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26 March 1965

MEMORANDUM FOR: Chief of Projects

SUBJECT: Weekly Status Report No. 27 on Project FULCRUM

1. Camera System

A. ITEK - Messrs. Cohen, Batchelder, Galat, Gibson, Redpath, and six brassboard technicians visited P. E. on 23 March to discuss the Itek camera design and the operation of the brassboard.

The last trailer load of FULCRUM material was transferred from Itek to P. E. on 23 March and consisted of the full-scale layout board and the last pieces of optical glass. All TM's and all final reports with the exception of the Ion Physics Summary Report and the Final Summary Report have been received as of 25 March. Specifically, reports received this week include:

- (1) Engineering notes on the brassboard.
- (2) Results of feasibility environmental testing of optics.
- (3) Updated engineering notes on the optical fabrication and mounting feasibility effort.
- (4) Alternate configuration studies (TM 236) -- the results of a study of the advantages and disadvantages of the various panoramic camera configurations considered.
- (5) Subsystem acceptance tests specifications (TM-247).
- (6) Interpretation of brassboard test results (TM-246).

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- (7) Brassboard operation handbook (engineering notes).
- (8) System dynamics analysis report, "Vehicle disturbing torques arising from camera operation" (TM-228).
- (9) Probability study, "Analysis of random contributions to blur" (TM-245).

B. P.E. - Dr. Wheelon and Messrs.  Maxey, Crowley, McMahon, and Dirks attended a briefing at P.E. on 22 March. Aside from apparent internal P.E. conflict regarding the Itek FULCRUM design, the following points were brought out in the briefing:

- (1) FULCRUM can be built as is and will take photographs.
- (2) The P.E. Project personnel are willing to build FULCRUM as is.
- (3) P.E. does not recommend building FULCRUM as it now is.
- (4) Starting from where we are now, we believe a better system is available within an acceptable time span (undefined).
- (5) P.E.'s technical evaluation during this study period considered in detail the following problem areas:
  - a. "Intermittent" rotating bars.
  - b. The perforated folding mirror.
  - c. The quoted performance prediction.
  - d. The power consumption.
  - e. The weight status.
  - f. The complex assembly configuration.

and indicated their concern in these areas.

- (6) P.E.'s "building blocks" and possible system modification included:
  - a. Leveling the scan axis.
  - b. Oscillating the platen
  - c. Taking the supply spool off the optical bar.
  - d. Oscillating the optical bar.
  - e. Going to an F/4 system.

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**(7) P. E. made the following programmatic observations:**

- a. There appears to be a discrepancy in the number of optical shop personnel required.
- b. SI camera had not been included in P. E. 's cost and manpower estimate.
- c. There was some discrepancy in the types and quantities of deliverable models and camera systems.
- d. The basis for Itek's facility costs of twice that estimated by P. E. must be reconciled.

**(8) A chart, showing shipment of the first camera unit 20 months after firm system specification definition on 26 April, was presented.**

**(9) Five recommendations were listed in summary, but these seemed to have little meaning with regard to the selection of a camera configuration in a meaningful time period.**

Mr. Dirks returned to P. E. on 24 March to further assist P. E. in understanding the Itek camera design and to ascertain the extent of associate contractors' assistance required. Messrs. Reeves, Shoop, and Brindley of SEAC joined Mr. Dirks on 25 March at P. E. to discuss the film transport problem.

P. E. twixed in on 24 March the results of some preliminary tests they had conducted with film being transported in vacuum at speeds up to 260 inches per second and pressure between 50 and 200 microns with the following observations:

- (1) "It is concluded that no significant exposure must necessarily occur as a result of transporting film at representative speeds and pressures for the FULCRUM system."
- (2) "It is recommended that no further effort be expended at this time to evaluate static electricity in the operating system, since it may not be a problem."

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A cost estimate and work statement for March and April was twixed in on 24 March, the total cost of \$306,000 representing an increase of \$186,000 over that authorized for March and April. (part of which will be offset by a \$55,000 surplus from previous contracts.) The work statement consisted essentially of a continuation of the FULCRUM camera system analysis, the introduction of new "P. E. building blocks", and the layout of the facility and program plans.

C. RCA - RCA submitted a revised cost and schedule, reflecting the redirection of their effort by the Project Office. The feasibility program is now estimated to be a six-months effort at a total cost of \$352,160, of which approximately \$18,000 is for material.

**2. Spacecraft**

Mr. [ ] of the Project Office & Mr. Reese of G. E. visited Dr. Chalmers at STL on 22 March to ascertain the status and developmental costs of the STL programmer. Messrs. Hood, Bryant, and Buford visited Mr. Besserer at STL on 24 March to discuss briefly the SEAC approach to test, assembly, and layout.

**3. Recovery System**

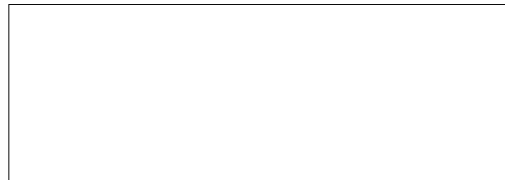
Work is continuing on an attempted reduction in overall re-entry vehicle diameter to 62 inches vice the current referenced diameter of 66 inches.

**4. Systems Engineering**

STL twixed in on 26 March an estimated cost of \$186,600 to cover a slightly increased SEAC level of effort for the month of April.

**5. Interface Aspects**

No interface meetings were held during this week.



O/DDS&T/SPS [ ]/mes/5725 (14 April 65)

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