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



29 APR 1968

SAFSL-4

MEMORANDUM FOR GENERAL STEWART

SUBJECT: MOL Monthly Management Report, 25 Feb - 25 Mar 1968

Attached is the monthly report of significant events, 25 February -
25 March 1968.

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Report

J. S. Byemaier
J. S. BYEMAIER, Maj Gen, USAF
Deputy Director, MOL

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MONTHLY REPORT
OF SIGNIFICANT EVENTS

25 FEBRUARY - 25 MARCH 1968

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1. Project Upgrade Progress:

a. The final coordinated SP/DR is scheduled to be transmitted to the contractors on 1 April. The entire SP/DR task, to this point, has been black. A white version will be prepared and distributed by 10 April along with a "disposition" document which shows traceability of old contractual SP/DR requirements to the new SP/DR or other requirements documents.

b. An unclassified documentation tree is in the final stages of preparation. A DORIAN version will be prepared by replacing the appropriate pages in the unclassified document tree with DORIAN pages. The first edition of the DORIAN documentation tree should be available for review by 10 April.

c. There are 197 interface specifications identified on the MOL Program. Procedures initiated at an 8 Jan 1968 Configuration Management meeting established the basic policies and procedures for the Interface Technical Signoff Meeting (TSOM). To date, 104 of the basic 197 interface specifications have been technically signed by the participating contractors and the MOL SPO. Schedules have been generated which identify TSOM's for all interfaces yet to be worked.

d. The revised draft of the SPP is in final stages of approval by the Deputy Program Director. Submittal to the Program Director for approval is planned for 15 April.

2. Effective 15 Mar 1968, the functions and personnel of the Gemini B Division of the Systems Office were transferred to the Laboratory Vehicle Directorate. Gemini B will retain its identity as a discrete system segment, although its procurement functions will be combined into the present Laboratory Vehicle Procurement Division. This move will consolidate, under a single engineering management office, all activities associated with the McDonnell Astronautics, and the Douglas Missile and Space Systems Divisions of the McDonnell Douglas Corporation.

3. Mr. Lloyd Wilson, ODDR&E, visited Douglas MSSD, Huntington Beach, California on 7 March. He was given a comprehensive presentation on Douglas responsibilities in the MOL Program, with emphasis on Douglas management and cost control activities. Mr. Wilson expressed considerable interest in the MOL Interface Program, in particular, and in engineering integration activities in general.

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4. Col Karstens and Maj Wilson participated in a MOL Aerospace Medical Division (AMD) bioastronautics exchange briefing for Maj Gen Humphries, Hq NASA, and the NASA Scientific and Technical Advisory Committee (STAC) on 15 Mar 1968. AMD personnel presented detailed reports on the research and testing being accomplished either in direct support of the MOL or in support of manned space flight generally. Very favorable comments were made by members of the STAC regarding the timeliness and quality of the work, and regarding the enthusiasms amongst the rank and file of AMD professional personnel for this area of R&D.

5. At a meeting with the associate contractor program managers on 26 March the following topics were discussed:

a. Contractors' questions and proposed changes to the Systems Office's 28 Feb publication of MOL Program Objectives and Constraints. (Based on this discussion, changes are being made to the 28 Feb document).

b. Latest results of shielded Kapton wire testing. The importance of adequate circuit breaker protection of shielded circuits was emphasized and the continued use of Kapton wire in the MOL system was confirmed.

c. Program planning for Flights 6 and 7 leading to a completion of Phase 1B and 1C by Dec 1968.

d. Impact of contractor recommended changes to the Test Operations Review Board's recommendations. A meeting is scheduled for 9 April to finalize implementation decisions regarding the Board's recommendations.

6. Flights 6 and 7:

a. Flights 6 and 7 integrated criteria which comprises configuration, test flow, roles and responsibilities, schedules, ground rules and program objectives has been updated. This updated criteria has been levied on General Electric as a SAFSL Exhibit to a CCN effective 20 March 1968. Douglas and Eastman Kodak have the updated criteria as a guide on their respective CCN's which are presently in force. Procurement cover letters to the updated criteria were sent to all three contractors on 15 March 1968 establishing the intent and schedule for a contract definition phase 1B/1C.

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b. Eastman Kodak will brief and work with Douglas, General Electric, Aerospace and the Air Force on 27 and 28 March 1968. This session will develop present status of their design, test, schedules, as well as plans for changes that are pending. The main objectives of this meeting are to begin to assure compatibility of system engineering segments such as requirements analysis, design, test, schedules, program plans, in addition to identifying interfaces. This meeting will be the first of a series of working groups which will integrate all segments into a team effort.

