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DEPARTMENT OF THE AIR FORCE
MANNED ORBITING LABORATORY, SYSTEMS OFFICE (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045



SAFSL-1

24 September 1968

~~MEMORANDUM FOR GEN STEWART~~

SUBJECT: MOL Monthly Management Report

Attached is the MOL Monthly Management Report for the
period 25 July - 25 August 1968.

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Report

J. S. Blymaier
J. S. BLYMAIER
Major General, USAF
Deputy Director, MOL

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MOL Systems Office Monthly Progress Report
25 July - 25 Aug 1968

I. PROGRAM MANAGEMENT

1. Interface Program

Significant progress in definitizing technical interfaces and attaining intercontractor agreement was achieved during August 1968. At the sixth Technical Signoff Meeting (TSOM) conducted at GE during the week of 19 August, 85 LV to MM interfaces were signed off. We have concentrated on defining key interfaces, the resolution of which is a prerequisite to our forthcoming contract definitization activities.

The TSOM has proven effective in assembling the right people, stimulating mutual understanding and motivating resolution of difficult interface problems. Over 500 interface agreements have been signed off during the last six months of TSOM activity.

2. "Upgrade" Activity

Much effort has been expended this past month in evaluating contractors' assessment of the cost impact of the new SP/DR & SAFSL Exhibits. Their initial assessment reflected extensively inflated interpretations of technical requirements and lack of recognition of existing contractual requirements. Extensive review, screening, clarification and reworking of SP/DR and SAFSL requirements, definition of deviations where appropriate, and correction of contractor interpretations where necessary resulted in a 75% reduction of the cost impact. Our twofold objective is to assure an accurate, complete and mutual understanding of the program's technical requirements with each associate contractor before we enter into formal contract negotiations in December and hold fast to those requirements that guarantee the technical integrity of the program.

The Systems Office (SO) has also been extensively engaged in reviewing and approving the contractors' translation of SP/DR - SAFSL requirements into CEI specifications and SOW's, and assuring that SOW's are integrated, compatible and consistent with contractor roles and responsibilities that were defined and documented in July. Roles and responsibilities have been delineated in three major areas:

- (1) All activity at Vandenberg AFB from activation of facilities to launch
- (2) Integrated in-plant testing
- (3) Integrated technical performance analysis

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All contractors' CDRL's and Form 9's have been updated to reflect the current baseline data requirements. These requirements were carefully reviewed to preclude duplications and to retain only those requirements that are clearly essential.

3. Procurement Planning

The unpriced S/A to be issued on 16 October by the SO is intended to include the following; however, some exceptions may be made in order to smooth out the work effort:

- (a) Previously authorized (but unnegotiated) changes to the basic contract;
- (b) The FY 69 schedule adjustment;
- (c) All technical requirement changes resulting from SP/DR and SAFSL exhibit upgrading;
- (d) Previously deferred work, i.e., VAFB tasks;
- (e) Newly defined integration roles and responsibilities;
- (f) All items of work common to both the manned/automatic and the automatic (unmanned) configuration, i.e., work, analyses, documentation, etc., that is presently authorized as part of the basic contracts to preserve the automatic (unmanned) capability for flights 6 and 7;
- (g) As an option, all peculiar tasks, hardware and software required to launch flights 6 and 7 as manned/automatic missions (identical to flights 3, 4 and 5).

4. Contract Negotiation Status

a. United Technology Center: Supplemental Agreement No. 8 is being issued to the UTC-1022 contract to definitize the Letter Contract portion for a Target Price of \$114,000,000.00. Price Negotiation Memos are being prepared and submittal to the SAMSO Procurement Committee for initial review is expected in two weeks.

b. AC Electronics Division of General Motors Corporation: The Contractor has responded to our message requesting that stretch-out negotiations begin immediately. The Contractor states that he is not in a position at this time to proceed with said negotiations because of the current uncertainties relative to the performance, price and delivery of Mission Guidance Computers from the Univac Division of Sperry Rand Corporation. An understanding will be reached with ACED to determine a reasonable time to begin negotiations.

