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2 October 1964

To: [redacted]

From: [redacted]

Subject: J-16 Electrostatic Corona (Instruments 162 and 163)

Introduction

The corona marking susceptibility of the film metering rollers in instruments 162 and 163 of J-16 system has been determined. Test results and recommendations are presented for your consideration.

The film metering rollers in instrument #163 demonstrated flight acceptable corona marking performance, both at Itek in component testing and at Advanced Projects in the J-16 system altitude test. Minor start up corona marks were present at pressures ranging between 0.4 and 1.7 microns when tested by A/P. Metered film was completely corona free during A/P altitude testing at pressures above 1.7 microns. 0.4 microns was the lowest internal camera pressure attained at A/P. 0.04 microns was the lowest pressure tested at Itek, as reported by [redacted] Instrument #163 is recommended for flight without further testing.

Instrument #162 demonstrated acceptable corona marking performance at A/P at pressures ranging down to 0.4 microns, the lowest internal camera pressure attained at A/P.

The metering rollers in instrument #162, when tested by Itek, failed the standard corona test in the pressure range from 0.04 to 0.7 microns. Excessive intermittent corona marking was present in the film sample submitted by Itek. The so-called "bad" metering rollers in instrument 162 were originally supplied by Itek on special A/P request for PMU test use only and were to be replaced by Itek when a good set was available.

Since instrument #162 has successfully passed the A/P system corona test down to 0.4 microns internal pressure, the question has been raised, "Should we fly instrument #162 in its present configuration without further testing and depend on the PMU system to maintain camera pressure above 0.4 microns where corona marking does not occur?"

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To: [redacted]

2 October 1964
Page 2

The following conclusions are offered for your consideration.

It is estimated that J-16 will exhibit acceptable corona in flight for the first 5 days, with or without the benefit of the PMU system. Thereafter, it is estimated that the internal camera pressure will be in the corona marking zone for instrument #162 if the PMU system should fail. After day 5, if instrument #162 should corona mark to the same degree in flight as it did in the Itek altitude test, the electrostatic corona marking is expected to cause a 20% reduction in instrument 162 resolution. This condition assumes a PMU failure prior to day 5. Over-all scene contrast is expected to drop from 2/1 to 1.6/1 due to a fog level rise from 0.12 to 0.40 density as a result of corona fogging. Peak corona fog is expected to be 1.5 density. Fog levels are referenced to the intermediate process level.

It is concluded that instrument 162 may exhibit unacceptable corona performance after day 5 if the PMU system should fail.

In the event that the PMU system maintains pressure above 0.4 microns throughout the operational portions of the flight, acceptable corona performance is anticipated throughout the flight.

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APPROVED [redacted]

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