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



14 NOV 1968

SAFSL-1

MEMORANDUM FOR GEN STEWART

SUBJECT: MOL Monthly Management Report

Attached is the MOL Monthly Management Report for the period
26 September - 25 October 1968.

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Report

J. S. Blizmaier
J. S. BLIZMAIER
Major General, USAF
Deputy Director, MOL

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MOL Monthly Progress Report
26 September - 25 October 1968

I. Program Management

1. Upgrade Activity - Personnel of the Systems Office, Aerospace Corporation and the associate contractors have devoted considerable effort toward insuring clear and accurate documentation leading to successful negotiation of the unpriced Supplemental Agreements. The Schedule Interface Log (SIL) has been revised and updated to reflect the total hardware exchange posture with current MOL Program baseline dates. The majority of the Contractor Data Requirements Lists (CDRL) have been completed and are undergoing final review by the Systems Office. The interactions of the CDRL's and the Government Furnished Data Lists (GFDL) are being worked to assure compatibility of the procurement package. The actual preparation of the unpriced Supplemental Agreements has progressed throughout the month as the required documentation became available to Procurement personnel. The McDonnell Douglas-Eastern Division and General Electric packages will be delivered to Hq AFSC (Deputy Chief of Staff, Procurement and Production) on 4 November 1968 for review and approval prior to release to the contractors. Preparation of the contractual material for the other associates is progressing satisfactorily.

2. Technical Signoff Meeting #7 - Interface Technical Signoff Meeting (TSOM) No. 7 in the Laboratory to Mission Module interface area was held at McDonnell Douglas-Western Division throughout the week of 14 October. One hundred fifty-six separate interface agreements were signed by the contractors and 139 of these were approved by the MOL Systems Office. The meeting has been evaluated as highly successful by all participants. The Configuration Control Board (CCB) met concurrently with the TSOM at Huntington Beach to formally approve all no-cost, no-impact documentation immediately after Technical Sign off. A final total of 58 proposals from MDAC-WD and 63 proposals from GE were approved at the TSOM for contractual implementation. All of the signed-off interfaces are being included in the S/A's to provide a more complete technical baseline.

3. Flights 6 and 7 - Negotiations to definitize the Phase I effort for the Support Module have been completed with McDonnell Douglas Corporation-Western Division. A CCN was issued to direct the contractor to complete the necessary Phase I effort. The end product of this effort will be a Phase II proposal that fully defines Support Module requirements, including required changes to existing equipment. The period of performance for this total Phase I effort extended from 1 September 1967 through 1 April 1969. The total price negotiated for the MDAC Phase I effort was \$3,205,000.

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The schedules and test flow for the Support Module are being revised to insure compatibility with FY 69 funding limitations.

4. Program Review Council - The MOL Program Review Council convened at Los Angeles on 24 October 1968. A complete briefing on present Program Status and several special briefings concerning specific technical aspects of the program were presented to the council. One of the special briefings concerned the relative merits of the low coefficient of expansion materials for use in the tracking mirrors. The recommendation was made to use ULE for the tracking mirror material and the council concurred in this recommendation. ULE will also be used for the primary mirrors on Flights 5, 6 and 7. Present planning is to use fused silica for primary mirrors on Flights 3 and 4, with the introduction of ULE for these mirrors if the development schedule permits earlier introduction.

5. Cost Planning and Control - On 1 and 2 October, the Air Force Demonstration/Validation team reviewed the progress made by McDonnell Douglas - Western Division in correcting the nine discrepancies cited in the CPCS Demonstration/Validation Report. The team reported that MDAC-WD has demonstrated good progress on five of the deficiencies and that they were encouraged to complete their corrective actions as soon as possible. Copies of the team visit report have been forwarded to MDAC-WD with the requirement that periodic progress reports be furnished to the Systems Office. Redemonstration is tentatively scheduled for March 1969.

