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27 March 1970

MEMORANDUM FOR: Director of Special Projects

SUBJECT : Photo Reconnaissance Systems Report No. 33

I. CORONA

A. Accomplishments

1. Mission 1109 (CR-10) was successfully terminated on 23 March 1970 during Rev 309. The second bucket has been forwarded to EK for processing. No anomalies were noted during the entire mission.

2. Proposals for the fabrication of replacement units for Haydon Timers have been received and evaluated. Contract award to Autronics, Los Angeles, is presently pending.

B. Problems

During HIVOS preps, CR-13's disic testing indicated a defective T/U. The unit will be replaced, and the HIVOS test will be delayed approximately one week.

C. Projected Status

1. CR-11. Storage.

2. CR-12. Pre-storage tests.

3. CR-13. Environmental tests.

4. QR-2. Tracking.

5. CR-14. System assembly.

6. CR-15. Modifications.

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II. HEXAGON

A. General

1. The Monthly Technical Meeting was held at SSC on 25 March 1970. Highlights of the meeting were:

a) The problems of film tracking at the 30° scan mode for both the "D" and P-1 models was reviewed. No consistent explanation was presented; however, system alignment/film tracking problems, coupled with the servo system "jitter" during the long pause at 30°, was referred to several times. A "tranquilizer" box, which deactivates the film drive and metering capstans during the pause, was built and tested on the "D" model. The test was inconclusive as a flaw in the box kept the capstans turned off all the time. As the problem has not been resolved, the plan is to conduct all testing on the West Coast in the 60° or greater scan mode. This increases the test film usage and requires that the supply be changed before any testing on the West Coast. This, in turn, will prevent any testing of the ATCS (Active Thermal Control System) in Chamber "A-1" since the ATCS was sized for the thermal gradient compatible with 40% film and not 50%.

b) Chamber "A" photographic data from the "D" model was presented for the 70° temperature conditions. Bar "B" was presented as having 161 l/mm for the 50% case and 130 l/mm for the 96% low case.

c) The results of the P-1 acceptance vibration testing was presented. The worst results (on the platen) were presented only when the Project Office specifically requested that they be shown. When asked what alternative plans they

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were considering to fill the gaps in testing on some of the small components (the platen and looper were undertested on the component level) P.E. top management took the position that none was required. This is a high risk approach with elements which have such stringent alignment and functional requirements as the platen and looper.

d) The presentation on the SSTC maintenance program consisted of generalities on fault isolation and circuit card replacement and repair. The SSTC's are supposed to isolate faults down to the circuit card level by means of its self test feature. After fault isolation, the problem will be fixed by either replacing or repairing the faulty item. Performance will then be reverified again by means of the self test circuit.

SSTC's No. 2 through 5 will have spare cards, but SSTC No. 1 will only have spare piece parts (resistors, etc.) because it is not common to the other four. Spare cards for No. 1 would be uneconomical.

P.E. failed to bring out that there will probably be no testing of the spare cards at the vendor's facility, but this is not alarming since the vendor's (AC Electronics) QC program seems satisfactory. P.E. said at the 9 March Spares Meeting that the cards could be tested if SSTC No. 5 was available at AC, but AC would have to be tasked to do this, and Headquarters does not feel that this is the way to go.

e) The report on the automatic microdensitometer was unsatisfactory. It seems that the device, which is supposed to measure the plane of best focus and OB-to-film sync, is plagued with mechanical and software problems. Their solutions to the problems are in three categories: 1) noise reduction activity for the electronics; 2) correction of the software programs; 3) fabrication of optical standard targets to be used for calibration. There was no schedule information presented and no plan as to how to solve the problems.

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2. The West Coast IBM computer 360/65 was ready for program checkouts at 1700 on 23 March 1970.

3. The forward section build-up could have started on 25 March 1970, as far as SSPO items were concerned. The SPO had been requested to make the forward section available as soon as possible, and there are indications that it will be made available about 1 April 1970.

4. Regarding the SO-236 film and the 819 chemistry situation, the Project Office feels that the best approach is to devote one versamat to P.E. to this evaluation effort. Arrangements are being made to have the necessary supplies sent to P.E.

5. Responses were received from all CORONA and HEXAGON Contractors on the FY 1971 Program and FY 1972 Budget Call. The submissions were in line with budgeted funds requested in previous years with the exception of Perkin-Elmer, who came in with a considerable increase in both the FY 1971 Program and Estimated Program Budget Costs for years beyond 1971. The FY 1971 submission is approximately $18 million above the figure submitted in last year's NRO Program Call. The average cost of sensor subsystems for the follow-on procurement of six units showed an increase of about $4 million per unit. The Project Office is making a separate assessment of the validity of these costs and will modify the Contractor's funding request if appropriate.