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c. Flights 6 and 7

(1) Douglas factfindings on Phase I proposal was completed 19 August. The remaining Douglas Phase I negotiation schedule is:

26 August - DAC submits revised proposal.

5 September - SO pre-negotiation meeting.

9 September - Begin negotiation.

(2) The GE Phase I negotiation Schedule will be finalized when the Douglas negotiation is completed.

(3) The EK Phase I negotiation schedule is tentatively set as:

1 October - Contractor submits proposal.

10 November - AF Evaluation complete.

15 November - Begin negotiation.

5. Advanced Planning Activities

a. Systems Office advanced planning personnel sponsored briefings by representatives of GE on some of the work they have been doing under other contracts or with their own funds. GE requested permission to make the presentations because they believed the work would be of interest for our advanced planning activities. Subjects covered were: (1) a GE-developed computer program for performing mission analysis of proposed systems; (2) GE work to date on the problem of performing [redacted] and (3) the GE approach for using IR sensors from space.

b. The Systems Office sponsored a meeting at MDAC-West on the NASA/AVCO Corporation study effort on integration of the Brayton Cycle electrical power conversion system into an advanced MDL mission concept. Study effort is almost complete with results indicating a potential savings of over 30,000 lbs of expendables by using this system rather than fuel cells for a one-year mission. Final report is due during September.

6. Search and Rescue Agreement

The agreement between the Air Force of Chile and the USAF concerning a joint program for the conduct of search and rescue operations from Easter Island in support of Manned Space Flights was consummated on 26 July 1968. The agreement will remain in force for a period of five (5) years and thereafter until one year after either party gives to the other party notice of its desire to discontinue the joint operations.

Note: Chile has not yet officially transmitted the signed document to the US

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7.

The statement of changes and ROM for the CCN protecting the option to incorporate [REDACTED] software was received 1 Aug 1968. Proposed was a \$125K six month effort which would include a requirements definition study and revisions to the Part I Specification establishing a new design requirements baseline.

8. Joint NASA/DOD Space Program

The Systems Office has prepared a briefing on a joint NASA/DOD Space Program that would be launched from the Western Test Range. This briefing would serve as the Program Office input to Mr. Nevin Palley, of the DDR&E, and to Mr. Luskin, of the Apollo Applications Program, on the DOD interest in providing MOL hardware to NASA for a 30, 60 and 90 day mission.

9. Test Wing Training

A number of meetings were held with personnel from the Aerospace Test Wing and the local Air Training Command office to determine Test Wing training requirements. It appears that, through use of the data acquired for the Powered Flight Controllers and from other T-II and T-III programs, the ATC can provide a considerable degree of Test Wing training. It is intended that any additional needs will be traded off against the individual associate contractors' in-factory training capabilities and Test Wing participation.

10. Transfer of Damaged MM Structure

The damaged Mission Module Forward Section was returned to DAC from GE on 30 July 1968. The structure was transported from GE to Willow Grove Naval Air Station and loaded on the [REDACTED] aircraft in accordance with the new GE Transportation Plan. This plan was reviewed in detail by the Systems Office and the AFFRO at a meeting held at GE on 26 July. The plan provides adequate safeguards to preclude recurrence of a similar accident.

11. Construction Program Status

a. The facilities at SLC-6 listed below were accepted by the Air Force:

- (1) Launch Control Center
- (2) Electrical Tunnel
- (3) Master Substation
- (4) Segment Receipt and Storage Building
- (5) Ready Building

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b. As of 25 August, Package 2 of SLC-6 was 67.5% complete and packages 3 and 4 were 93.0% complete. Package 1 of the MOL Support Facilities is 12% complete. The design of Package 2, MSF, was completed and delivered to the Systems Office at the beginning of the reporting period.

c. On 13 and 14 August 1968, this office participated in a review on SLC-6 construction status and future funding requirements. The review was held at HQ AFSC and HQ USAF. The results of the meeting were: (1) that the Corps of Engineers were to be authorized the remaining funds; this will bring the total cost of construction up to the ceiling of \$27.6M; (2) that the Corps of Engineers would insure that the contractor completed the present contract by 1 April 1969; (3) that Gen Reilly would discuss with his staff the problem of future funding requirements and possible methods of funding that effort required prior to release of FY 70 MCP funds.