6. Program Reviews - Three Program Reviews were conducted with associate contractors during this reporting period:

a. Titan IIIM Program Review was held on 14 and 15 October in conjunction with an overall Titan III review. The meeting with the major associate contractors that contribute to the launch vehicle effort was successful. No major problems were identified.

b. A review of the Pressure Suit Assembly was held on 23 October at the MOL Systems Office. Hamilton Standard's performance was critically reviewed in accordance with the pre-established agenda. The review resulted in significant clarification of Hamilton Standard's overall MOL Program understanding and their overall responsibilities to the program. Consequently, their participation in such interface efforts as the two-gas launch atmosphere testing and delivery of hardware items impacting MOL milestones is expected to proceed in a satisfactory manner toward fulfillment of all requirements. Three action items identified at the meeting have subsequently been closed out.

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c. Gemini B personnel of the Systems Office conducted a Technical Review at McDonnell Douglas-Eastern Division on 23 through 25 October. Various action items were identified and responsibilities for resolution were assigned. There were no anomalies of major significance noted during the review.

7. Briefing to USAF Surgeon General - Lt Gen Kenneth E. Pletcher, USAF Surgeon General, M/Gen Charles H. Roadman, Commander AMD and B/Gen Jack Bollerud, DCS Bioastronautics and Medicine, AFSC received a briefing on the MOL Life Support Subsystems and Operational Bioastronautics aspects of the MOL Program by members of the Directorate of Bioastronautics Staff, Col Stanley White, MOL Program Office and Col John Ord, Hq AMD on 28 October 1968. Included in the briefing was a tour of the McDonnell Douglas-Western Division facilities at Huntington Beach, California on 29 October 1968.

8. MOL Participation in Apollo 7 - MOL Systems Office personnel provided direct support and monitored selected operational activities during the recent Apollo 7 mission. Members of the MOL flight crew and other MOL operations personnel observed simulations of various mission phases and the launch at Cape Kennedy. In addition, several days of flight operations were observed at Mission Control Center in Houston. Bioastronautics support provided to the Apollo 7 mission included active support at Kennedy Space Center during pre-launch, launch, and recovery; and staff support at the Mission Control Center for medical operations. MOL Bioastronautics support to the NASA will continue throughout the Apollo program for the mutual benefit of both programs. Systems Office participation on an observation basis is continuing through the debriefing phase of Apollo 7. This participation enables our representatives to have personal contact with the NASA Systems Engineering Staff and the Apollo crewmen and provides ready access to mission reports.

9. Vandenberg AFB Construction Status - The Systems Office has been notified that \$1,145,000 of the \$2,600,000 requested to fund the incorporation of deferred modifications at Space Launch Complex-6 will be made available no earlier than November 1968 and no later than March 1969. This timing will permit incorporation of critical modifications prior to the AGE installation and checkout. Guidance concerning the remainder of the requested sum is anticipated from the Director of Civil Engineering, Air Force, at a later date.

On 25 October 1968 construction of Package 2 of the launch complex facilities was 73.5% complete. This package includes the major pad components and its completion is paced by the anticipated 1 April 1969 completion date

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for the Mobile Service Tower. Packages 3 and 4 were 97% complete on the same date. The power plant is the major uncompleted item in these packages and it is expected to be completed by 15 November 1968. Package 1 of the MOL Support Facilities at VAFB is approximately 22% complete. Drawings and specifications for Package 2 of these facilities have been transmitted to the Corps of Engineers for processing and overall completion of this package is scheduled for 1 October 1969.

10. Funds and Manpower Status - Of the \$294.5M FY 69 funds released to the Systems Office, \$288.8M has been initiated.

Systems Office manpower status is as follows:

	<u>Authorized*</u>	<u>Assigned*</u>
Officers	184	157
Airmen	12	10
Civilians	106	94
High Grades	(33)	(31)
Clerical	(73)	(63)
TOTAL	<u>302</u>	<u>261</u>

