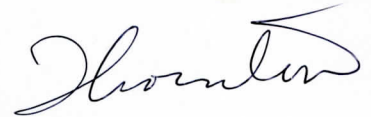


UNITED STATES GOVERNMENT

Memorandum



TO : Memorandum for Record

DATE: October 1, 1969

FROM : CB/A. W. England

SUBJECT: Comparison of A7L and omega suits in 1/6-g

Jack Slight (FCSD) organized a 1/6-g comparison of the ILC A7L and omega suits in the KC-135 on Sept. 29, 1969. The photographic records of the flight will show the new suit to have significantly improved mobility over the A7L.

To qualify these photo results, my observations as the test subject follow:

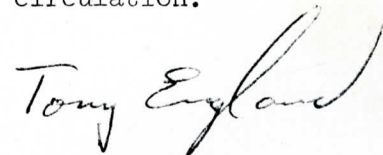
a. The fit of the two suits were nearly identical. The torso and legs were excellent, but the arms in both suits were about $1\frac{1}{2}$ inches too long. Hand manipulation was thus degraded, and I'm sure this shows in the film. A flight weight PLSS was used.

b. Bending at the waist and kneeling in the A7L suit were limited by suit freedom. In the omega suit, such movements were limited by displacement of the CG and not by suit freedom. This suggests that, given the new suit, a direction for improved lunar EVA mobility would be to lighten and/or redesign the PLSS to move the CG forward.

c. Air circulation in the new suit is reduced. The waist and neck convolutes are undoubtedly the restrictions. At the same flow rates, the humidity and the CO₂ levels were noticeably higher in the new suit. (At one point I noted signs of hypoxia.) All tests were run with the diverter valve in the IV position.

d. A chief advantage in the new suit is the ^{waist}convolute. It aids sitting, twisting sideways, bending at the waist both forward and to the side, and better ground surveillance while walking. I have mixed feelings about the neck convolute. Moving the helmet requires using either the hands to position it or considerable pressure of the face against its interior. In addition, the neck convolute makes donning the suit more difficult, and it restricts air circulation.

A. W. England



awe/cam