12. Cost Planning and Control Activities

a. DAC. Two meetings were held during the week between DAC, SL-12 and SL-4 personnel to review the progress and the corrective actions taken in response to the Evaluation/Demonstration report. Current plans are to complete these actions within 90 days.

b. GE. As a result of the re-scheduling effort and implementing the Standard Cost Reports Package, GE has requested that demonstration be deferred until January 1969. The Systems Office has concurred with this request.

13. Program Schedule

a. No major program problems exist. Contractors are completing their detailed internal replanning to the FY 69 baseline. A Schedule Interface Log (SIL) Meeting was held at Valley Forge the week of 12 August and at Vandenberg AFB the week of 19 August to resolve outstanding interfaces. Contractor submissions for the PERT/Time run of 15 Sep 1969 will be compatible with the FY 69 baseline.

b. Major August Milestones completed are as follows:

1. 19 Aug - MDAC-ED - Completed the Electronic System Test Unit (ESTU) pyrotechnic radiation susceptibility test. The test examined the susceptibility of pyrotechnic devices during normal operations.

2. 19 Aug - MDAC-WD - Shipped the Mission Module Aft Bay Test Adapter to GE. This is a short section of the Mission Module Aft Section which will be mated with a Mission Module Forward Section and used by GE in their dynamic test program.

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II. TECHNICAL STATUS

1. Hycon Optical Equipment

A trip was made to Beale AFB by SO personnel to collect operational experience data on Hycon optical equipment used in the SR-71 program, especially the [REDACTED] performance. Findings indicated an overall equipment performance reliability (based upon actual operational experience) in excess of 98%.

2. Zero G Design Development Testing

On 29 July the Systems Office was briefed on a proposed use of neutral buoyancy for Zero G design development testing. RFP's will be solicited from both DAC and GE for assuming the responsibility of "host" contractor for these tests. Appropriate CAR's are being prepared. An ATP of 13 August has been established for release of the RFP's with responses required in 40 days. The contractors are being advised that all costs associated with the proposed testing must be included in the fund allocations for FY 69 and FY 70 previously furnished to the associates.

3. Increased LV Computer Memory

A CAR to increase the Laboratory Vehicle computer memory by 8,000 words has been boarded.

4. Survival Radio

On 19 August, the SO inspected the Cubic Corporation facilities for making the NASA Apollo survival radio. The Systems Office is considering using this radio in the MOL survival kit. Mr. Bill Blair, Program Manager, explained the testing set-up and proposed delivery schedule. Gemini peculiar modifications were also discussed.

5. Helicopter/Boilerplate Tests

During the period of 17-21 Aug 1968, HH53 helicopter/Gemini boilerplate pick up tests were conducted in the vicinities of Patrick AFB, Florida. The prime objective of the test was to investigate the stability of the HH53/Gemini B spacecraft combination in various aerial towing configurations. The standard helicopter cargo hook was used between the helicopter and the suspension system. The suspension system consisted of the attaching ring to the helicopter hook, a swivel unit, five wraps of 10,000 lb test nylon web strap, and a standard spacecraft retrieval hook. The Gemini B boilerplate was weighted and ballasted to approximate the same center of gravity and dynamic characteristics of the actual Gemini spacecraft. Boilerplate pick up at the small end with a trailing ribbed parachute attached to the hoist loop proved to be the most stable and safe method. The HH53 helicopter with the boilerplate in tow flew several refueling maneuvers with an HC-130P aircraft. Normal refueling procedures were employed, but no fuel was actually transferred. The tests were photographically documented.