7. On 14 March 1968, IBM, the Douglas subcontractor for the spaceborne data computation subsystem, delivered a comprehensive presentation on the IBM Reliability Program associated with MOL hardware. Some questions had been raised as to the reliability predictions which IBM had computed relative to the IBM computer. The presentation adequately explained IBM's reliability prediction procedures and did confirm that these procedures were technically sound.

8. The Laboratory Module, Partial Forward Structure Substitute, (CEI 207261.A) was due to be shipped to McDonnell Astronautics on 28 Mar 68. Recent requirements have been received from McDonnell which necessitate a change to this structure. These new requirements incorporate a separation spring load reaction, where previously separation of the Gemini B from the Laboratory was accomplished by separation rockets. Basically, this change provides reaction pads for the springs in appropriate areas and will cause a skin thickness change on the forward panels of the Laboratory Unpressurized Section. The structure will remain at, and be reworked by Douglas. Douglas has reviewed the new requirements and is proceeding on a schedule which will allow them to ship this substitute on 3 June 68. That date is compatible with McDonnell Astronautics' requirements.

9. The corrector/diagonal mirror support structure (RINGO) assembly for Structural Development Model (SDM) #2 was completed 8 Mar 1968. This piece supports the folding mirrors and is mounted on the front of the Camera Optics Assembly (COA) structure.

10. The first test on SDM #1 has been completed. It consisted of a weight and center of gravity test on the COA structure.

11. A Modal Survey test was started on the SDM #1, COA structure. The structure is hard mounted to a rigid test fixture with three flight mounts and then vibrated to determine its dynamic characteristics.

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12. The "RINGO" structure for the Engineering Model (EM) was received 15 Mar 1968 at EKC.
13. The EKC Thermal Model (THM) design was released to manufacturing on 18 Mar 1968.
14. The sliding mask sizing study has been completed by GE and a two-position servo drive can be designed which requires less weight and power. EKC will determine if a two-position mask can be tolerated from a thermal control and resolution standpoint.
15. A Preliminary Design Review (PDR) on the Acquisition Subsystem was held on 6-8 March 1968 at GE. Previously, the Systems Office team attended the contractor-held PDR's for the Visual Display Projector (VDP) and Optic Assembly. The minutes and action items of these reviews were included in the overall PDR. The contractor provided excellent technical support and back-up material. The overall results of the PDR were very good. However, there are several action items concerning weight, orbit alignment, and power that are to be resolved prior to final sign-off.
16. GE Contractual Action Requests 012 and 021 were approved on 20 March 68. These CARs provide for GE to refurbish consoles 2 and 8, which were used to support the Vehicle 115 qualification tests, for use on Flight Vehicle 120 for Flight 5. The estimated cost reduction as a result of this action is \$720K.
17. An incremental Critical Design Review was held on the Mission Module Transporter (CEI #MOL 104A) at York, Pa., on 1 March 1968. Systems Office representatives felt that the design is satisfactorily fulfilling Part 1 CEI Specification Requirements.
18. A design Review was held at Aerojet General Corporation for the TIIM booster system on 5-6 March 1968. All four of the major Associate Contractors participated in the review. No great surprises came out of this review, however, a review of this magnitude is a good management tool for getting everyone on the program on the same frequency with respect to the technical content and on the same schedule.
19. The MOL Systems Office and Aerospace have reached agreement on the general configuration of the Payload vehicle for Flight #1. It will be an upper stage that closely resembles the shape and length of the OV but will be designed and fabricated by Martin Co. This will eliminate interface and support with/by other contractors. A Request for Proposal and a Statement of Work are being drafted to assure maximum side benefits in the POGO and flight dynamics area.

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20. A survey of the usability of surplus NASA Gemini AVE residuals at seven major McDonnell subcontractors has been conducted. Approximately seven million dollars worth of AVE had been set aside as being potentially usable to satisfy Gemini B spares requirements. As a result of this survey, it has been determined that all electronic type equipment is unsatisfactory for flight use. The more rigorous Gemini B screening on piece parts, and the inability to ascertain whether disapproved electronic piece parts were used in the building of electronic subassemblies, cause all electronic components to be suspect. Mechanical type assemblies were determined to be usable and a screening process has been agreed to with MAC which will insure maximum utilization of the residual hardware in the spare hardware deferred procurement.

21. A series of extra vehicular crew transfer Zero G development tests commenced at Wright-Patterson AFB during the week of 18 March 1968. The mockups used were developed by the McDonnell Astronautics Division. Prior to shipping the mockups from McDonnell, the Systems Office conducted a review of hardware and procedures with an emphasis on crew safety features. The March flights were the first of a series to evaluate various possible modes of body orientations while transferring, to test the hatch external opening and closing device, to work out Data Return Container handling procedures, to reveal procedural transfer problems, and to give the crewmen practice ingress/egress from the Gemini B. Pressure Suits and technicians to support the transfer simulations were provided by the Pressure Suit Assembly Project Office. These development tests are expected to take approximately one year with flights occurring every two months.

