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12 March 1965

MEMORANDUM FOR: Chief of Projects

SUBJECT: Weekly Status Report No. 25 on Project  
FULCRUM1. Camera System

A. ITEK - Work is continuing on crating hardware for shipment, collecting documents, and preparing reports. Mr. McDonald visited Itek on 10 March and negotiated the closing costs of the FULCRUM contract such that \$3,797,000 would not be exceeded for the total contract. All equipment that Itek bid on with the exception of the equipment installed at Ion Physics was turned down and will be shipped to P. E. Mr. McDonald was also informed that 29 people would be released on 19 March, 7 on 26 March, and the last 8 on 31 March, the result being the early release of more people. The Final Report of Task 4 was received in the form of TM-227. This included the updating of the facilities specifications and associated equipment design and specifications through 2 March. In addition, The Final Report on the System Performance Analysis under Task 5 was received and consisted essentially of the final corrected data from TM-172.

B. P. E. - Mr. Rosenau visited STL on 10 March and discussed with Mr. Besserer the general SEAC area and with Mr. Reeves the film handling effort accomplished by Mr. Reeves's group. Messrs. Forsyth, Landsman, Cowles, and McCammond visited Itek on 9 March to inspect the brassboard and other hardware that was to be shipped to P. E. and took back with them the 1/4 scale

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camera system model. Messrs. [ ] visited Itok on 11 March and picked up the full scale cut-away of the single camera.

C. STL - The Final Report covering the February additional tasks to the Film Transport Study was received on 9 March. Under the Analysis Task the results of the additional analog simulation indicated that the continuous system could be made to exhibit smooth well-damped response by incorporating sufficient damping at two idler rollers adjacent to the capstan drive and that appreciable reduction in damping lead to highly oscillatory response to programmed velocity changes. Under the digital computer modal analysis subtask, it was found that the addition of viscous dampers to the dancer translational linkage results in a significant increase in system modal damping, thus confirming the results of the analog simulation. The slack box experiments were of two types. The first was to determine the magnitude of the disturbance torque imparted to the film transport assembly during high speed removal of film from the slack box. The "accordion" configuration had the advantage that approximately 50% more film could be placed within the slack box than with the other configurations. The measurement of disturbance torque for nearly instantaneous film starting was only partially successful due to motor peak torque limitation and the need for exact control of roller pressure as the film was clutched-in. A number of pertinent conclusions were drawn from a study of film looping within various geometrical configurations of the storage box. Preliminary interface specifications were prepared for the intermittent and continuous film transports (the Reeves's film transport design).

D. RCA - [ ] visited RCA on 11 March with Messrs. Parker, Isom, and Kenville and discussed in general the cost and schedule effect resulting from the revised work statement and some security problems associated with the brassboard fabrication, assembly, and tests.

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Mr. Frisch visited Headquarters on 12 March and delivered the reports called for under the February contract. In the Attitude Control Subsystem Status Report, it was pointed out that the major emphasis during this period was to analytically determine the feasibility of a single-gyro attitude control subsystem configuration, to further analyze and evaluate the ATL horizon scanner performance configuration, and to define the attitude control and stabilization design concept. Copies of "Specification for a Liquid Bipropellant Rocket Engine System" were received, this specification for the drag make-up engine procurement constituting the complete qualification requirements for the subsystem. It is intended by G. E. to submit these specifications to the Marquardt Corporation, Bell Aerosystems, and possibly Rocketdyne for RFP purposes at the beginning of Phase II. Three copies of a report entitled, "Command Subsystem Analysis", were also received, the primary purpose of which was to present the necessary information required to compare the G. E. and G. E. /STL programmers. [redacted] is currently using this document in his evaluation.

[redacted] visited G. E. on 11 March and discussed with Messrs. Petty, Frisch, and Ginsberg the methodology used by G. E. in programmatic scheduling and cost control.

**3. Recovery System**

Action has been undertaken to establish a communications facility at Avco, and until such time as this can be implemented, the communications facilities at SEI have been requested to handle Avco's traffic, thus bypassing Itak.

**4. Systems Engineering**

STL is preparing a briefing to be presented next week on the systems engineering concepts to be employed during Phase II.

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**5. Interface Aspects**

Dr. Garwin completed the writing of the Technical Evaluation Report on 6 March for approval by Dr. Land. A copy of this report was given to Mr. McCone that same day.



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