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23 November 1960

MEMORANDUM FOR : Deputy Director (Plans)

THROUGH : Acting Chief, Development Projects Division, DD/P SUD

SUBJECT : CORONA Meeting

1. An informal meeting was held at [redacted] on 18 November to review mission 9012 results and plans for mission 9013. BSD, LMSD, ITEK, Undersecretary Air Force, and Headquarters were represented.

2. The results of mission 9012 (Discoverer XVII) showed successful vehicle performance and capsule recovery, but payload failure due to a break during the first operation. Despite early confusion due to a minor ground instrumentation failure, it is now certain that all vehicle functions were successful. Capsule recovery occurred 30 miles north of the exact center of the expected 120 by 20 mile recovery area.

3. After ejection of the capsule, the Agena vehicle was returned to its normal cruise attitude and remained stable through a total of 79 orbits, or more than a four day operation.

4. Payload failure occurred during orbit No. 1 after about 30 cycles of camera operation. Prior to launch, 45 cycles were run off without any now known malfunction during post loading check and count down checks (2 days) on pad. Camera operation began about 40 seconds (14 cycles) prior to acquisition by the [redacted] station. Fifteen cycles later, the break occurred, nine cycles after break the camera stopped, probably due to jamming with film. The only unusual record prior to break is uneven drive motor voltage which showed up normal on pad checks. Analysis of camera functions localized the break most likely between output metering rollers and take-up spool.

5. Examination of film showed that the break took place prior to passage of the film to leader splice through the camera, i.e., while leader was still in the camera. Minor scratches were found on leader passed on last 3 cycles of second day pad check. Leader was found to be minor scratched, flange marked, edge nicked, pressure marked, diagonally scratched, edge milled, and heavily scratched, in that order, prior to break. This indicates mistracking, uneven and increasing tension.

6. The leader is 5 mil thick acetate material and film is 3 mil mylar. Leader has about only 75 per cent of mylar film tensile strength and half of mylar tear resistance. Leader has been used to prevent gluing of emulsion to rollers and emulsion deposit on rollers during launch acceleration and pre-launch "setting."

7. We were unable to cause mistracking on another camera by merely allowing slack between supply spool and input metering rollers. Continual mistracking took place only when supply metering rollers were forcibly pried apart, and film was deliberately misaligned. This mistracking would continue on one side only; the mistrack would correct itself when the misalignment was begun at the opposite side of the rollers. Both mylar film and leader were used in this test, and the leader would continue to mistrack only to the right and film only to the left. This shows the extreme sensitivity to film tension and skew roller adjustment.

8. Six C' cameras have been received so far by LMSD from ITEK. Five have been tested to varying extent. Two of these have been returned to ITEK for rework. Of the two others which were used, one required two MATS tests before acceptance and had seen brake and skew roller adjustment problems at VAFB and was lost without a chance to operate in shot No. XVI. The other, which did not perform successfully in no. XVII, had similar switch, brake, clutch, and other troubles prior to acceptance in MATS test. The last of these five is scheduled for No. XVIII, 5 December (more likely 6 December) and has had similar, but less extensive, troubles. It has had about 15,000 test cycles, however, and 20,000 to 25,000 cycles is a conservative life expectancy.

9. The camera used in No. XIV (completely successful) ran about 30,000 cycles total, but was refurbished after 22,000.

10. I think ITEK have still not perfected the film tension control in the basic mechanism, and that film breakage has been lessened due to the mylar film entirely.

11. After XVIII on 5 December (approximately), no CORONA firings are scheduled until 9 February.

12. The following steps have been, or are being, taken:

(a) LMSD will send a complete history and daily report on camera for XVIII.

(b) [redacted] will examine a C' camera and go over recent performance to advise on camera flight readiness for 5 December and to advise on desirable adjustments or fixes between now and February next.

(c) LMED will report on extent of refurbishment of the camera used in XIV as a point of comparison for flight readiness of XVIII.

(d) [redacted] has been notified of the generally poor record of C' cameras so far.

(e) A test will be made to determine if a leader must continue to be used with mylar film; if so, a mylar leader can be used in place of acetate.

SIGNED
EUGENE P. KIEFER
Chief, Technical Analysis Staff
NPD-ED/P

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