .15 to .30, with the result that $\cos\theta$ must be larger than $\cos\theta_C$, or that θ must be smaller that θ_C. The attached figure shows the range of variation.

Rotation Control Release Angle vs Commanded Release Angle