*Includes Houston Field Office

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II. Technical Status

1. Meteorite Testing of MOL Pressure Suit Material - The NASA Manned Spacecraft Center has agreed to conduct meteorite testing of MOL pressure suit material lay ups at no cost starting about 1 November 1968. The estimated cost of this testing was \$30K.
2. Abort and Guidance Switchover Indicators - The Systems Office has reviewed the feasible methods of implementing the System Performance/Design Requirements (SP/DR) requirements for ground commanded illumination of the Abort and Guidance Switchover indicators in the Gemini B. The three methods reviewed were: (1) use of the command receivers in the Laboratory Module; (2) use of the command receivers on the TIIIM; and (3) installation of a command receiver on the Gemini B. Use of the TIIIM command receivers was selected as the best alternative from both a technical and a cost effectiveness standpoint.
3. Feeding System - The MOL food item list has been enlarged to include six hi-caloric soups, some new deserts and new bites. Bites of rehydratable beef, lamb, chicken and turkey will be investigated during the next quarter. Beef bites have already been produced and are of very high quality. This will be a significant contribution to the food list since it will be the first time natural meats will be available for space feeding systems.
4. Medical Contingencies - The Systems Office has initiated a study to reevaluate and revalidate concepts and plans for management of medical contingencies in prolonged manned spaceflight. This study, which was prompted by the colds suffered by the Apollo 7 astronauts, will consider prevention, treatment, and operational procedures relative to the management of all potential medical contingencies.
5. Launch Pad Hazardous Vapor Detection System (HVDS) - Representatives of the Systems Office participated in a preliminary design review of the Launch Pad HVDS at Martin-Marietta Corporation, Denver, on 1 October 1968. As a result of this review, there is some doubt that MMC can build a system that will meet all the specification requirements. Other agencies using a similar system are being contacted to determine if present commercial equipment can meet the requirements of the specification.
6. Pressure Suit Materials - A Hamilton Standard request to use suit materials that have passed NASA test criteria without further testing has been disapproved on the grounds that the NASA test criteria was less severe than the MOL criteria. This decision was coordinated with materials experts in the Aerospace Corporation Laboratory Division and the materials group at Wright-Patterson AFB.

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7. Battleship Test Plan - POGO - The Battleship Test Plan was revised at meetings on 3-4 October with the TIII SPO, Aerospace Corporation, Aerojet General Corporation, and Martin-Marietta Corporation. The current plan is to conduct a total of six tests, two on an engine test stand and four on the Battleship Test stand, with and without the POGO accumulators. The objectives of these tests, which are scheduled for early 1969, are to determine the combined effects of the MMC pre valves and accumulators on engine start transients and the dynamic characteristics of the flight configuration propellant feed system.

8. T-IIIM Trajectory Analysis - Representatives of the Systems Office, Aerospace Corporation, the TIII SPO, and Martin-Marietta Corporation attended a trajectory analysis Technical Interchange Meeting (TIM) on 16 October. The T-III SPO agreed to provide working trajectories to the MOL Systems Office for mission planning purposes after the Systems Office identifies basic mission box reference data.

9. Stage I Demonstration Program - The final demonstration test on engine SN 15 was successfully completed on 17 October 1968. This completes a program of 30 test firings of the new 15:1 expansion ratio engine. The T-IIIM Stage I engine baseline has been committed to production and these engines will be utilized on the T-IIIB program prior to the first MOL flight.

10. Acquisition Tracking System (ATS) Servo Performance - General Electric and MDAC-WD have reached a proposed solution for meeting the stiffness requirements for proper ATS servo performance, but this solution will add an estimated 60 pounds to the Laboratory Module. The Systems Office is reviewing data submitted by MDAC-WD and GE to substantiate the validity of their solution. GE has been requested to perform additional analyses to determine if the present stiffness requirements are entirely valid and if there are alternate approaches which would significantly decrease the proposed weight. The results of their studies will be delivered to the Systems Office in mid-November.

11. MOL Alignment Requirements - General Electric has proposed meeting the MOL Alignment requirements by including additional light sources and sensors in the Flight Alignment Monitor System (FAMS). This modification to the FAMS may nullify the requirement for Alignment Towers, except for those required at GE. This subject is being studied further by the associate contractors and the Systems Office.

12. Mission Module Test Equipment Design - