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Copy No. 1-X

TO: M. Burnett

FROM: H. Alpaugh/S. Herman

SUBJECT: Mission 1112-1 Performance

Mission 1112 utilized for the first time a glass (BK7) plate which had an evaporated coating that closely matches the W23A in the aft unit and the W25 in the forward unit. Each unit has a primary and alternate filter position and used an 0.037 inch thick filter for the primary position with an 0.040inhh for the alternate position. This permitted a shift in operation.

Prior to operation the peak resolution positions were determined with the primary .037 filter. By positioning the .040 filter in the optical path during operation one may in effect shift (+ or longer) by .001. This action was taken during pass D-16 and pass D-48.

Mobile Corns were deployed in a way that permitted imagery to be obtained with the primary and alternate filters during each operation. The atmospheric conditions were excellent during both operations. This permitted excellent opportunity to evaluate the Mobile Corns and surrounding imagery under nearly simultaneous conditions.

GROUP 1
Excluded from automatic downgrading and declassification

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Fig. 1 shows the curves of average ground test resolution for both units. Added to the curves are the estimated relative filter performance levels of the primary and alternate filters as determined by evaluation of in flight imagery.

The optical imagery was evaluated by three techniques with all three showing close agreement. These techniques were reading of the Mobile Five to one Corn by three readers, evaluation of the imagery as acquired on photography taken prior to the filter change and after the filter change, and third, the V.E.M. technique was utilized.

The results of these evaluations indicated that both units produced their best imagery with the primary filter. The forward unit image quality change was just detectable indicating that the optimum operational setting fell close to the mid-point of the two positions. The aft unit image quality change was more easily detected indicating that the optimum operational setting fell nearly identical to the pre-operational setting. The mission pre-operational peak was set for an approximate temperature of 60°F. This mission came very close to this condition. Fig. 1 also shows that peak resolution positions for both instruments was probably set as near optimum as current technology permits.

Steve Herman

SH/dh

cc: R. Burks

RELATIVE PERFORMANCE MISSION 1112-1

FIG-1

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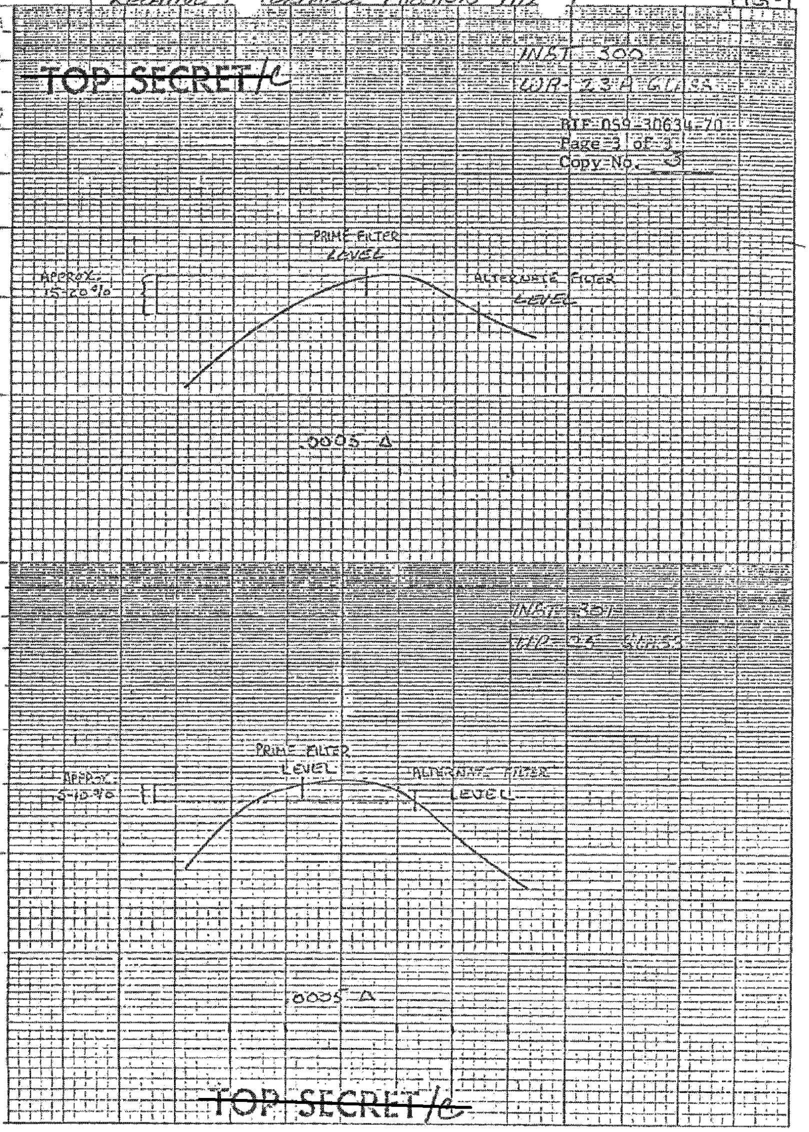

K&E SEMI-LOGARITHMIC 46 4970
2 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

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MEMORANDUM FOR: Director of Special Projects

SUBJECT : Photo Reconnaissance Systems Report No. 70

I. CORONA

A. Accomplishments

OR-2 (Mission 1112) "B" recovery was accomplished on 7 December 1970 at 2224Z (on board), Rev 309.

B. Problems

1. Mission 1112 material and data recovered from "A" and "B" is under analysis for cause of No. 2 instrument and DISIC failure.

2. CR-15 slope programmer failure analysis is continuing. Preliminary indications are that an incorrect solvent used in the cleaning of the bearings caused drying out of the lubricants in the vendor motor mod.

C. Projected Schedule

1. CR-13. Pre-storage.

2. CR-14. Storage, R-25 status.

3. CR-15. Pre-storage.

4. CR-16. Environmental preps.

5. CR-8. Instrument acceptance.

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SUBJECT: Photo Reconnaissance Systems Report No. 70

II. HEXAGON

A. General

1. The HEXAGON Exposure and Ephemeris Program is in final checkout by LMSC personnel assigned to the effort. Final modifications to this software for obtaining "TUNITY" slit-bias inputs (for snow) are intended to support the CPX planned for 15 through 18 December.

2. An Orbital Operations Policy Subgroup (OOPS) meeting was held on 9 December in which three policies were established: (a) redundant station contact sequences are permissible if PMU capacity remains after operational sequences are generated; (b) generation of SS operations will utilize an ephemeris no older than three previous revs; (c) use of SPC inhibit is restricted to those specified in the flight profile and those agreed to by the SPO.

3. An Operations Interface Work Group meeting was held on 10 December.

a. The TMWG reported that correctors are available for correction of the flight-limiting problem concerning processing of telemetry from the station disc. Telemetry processing modes are in good shape except for the modes processing SS dynamic data. The thermal/vacuum telemetry tape supplied by LMSC/PE to the FTFD for rehearsal purposes will not be used because Aerospace (without coordinating with PE and apparently, with LMSC) stated that the tape was not adequate.

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SUBJECT: Photo Reconnaissance Systems Report No. 70

b. LMSC has prepared an ICD covering the sharing of telemetry tapes. (Ed Smathers advised after the Operations IWG meeting that the SPO had not concurred with this procedure for the sharing of telemetry tapes.)

c. SSPO attempted to identify the data (computer listings, LMSC TR log, schedules, etc.) required by SSPO and PE for support of operations, but the SPO decided that this subject would be discussed between SPO and SSPO after the meeting.

4. A review of the updated Forward Assembly Kit (FAK) FACI data was conducted at PE on 9 December to expedite completion of the FACI of the Kit. Modification of the FAK CEI specification to include (or reference) additional specific acceptance tests and to incorporate the latest configuration baseline were the most significant actions on which agreement was reached. The coincidence of the configuration baseline, the as-built configuration, and the qualification configuration simplified the FACI review. Formal acknowledgment of the FACI completion is pending Headquarters receipt of the PE documentation, including the revised CEI specification.

5. The supply y- and x-axis vibration tests for the caging deletion study will commence 14 December and should be completed about 23 December. Quick-look data from the y-axis shake should give an early indication of how the caging deletion decision might go. The design margin vibration test will be conducted during the week of 4 January.

SUBJECT: Photo Reconnaissance Systems Report No. 70

B. Model Status

1. Development Model (SDV-III)

In-air photographic tests on SDV-III have been completed, and the system began vacuum photographic tests on 10 December. In-air data indicates a focal plane shift of as much as 24 microns may have occurred since the Danbury test. A full evaluation plan for the Chamber A-2 material is in preparation.

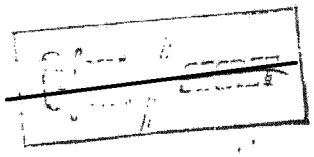
2. SV-1 (SN-003)

SV-1 mating operations were completed on 6 December. System level testing has been delayed due to problems arising in the aft section. The IRA TM system and command system have experienced failure during the past week. It appears now that it probably will be necessary to replace the IRA and the command programmer on SV-1 during the integrated test cycle. As of now, it appears that there will be a 3-day slip to completion of the SV-1 payload test (21 December vice 18 December).

3. SV-2 (SN-002)

a. Midsection

Two in-air chamber tests have been run this week. A third in-air test is being run today. The modified metering capstan servos, which should solve the resonance problem, are expected to be available for SN-002 prior to start of Chamber "A" acceptance testing. Chamber pumpdown is scheduled for 16 December.



SUBJECT: Photo Reconnaissance Systems Report No. 70

b. Forward Section

Electrical checkout of the forward section cables is now underway. Updating of procedures for future assembly and test operations is in process.

4. SV-3 (SN-004)

TCA vibration was completed on 10 December. Post-vibration inspection has been completed, and the system is now in the clean room undergoing post-vibration testing. The leak test was successfully passed.

Post-vibration testing is scheduled for completion on 18 December, and midsection installation for 22 December. Ready Room "A" tests will be run from 28 December until 12 February. Chamber "A" testing is scheduled for 10 March-25 March, and shipment 14 April, one day before its contractual delivery date.

III. Meetings Requiring Participation of Headquarters Personnel

Date	Subject	Attendees
PE		
15 Dec.	SN-002 Chamber "A" Readiness Review	
17 Dec.	Black Box Qualification Certification Meeting	

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SUBJECT: Photo Reconnaissance Systems Report No. 70

Date	Subject	Attendees
LMSC		
17 Dec.	Managers Meeting	Patterson
Warrenton Training Center		
15-17 Dec.	EK Configuration Change Board	Kohler
Army Map Service		
14 Dec.	TOPOCOM Briefing and Tour	[redacted] Kohler [redacted]

[redacted]
PMO/PRS/OSP

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Cy 8 - C/SB/OSP
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Cy 10 - RB/OSP
Cy 11 - PRS/File
Cy 12 - PRS/Chrono
Cy 13 - NEPO
Cy 14 - WCPO

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24 December 1970

MEMORANDUM FOR: Director of Special Projects

SUBJECT : Photo Reconnaissance Systems Report No. 72

I. CORONA

A. Accomplishments

CR-14 and CR-15 storage audits were completed.

B. Problems

1. A bent switch cluster actuator was discovered on CR-8 during instrument acceptance; further investigation indicated potential damage to other actuators in all systems. Bent actuators allow for over-travel of .0002" to .0003" in extreme cases. All systems are being inspected, and bent actuators replaced. In addition, a product improvement "FEWO" is being incorporated, adding redundancy to the switch function, on all remaining systems.

2. CR-16 had a bad cut-and-wrap during pre-storage functional. The system was reconfigured for tracking test to properly realign the system. During hand cycling operation, the payload had a loss of back torque which was subsequently attributed to the A-1 servo amplifier on the No. 1 side. The amplifier was replaced, and the camera acceptance was successfully completed. The system was then reloaded for tracking.

SUBJECT: Photo Reconnaissance Systems Report No. 72

C. Projected Schedule

1. CR-13. Flight preps.

2. CR-14. Storage, R-25 status.

3. CR-15. Pre-storage.

4. CR-16. Tracking.

5. CR-8. Instrument acceptance.

II. HEXAGON

A. General

1. The configuration check of the Uncaged Supply test specimen has been completed with successful results. PE is proceeding with the uncaged concept for P-7. A design margin vibration test will be conducted in mid-January.

2. The system thermal difficulties encountered in the Chamber A-1 test of SDV-III requires that the thermal aspects of the Chamber A-1 test of SV-1 be modified. A Structural/Mechanical/Thermal IFWG will be held on the west coast the week of 4 January to develop a joint recommendation for test mods.

3. The second orbital rehearsal was held starting 15 December and ending with Rev. 52 on 18 December. No major problems were identified in the rehearsal. The SPO directed that the third rehearsal, scheduled for 5-8 January, be lengthened by two days and conclude on 10 January. The rehearsal will be close to the "hominal profile" for first five days of first flight. As a result of a meeting between SSPO and SPO representatives at the WCPO on 23 December the following broad guidelines for the first mission were agreed upon:

SUBJECT: Photo Reconnaissance Systems Report No. 72

a. No negative operational adjusts.

b. Have perigee near injection point (about 20 degrees N).

c. 95 NM is min. altitude for mission. No altitude above 145 NM in sunlight area.

d. Min. rewind for first three RV's.

e. Minus 20 to plus 10 degrees beta angle. Launch at beginning of window.

f. Plan mission to fill four RV's in 30 days; however, plan the ephemeris for 45 days which would allow latitude to fill three RV's in 21-22 days and fill RV-4 by Day 45.

g. Plan for scan angles of plus or minus 30 degrees in general but accommodating the 45 degree scan angle requirements developed by B. Johnson of Headquarters and forwarded to the STC.

4. As a result of the rehearsal-2 activities, several changes will be made to the HEXAGON Exposure and Ephemeris (HEEP) software. Checkout and final testing should be completed in time for rehearsal No. 3 on 5 January. LMSC personnel have provided the necessary ephemeris data to OSP for support of rehearsal No. 3, and work is continuing on this ephemeris software.

B. Model Status

1. Development Model (SDV-III)

a. The loading of the new film stacks into the supply and the subsequent supply checkout were

completed during the evening of 23 December. The supply will be available to SVIC for installation into the vehicle after the holidays (0700 27 December).

b. The material put into RV's 2, 3, and 4 in the chambers has now all been removed. RV-1 (takeup DM-4) is scheduled for shipment to EK on 28 December.

2. SV-1 (SN-003)

The vertical baseline test was completed on 20 December with no anomalous behavior noted. The SCC (Sequencer) box was removed on 21 December during a LMSC-caused window to permit repair of the damaged connector pin. The box was reinstalled on 22 December and will be functionally tested during the horizontal baseline test, which is expected to begin on 28 December.

3. SV-2 (SN-002)

a. Forward Section

No A&T activity was conducted during this period. Considerable effort, however, has been expended on the revision and updating of SV-2-related test procedures.

b. Midsection

Optical Bar "A" has been replaced. Platen "A" was vibrated during the OB replacement and has been reinstalled. The redesigned supply (FEV) was installed. All of the rework was accomplished

without removing the Two Camera Assembly from the midsection. System testing is now underway. The supply steerer oscillation, previously present on Camera "B," appears to be gone.

4. SV-3 (SN-004)

The Two Camera Assembly and the supply have been installed in the midsection assembly and moved to Ready Room "A." Manufacturing and CC verification is scheduled to begin 28 December.

III. Meetings Requiring Participation of Headquarters Personnel

Date	Subject	Attendees
EK		
29 Dec	Work out Practice PFA Details	
RCA		
28 Dec	Buy Off P3-3	
HQ		
28-29 Dec	DH-7776 CCR Negotiations	

DONALD W. PATTERSON
D/PRS/OSP

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SUBJECT: Photo Reconnaissance Systems Report No. 72

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Copy 10 of 14
31 December 1970

MEMORANDUM FOR: Director of Special Projects

SUBJECT : Photo Reconnaissance Systems Report No. 73

I. CORONA

A. Accomplishments

1. The switch cluster actuator inspection and replacement is completed (CR-13).

2. Replacement TU's for CR-13 DISIC were received on 29 December 1970.

B. Problems

CR-16 cut and wrap problem is unsolved to date, but retracking is still in process with realigned SRV.

