

ORIG: L. C. DIRKS /saf
UNIT: SPS/DDS&T
EXT: 7905
DATE: 27 NOVEMBER 1964

Approved for Release: 2021/04/09 C05099658

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FULCRUM

ATTENTION: (MADDEN)

REFERENCE: MAIN CAMERA INTERFACE SPECIFICATION (9204-SHC64-191)

1: THE PROJECT OFFICE PLANS TO USE THE INTERFACE SPECIFICATION AS A BASIS FOR PREPARING AN UPDATED PRELIMINARY SPACECRAFT SPECIFICATION. THE MAIN CAMERA INTERFACE SPECIFICATION WILL BE AN ATTACHMENT TO THIS DOCUMENT, BUT THE PERFORMANCE SPECIFICATIONS TO BE MET BY THE SPACECRAFT CONTRACTOR WILL BE CONTAINED IN THE SPECIFICATION DOCUMENT PREPARED BY THIS OFFICE. WITH THIS PERSPECTIVE, IT IS IMPORTANT THAT THE INTERFACE SPECIFICATION PREPARED BY ACORN BE AS DETAILED AS POSSIBLE, WITH ALL CALCULATIONS BASED ON CURRENT BEST-ESTIMATE DATA. IN AREAS OF DIRECT CONCERN TO ACORN,

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THE SPACECRAFT SPEC. WILL BE COORDINATED WITH ACORN SO THAT MEANINGFUL SPACECRAFT PERFORMANCE MARGINS ARE ESTABLISHED WHERE NECESSARY. IT IS THEREFORE CRITICAL THAT THE FUNDAMENTAL ASSUMPTIONS FORMING THE BASIS OF THE PERFORMANCE REQUIREMENTS BE CLEARLY IDENTIFIED FROM THE OUTSET.

2. A REVIEW OF 9204-SHC64-191 HAS PRODUCED THE FOLLOWING

QUESTIONS:

(a) PARAGRAPH 2.2: WHAT IS THE BASIS FOR THE 1.5 TO 2.5 HOURS OPERATING TIME ESTIMATE? 30-60 MINUTES PER CAMERA SEEMS CLOSER.

(b) PARAGRAPH 2.3: HOW DOES THE 6 HOURS TOTAL OPERATING TIME BREAKDOWN?

(c) PARAGRAPH 3.2: PACKAGING TRADEOFF INFORMATION SHOULD BE INCLUDED. THE CASES OF INTEREST ARE: (1) MINIMUM

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LENGTH PACKAGING, (2) MINIMUM DIAMETER PACKAGING, (3) MINIMUM WINDOW SIZE PACKAGING.

(d) PARAGRAPH 4.1: IS 2200 LBS. THE CURRENT BEST WEIGHT ESTIMATE?

(e) PARAGRAPH 4.2: THE ACCURACY OF INITIAL CENTER OF GRAVITY LOCATION DETERMINATION AND C.G. TRAVEL DURING OPERATION ARE OF IMPORTANCE FOR PROPULSION SYSTEM DESIGN. PLOTS OF C.G. MOTION SHOULD BE INCLUDED WITH EMPHASIS ON THE EXTREME CASES, EVERY EFFORT SHOULD BE MADE TO MINIMIZE C.G. SHIFT.

(f) PARAGRAPH 4.3: ARE THESE NUMBERS INDEPENDENT OF FILM TRAVEL? ARE THE CROSS PRODUCTS OF INERTIA IN FACT ZERO? (CROSS PRODUCTS DETERMINE ATTITUDE CONTROL SYSTEM INTERAXIAL COUPLING AND DIRECTLY INFLUENCE SYSTEM DESIGN.)

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(g) PARAGRAPH 4.4: PROJECT OFFICE UNABLE TO RECONSTRUCT THESE NUMBERS. A PRELIMINARY CALCULATION GIVES MAXIMUM ANGULAR MOMENTUM PER CAMERA OF 165 SLUG FT. SQUARED PER SECOND (ONE SPOOL FULL, V/H OF 0.05 RAD. /SEC.) THIS RESULTS IN A YAW AXIS PROJECTION OF ABOUT 43 PER CAMERA. NO CONDITION COULD BE FOUND WHICH RESULTED IN THE RESIDUAL YAW MOMENTUM CHANGING SIGN. WITH SINGLE CAMERA OPERATION THE RESIDUAL ROLL AXIS MOMENTUM FOR THESE ASSUMPTIONS IS ABOUT 160 AND CAN BE EITHER PLUS OR MINUS. REQUIRED: DATA UNDERLYING CALCULATIONS ALONG WITH PLOTS OF CAMERA ANGULAR MOMENTUM VS. FILM STATUS WITH V/H AS A PARAMETER. ALSO, THE STARTUP AND SHUTDOWN TORQUE PROFILES ARE REQUIRED FOR ATTITUDE CONTROL SYSTEM DESIGN.

(h) PARAGRAPH 5.4: WHAT IS MEANT BY "PLUME COORDINATING OFFICERS

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INTERFERENCE"?

(i) PARAGRAPH 6.3: WHY IS 1900 WATTS FOR 60 SECONDS REQUIRED FOR SHUTDOWN IF 1900 WATTS FOR 20 SECONDS IS SUFFICIENT FOR STARTUP? WHAT ASSUMPTIONS LEAD TO 6000 WATT-HOURS TOTAL? (FYI CURRENT PROJECT OFFICE THINKING CALLS FOR THE CAPABILITY TO EXPEND ALL FILM IN SINGLE CAMERA OPERATION.)

(j) PARAGRAPH 7.0: DISCUSSED IN PREVIOUS COMMUNICATION.

(k) PARAGRAPH 8.0: TO WHAT EXTENT CAN INCREASED ATTITUDE ERROR BE TRADED AGAINST IMPROVED RATE STABILITY?

(l) PARAGRAPH 10: THE ASCENT TEMPERATURE REQUIREMENT DOES NOT APPEAR CONSISTENT WITH THE ON-ORBIT REQUIREMENT.

3. ACTION: PLEASE SUBMIT A REVISED AND EXPANDED COORDINATING OFFICERS

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INTERFACE SPEC. AS SOON AS PRACTICAL. AS PRELIMINARY INTERFACE MEETINGS WILL OCCUR EARLY IN DECEMBER, THE PROJECT OFFICE NEEDS THIS SPEC. BY NO LATER THAN 5 DECEMBER. PLEASE ADVISE IF FURTHER CONSULTATIONS ARE NECESSARY PRIOR TO THE 5TH.

END OF MESSAGE

[Handwritten Signature]
JOHN F. BLAKE
EXEC. OFFICER
RELEASING OFFICER

COORDINATING OFFICERS

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[Handwritten Signature]
LESLIE C. DIRKS
SPS/DDS&T
AUTHENTICATING OFFICER

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