22. The AF Western Test Range has been requested to take appropriate action to keep the Instrumentation Ship Displays for ascent information on board the Apollo ships until 1 July. At that time, the inhouse data-link reliability studies now in progress will be completed. The results of the studies will determine whether or not MOL will employ these displays during powered flight.

23. Capt Johnson, Staff Meteorologist, attended a 27 Feb meeting of the Joint Density Working Group, consisting of representatives of SANSO, Air Weather Service, Cambridge Research Laboratories, Aerospace Defense Command and supporting contractors. Dr. Price, Aerospace Satellite Navigation Department, briefed on the May 1967 Local Gravity Accelerometer Experiment (LOGAX) orbital density measurements. LOGAX density values show extremely poor agreement at 81 NM with several prevalent model atmospheres. A comparison with corresponding density data obtained from the orbital decay of the Agena spacecraft indicates serious discrepancies. LOGAX density data varied greatly in response to the extreme solar and geomagnetic activity prevalent during the last two days of the LOGAX flight.

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24. A Statement of Work for TRW's Ascent and Reentry Mission Control Center Software effort beyond 30 Jun 1968 has been drafted and is being circulated for comments. The TRW Software effort will continue until the last manned flight according to present plans.

25. USAF School of Aerospace Medicine has just completed a 30 day test of the first delivered prototype of the MOL Feeding System. This was done in 5 psi oxygen using four men. Detailed results will be forthcoming after further data analysis. There was a distinct improvement in the essential characteristics of the food items and all MOL developmental milestones were met.

26. The Pressure Suit Assembly Project Office demonstrated the MOL prototype pressure suit to NASA, MSC Crew Systems Division personnel and discussed the MOL and Apollo pressure suit programs. Tentative arrangements have been made for surveying NASA surplus suit equipment for the purpose of transferring needed equipment to the Air Force. Surplus equipment includes some A-5-H pressure suits which will be useful for neutral buoyancy simulations and use by the associate contractors. The prototype MOL pressure suit was also demonstrated at the NASA/STAC briefing session at Brooks AFB on 15 March.

27. Construction at SLC-6, Vandenberg AFB, was marked by the erection of structural steel to the top level of the Umbilical Tower. In addition, a Beneficial Occupancy Date inspection of Missile Assembly Building-5 was completed on the 25th of March. The alterations to the original facility were accepted. The addition to the facility for U.T.C., however, was not accepted due to construction deficiencies.

28. The first integrated summary PERT on the January 1968 Baseline was cycled on 3 March 1968. A detailed PERT submittal is scheduled for 31 March 1968.

29. A Hardware Exchange Meeting was held 19-20 March 1968 at Douglas. A detail cleanup was achieved to bring the Hardware Exchange List (HEL) into alignment with the unpriced supplemental agreements. It was evident that as a result of the recent detail program planning reviews, such as the Test Operations Review Board and the Integrated Testing, the contractors' visibility as to what hardware they require has improved. There was an increase of approximately 10% in new proposed HEL items and a decrease of approximately 9% in previously identified HEL items. Program hard point schedules remained unchanged.

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30. Dr. Fred Shulman, Headquarters NASA, was briefed by the Advanced Plans office on follow-on program power requirements. Dr. Shulman's office is responsible for the development of NASA's Brayton Cycle power conversion system. A letter is being prepared to be sent from your office requesting NASA to consider possible MOL power requirements while developing this system.

31. The MOL CCB processed 67 ECPs; 30 were approved; 3 were disapproved and 34 were deferred for further evaluation. The major cost bearing ECPs approved by CCB action totalled approximately \$83,000 based upon nonnegotiated contractor estimates.

32. The TIIIM CCB processed 71 ECPs; 23 were approved; 6 were disapproved and 42 were deferred for further evaluation. The major cost bearing ECPs approved by CCB action totalled approximately \$31,667,000 based upon nonnegotiated contractor estimates. Two ECPs account for the majority of this cost. They are: MMC C05834, TIIIM Schedule Change, \$27,780,000 and AGC 60053, Stage 1 Turbine Rotor Redesign Program, \$2,280,000.

33. The financial statement for this reporting period is as follows:

Of the 430.0 million FY 68 funds released to the Systems Office, 423.6 million has been initiated.

34. MOL Manpower Status:

	AUTHORIZED	ASSIGNED
*OFFICERS	136	157
AIRMEN	9	8
CIVILIANS	102	95
HIGHGRADES	(34)	(30)
CLERICAL	(68)	(65)
	<u>247</u>	<u>260</u>

*MOL Flight Crew included. Six attached officers (4 Navy/Marine Flight Crew, 1 SAC and 1 MAC are not included).

T-IIIM military not shown.

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