C. Projected Schedule

1. CR-13. Flight preps.

2. CR-14. Storage B/U R-25 status.

3. CR-15. Pre-storage.

4. CR-16. Retracking.

5. CR-8. Instrument acceptance.

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SUBJECT: Photo Reconnaissance Systems Report No. 73

II. HEXAGON

A. General

1. A review of the P3-3 take-up buy-off data and an inspection of the hardware resulted in a requirement for an additional vibration test. A crack was found in the beryllium shaft and a dental drill was used to machine it out. This resulted in a cut of 120 mils in a 200 mil wall. PE felt that all of the microcracks were eliminated, but the Project Office required a proof test. This unit is scheduled for SV-3. The impact of the additional testing is a two-week delay in the shipment and a resultant holdup in the McDonnell Douglas production line. However, there is no impact on the launch schedule.

2. As previously reported (Weekly Report No. 69), EK has determined that repeated windings of a film stack crush the pelloid backing on the film and increase the core pressure if the winding conditions are held constant. This effect reduces the confidence in the results of the vibration tests of the uncaged configuration since those film stacks had been rewound. (The single stack had been rewound eight times and the two stacks used in the "all-up" test had been rewound two and three times respectively.) This decrease in confidence is offset by the fact that the single stack survived a 60% overtest (4.0 g's vs. 2.5 g's qual level). Since positive data will not be available to evaluate these opposing factors prior to the need date to commit to a no-caging design (by not ordering parts for P-9), some risk will be assumed in proceeding with the no-cage design. This risk will be assumed since future negative data can be offset by deliberately respooling the flight film rolls. (EK normally does some rewinding as a matter of course to eliminate faulty film.)

SUBJECT: Photo Reconnaissance Systems Report No. 73

3. CCR negotiations were not completed on 29 December as intended. Details will be presented at the Monday Staff Meeting.

4. Discussions have been held with PE/WCFO regarding usage of additional software support personnel now being hired. The next major software task for PE/WCFO will be the preparation of auxiliary support software for HOPE (HEXAGON Operations Performance Evaluation) message (REBOUND-830).

B. Model Status

1. Development Model (SDV-III)

Both the original supply covers have been removed and the Mass Model covers installed, thereby making two flight quality covers available for SV-1. The supply was reinstalled into the system 28 December. The RV-1 was shipped to EK for support of the practice PFA scheduled for January 1971. The TU from RV-2 (DM-3) has been removed for installation into the Take-up Simulator (TUS). There is presently no plan to repair the "A" side prior to shipping the system to VAFB for pad validation tests. The pyros are presently being installed in the RV's.

2. SV-1 (SN-003)

No significant PE activity. Work on the system during this period has been primarily LMSC trouble-shooting of Attitude Reference Module, TM Multiplexer, Extended Command System, and [redacted] The vehicle is scheduled to be moved to the horizontal position on 31 December.

SUBJECT: Photo Reconnaissance Systems Report No. 73

3. SV-2 (SN-002)

Chamber "A" in-air tests were run this week. The data shows that the "A" side metering capstan error increased by a factor of three since the last midsection level test. Between the two tests, platen A was vibrated to acceptance levels. The platen is being removed and will be replaced. Some format illuminator tests will have to be repeated and will start approximately 6 January.

IV. Meetings Requiring Particlpation of Headquarters Personnel

Date	Subject	Attendees
PE		
5 Jan	Review Spares Data Packages	
EK		
6 Jan	Core Pressure Meeting	
6 Jan	Practice PFA Pre-Meeting	
7-8 Jan	Practice PFA	Burks, Kohler,
8 Jan	Review DM-4 Despooling	

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SUBJECT: Photo Reconnaissance Systems Report No. 73

Date	Subject	Attendees
NPIC		
5-6 Jan	CORONA PET Meeting	[redacted] (5th only) Burks, Kohler
LMSC		
6-8 Jan	Thermal Subgroup Meeting Structural/Mechanical IFWG	[redacted]

[redacted]
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