6. P.E. received proposals on the production and refurbishment of take-ups from RCA and General Electric. The General Electric cost for the manufacture of eight take-ups and the refurbishment of 16 was $13.9 million, while RCA submitted a quote for $5.1 million. P.E.'s estimate, based on an incomplete costing, was $6.5 million. P.E. requested permission to commence fact-finding with RCA to determine what additions to their cost proposal might be incurred due to changes. RCA proposal was based on a December 1969 design.

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3. A discussion was held with Messrs. [redacted] and Patterson regarding the method of contracting for follow-on procurement. The principal problem at the present time is the lack of authorized funds from the NRO to cover the entire obligations that P.E. would normally make under fixed price contracting in FY 1970. Because of the long lead time in the procurement of many items, most subcontracts must be initiated prior to the end of this fiscal year. P.E. is investigating issuing contracts on the basis of limitation of liability on the subcontracts to $6.1 million which has been requested from the NRO for long lead time purchases in FY 1970. Approximately $4 million of the $6 million has already been approved and the $2 million is being held pending further requests by the Project Office for these funds. If suitable contract arrangements can be worked out, it is expected that P.E. will place the subcontractors immediately under a fixed price contract. If they cannot be so arranged, it may be necessary to issue separate contracts for FY 1970 long lead procurement and for follow-on production or to issue letter contracts to cover long lead procurement only.

8. SSC has agreed to participate in the development and updating of the Headquarters Test Requirements/Test Compliance Matrix. The updating information will be provided regularly at each of the schedule reviews beginning 1 April. There are different views concerning the interpretation of "requirements"; however, these are not expected to interpose insurmountable problems.

9. SSC is in the process of compiling all of the contractually required data for the conduct of the "Preliminary FACI" and the "Acceptance" of the D Model. The documentation will include acceptance and technical certification data, AVE test logs, fabrication and inspection records, MRB's, ECO's, qual test reports, reconciliatory reports (D and P-1 Models), CEI and equipment specifications, and test data.

10. One side on both the Development Model and Flight Model has a cyclic error on the metering capstan summed error signal. On the D Model the error repeats about once every 18 frames, for a duration of about 4 or 5 frames. The envelope appears to be sinusoidal. The error signal increases (over spec) about a factor of

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four at the envelope maximum. The problem has existed for "a couple of months". P.E. has assigned a team to investigate the problem, but cannot yet explain the source of the error. The flight model modification repeats about every 50 frames with an over spec ratio or two to one.

B. Development Model

The Development Model has completed the 40° and 100°F photo vacuum tests with Camera A. The plan is to trouble-shoot Camera "B" in front of the chamber and, if it can be fixed within 24 hours, to go back in for a 100°F stereo qual test. This would lead to a ship date of 10 April for the D Model. If there is a major failure such as the OB motor or encoder, the schedule and test plan will have to be reassessed.

C. Flight Model #1

1. The supply is complete and is being installed in the mid-section. There are two or three items on the supply which will have to be field retrofitted according to the present plans.

2. The midsection is complete except for cables used to gain access to thermocouples in Chambers A and A-1. The thermocouples monitor the performance of the active thermal control system. SSC is unable at this time to manufacture these cables and will attempt to install AGE cables to perform this function during chamber tests.

3. The TCA is to be installed into the midsection on 30 March. The better part of the last week has been used up investigating 30° scan problems. The special 30° scan tests have been completed on P-1 without providing an explanation for the problem or resulting in a satisfactory correction for one side of this model. At the present time, one side of the model does not operate satisfactorily at 30°.

4. SSC is now quoting a 31 May 1970 ship date for P-1 with no slack or contingency in the test program.

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D. Flight Model #2

Both OB's have been put into the frame and are going into alignment. Platen "A" goes into the assembly on 27 March. Platen "B" has suffered more 2A4 (photo mode electronics) box problems. The first problem was a blown capacitor which was caused by the platen test station, where AC and DC power were simultaneously applied to the box. This problem has been fixed. The cause and nature of the second problem is due to the way the box is mounted -- the wires rub against the casing and short out, and the mounting is now being changed. Two PE Aerospace boxes and one RadInc box are being fixed as a result of this problem. Another 2A4 box is available and will be put in the assembly next week. Platen "B" encoder failed acceptance vibration test. The switching tracks did not respond properly after vibration. The P-3 encoder is now being used in P-2, and the P-2 problem is being investigated. P-2 is currently about four days late to a 7 April completion of the two-camera-assembly.

III. Meetings Requiring Participation of Headquarters Personnel

Date	Subject	Attendees
WESTOVER AFB		
31 March - 1 April	HEXAGON Data Review	Burke, [redacted] Kohler.
HEADQUARTERS		
1 Apr	Schedule Review	Staff

Personnel

[redacted] reported for duty at the West Coast Project Office on 20 March 1970, and is assigned to the Computer Software Support position.

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Training

[redacted] **will attend the Budget Process Course at Headquarters from 30 March through 3 April.**

[redacted]
PMO/PRS/OSP

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Cy 14 - [redacted]

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