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23 June 1964

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To: [redacted]

From: [redacted]

Subject: J-9 OPERATIONAL ANOMALIES

The preliminary evaluation of Mission 1006-1 and 1006-2 has disclosed some significant system anomalies which should receive immediate attention.

I MASTER CAMERA

1. The starboard (take-up) horizon camera imagery was very soft throughout the A mission. Some improvement was observed at the start of pass 36 however the quality was still inferior to the port camera. This condition was similar to the horizon camera image quality normally observed prior to the recent shutter change. It is possible that tightening the camera boot to solve the vignetting problem may have induced excessive loading on the camera shutter.

   The horizon camera quality remained constant from pass 36 to pass 103 when the center of format switch failure caused extreme smear in both the starboard and port camera image. It is assumed that the pressure platen lifted during exposure and that the camera shutter was tripped during film metering. Itek evaluation confirms that this can occur with a center of format switch that is stuck closed.

2. The center of format switch failed randomly after pass 103 resulting in loss of essentially all Stellar/Index camera operations, data block and horizon camera fiducials. The horizon camera shutters continued to operate normally which is presently unexplainable as they are also triggered by the center of format switch. Itek is further evaluating this problem.

3. The abnormal orbital parameters resulted in V/h errors of -10% to -15% in the A mission and -5% to +10% in the B mission based on inflight data. Spot checks indicate that the instrument was running up to 5% faster than determined from the inflight data. Complete cycle rate data is not presently available. No image smear was detected which is inconsistent with the theoretical calculations. A re-evaluation of these calculations is underway.

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II SLAVE CAMERA

1. The starboard (supply) horizon camera imagery was inferior to normal throughout the mission. The degradation was apparently caused by overexposure. It is recommended that the aperture of the starboard horizon cameras be reduced for missions that have the sun to the side of the system.

2. The center of format switch was inoperative from pass 1 frame 10 to pass 3 frame 18. The data block, horizon camera fiducials and horizon camera shutter did not operate. There were end of pass marks at the completion of pass 1 and 2 near the end of the last frame.

3. The slave camera ran about 1% slower than the master during the A mission and 1% faster during the B mission.

4. The slave camera main door did not eject until after the programmed photography in pass 2. It is surmized that the door became bound by the thermal condition of the skin and came loose after thermal stabilization. Steps are underway to eliminate this problem.

III STELLAR-INDEX CAMERA; A MISSION

1. The stellar shutter failed closed 36 times and failed open 37 times. These failures were random however no failures occurred until pass 23.

2. A peculiar double star image was observed in many frames throughout the mission. Two distinct stellar fields were imaged with a slight trace between. Since there was a single reseau pattern it is concluded that the shutter opened, partially closed and then re-opened. Microdensitometer traces indicate that the initial shutter opening lasted about 1.4 seconds, was partially open for .9 seconds and re-opened for 1.1 seconds. The image displacement, in the worst case, was 65 microns. This corresponds to an attitude rate of 70 degrees per hour which is occasionally observed. Itek is further evaluating this problem.

3. One stellar fiducial lamp bloomed to an extent that the reseau image was lost.

4. The index camera shutter double exposed one frame.

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IV STELLAR-INDEX CAMERA; B MISSION

1. No significant anomalies

V ATTITUDE CONTROL

1. The cursory examination of the stellar attitude data shows nominal pitch and roll errors and a yaw error bias of -1^{o}.

2. Preliminary examination and comparison of the index and main camera photography shows a bias of about -1^{o} which would result in an yaw attitude bias of about -2^{o}.

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Special Staff

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