THE CHARLES STARK DRAPER LABORATORY
A DIVISION OF MASSACHUSETTS INSTITUTE OF TECHNOLOGY
68 ALBANY STREET
CAMBRIDGE, MASSACHUSETTS 02139

TO: R. Larsen
FROM: Craig Work
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SUBJECT: Computational corrections built into PCR 1129 constants.

The 1-jet angular accelerations computed in the 1/ACCS section of LUMINARY for the Apollo 15 flight are nominally defined as:

$$1JACC_n = TNOM/INERT$$

where TNOM is the nominal torque about the axis being considered and INERT is the moment of inertia for the same axis. However, the deflected jet angular acceleration is defined by:

$$1JACC_d = T_d/INERT$$

where T_d is the torque of the deflected jet. The average value, $1JACC = T_{av}/INERT$ is used for both jets because they are almost always used in pairs, one deflected and one nominal, with $T_{av} = (TNOM + T_d)/2$

The use of this average value affects the computation of ACCDOT, the jerk term for the trim gimbal control. The nominal jerk term computation is:

$$ACCDOT = \frac{F\ L\ \dot{\delta}}{INERT}$$

where some of the PCR 1129 constants calculate L, the hinge-pin to c.g. distance for the trim gimbal, and INERT is defined above. Since the quantity INERT is not explicitly available, it is replaced by TNOM/1JACC in the 1/ACCS computations. The correct replacement would be $T_{av}/1JACC$ so the PCR 1129 constants generate L ($TNOM/T_{av}$) instead of the true value of L. As a result, ACCDOT is correctly computed as:

$$ACCDOT = \frac{F * L * TNOM * \dot{\delta} * 1JACC}{T_{av} \qquad TNOM}$$

cc: C. Work (3)
R. Larsen
D. Fraser
B. McCoy
P. Weissman