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20 October 1961

MEMORANDUM FOR : Deputy Director (Plans)

THROUGH : Acting Chief, Development Projects Division SCVR.

SUBJECT : Camera Performance on CORONA Mission 9005

1. Performance of the C Triple Prime Camera #56, launched on 13 October, has been assessed as being definitely poorer than the performance of Cameras #53 and #54, which were below expectations, and is said to be no better than C Prime camera performance. Film emulsion SO-132 was used. The phenomenon encountered is a definite out-of-focus condition covering extensive areas of the format. There remain, however, small portions at the beginning and end of the format of expected high resolution.

2. Camera #56 had been adjusted to account for an out-of-focus condition caused by a flexing of the film under vacuum conditions. Since discovery of this phenomenon in Cameras #53 and #54, measurements had been made on Camera #52 which indicated that the film under vacuum conditions was flexing some .006 inches out of the focal plane. The adjustment on Camera #56 was to approximately .006 inches in high expectation that this would overcome earlier difficulties. Subsequent measurements on Camera #51 made only in the past few days indicated film travel of only .002 inches. This wide disparity in film travel is apparently confirmed by the performance of the adjusted Camera #56 and leads to the conclusion that each camera is indeed a sensitive, unique instrument and must be individually calibrated for dynamic optical performance under vacuum conditions.

3. The presence of this effect, I believe, is caused by factors such as the lack of a platen, extreme sensitivity of performance to film tension control and also to precise mechanical adjustment of moving parts. With cameras expected to produce resolutions in the 150/200 lines per millimeter category, we are undoubtedly entering into a regime where these mechanical tolerances require a degree of perfection much higher than lower quality cameras. It is the present ITEK theory that the lens scan arm is generating a wave in the film during the scan cycle. This wave causes the film to flex out of the focal plane during passage of the slit. They have four solutions in the works at the present time. The first three are increasingly difficult measures to provide a platen. The first of these is an elastic platen, the second a very carefully machined but still soft plastic platen, and the third would be an extremely precise metal platen.

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Each of these present various amounts of difficulty in either manufacture and installation or in the effect on friction and film tension control. The fourth measure is the installation of an out-rigger roller which is supposed to cause formation of the wave ahead of the slit in hope that the film would return to the focal plane at the instant of passage. It is not certain just what kind of wave form might be generated in the film by this last modification.

4. I intend to hold a review meeting with Lockheed and ITEK in the next week or ten days in order to become better informed on measures being taken to correct this deficient performance and to ascertain the prospects for success. It is mandatory that we focus attention on this aspect of the problem at the present time when we are forced to revert to the previous camera design and faster film emulsion. If present problems with the C Triple Prime are not resolved during this interval, we will be again in the position of trying to correct troubles during the best operational season of the year when maximum performance should be expected.

SIGNED
EUGENE P. KIEFER
SA/TA/DPD

EPK/[redacted]

Distribution:

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