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6. Orbital Flight Support Software

The initial review of the MOL Orbital Flight Support Software System Specification was held on 26 Aug 1968. The next review is scheduled for 10 Sep 1968, with the approval of Part I of the specification anticipated by 15 Oct 1968. This specification is essential to defining in detail the SO's requirements for support by the AF Satellite Control Facility.

7. Simulation Baseline

All simulation compliance specifications were signed officially by GE and SO personnel on 15 Aug 1968. The simulation technical baseline is now complete except for two open "to be determined (TED)" areas. The completion of this milestone represents the first fully redefined and approved portion of the GE Program.

8. Ground Alignment

GE has been requested to look at some new technical approaches to Ground Alignment as suggested by Aerospace Corporation and to rely more heavily on the flight alignment equipment. This was a direct result of the decisions made at the 15-19 July Program Manager's Meeting which reduced some of the requirements and lead times for MM Ground Alignment at VAFB and at other contractors' facilities. The main point emphasized by the Systems Office was that if the flight alignment equipment must be relied on in earth orbit, it should also be made sufficiently reliable to use on the ground for alignment verification.

9. GE-AVE CEI Review

The SO is currently participating in a GE-AVE CEI review being held at GE's Los Angeles facility. The review, which will end on 6 Sep, will result in an approved GE-AVE CEI specification; however, the Image Velocity Sensor (IVS) will remain an open area. Further study is being conducted to determine what approach will be used to solve the cloud sensing problem.

10. 70MM Cine Photography

In December 1968, GE abandoned their effort to use 70 mm cine photography for primary visual optics simulation display because of excessive jitter in the projector. In January 1968, the SO salvaged the 70 mm product, which was obtained by aerial photography techniques, and had ACIC reformat it to 35 mm to meet some targeting requirements of SAFSP. Three of these reformatted target runs showed no jitter when projected on a vertical screen. Furthermore, these film strips appeared to be more nearly identical to scenes viewed from orbit than any other stimulus material now being used. A large number of individual target passes showing approach, fly-by and departure scene sequences, both nadir and oblique, are being spliced into a continuous roll by ACIC for further demonstrations and SO analysis.

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11. Tracking Mirror Blank

The 71" diameter x 10" thick machined CER-VIT tracking mirror blank was delivered to EKC from Owens-Illinois and is undergoing inspection.

12. Heart Beat Interval Analysis And Display

Extensive effort has been directed at solidifying requirements and implementing techniques and procedures for the analysis and display of Heart Beat Interval (HBI) data telemetered from the OV. The requirements are included, as appropriate, in recent revisions of the ORD and Lab Module Computer Program (LMCP) CEI Part I Specification.

All HBI data will be recorded for intramission and postflight analysis. HBI will be converted to rate for display purposes. During station pass, raw HBI data will be continuously available at MCC, displayed in real time as rate. HBI data displays will permit rapid assessment of crew cardiovascular status and correlation of HBI data with crew activity and/or environmental parameters, system data, and previous HBI data.

13. Biomedical Use of the Onboard Computer

At IBM's request, Systems Office representatives met with Mr. Harrington and other IBM personnel on 21 Aug 68 to discuss the feasibility of onboard processing of biomedical data. IBM's specific interest was in determining whether existing data compression techniques could be applied on orbit to HBI and EKG information, thus reducing requirements on the PCM downlink bit stream. Since all HBI data is required at MCC and since EKG is required only in a contingency, it was decided that onboard data compression would be neither feasible nor desirable. It is of interest to note that specific biomedical data occupies only 10% of the bit stream in MOL as compared to 50% in NASA Gemini.

14. Zero G Testing, MOL Feeding System

Zero G flights have been planned from 16-20 Sep 68 at Wright-Patterson AFB, Ohio. Present plans call for testing the concept of eating food with a fork and spoon from an open package. A package has been designed with a new valve and closure method which will allow the package to be opened for eating and still meet the other requirements of the system.

15. AF Scientific Advisory Board

Systems Office personnel attended (as observers) a meeting of the AF Scientific Advisory Board dosimetric calculations task force on 7 Aug 68. The task force initiated an approach to codifying known radiation dose information into an operationally useful format.

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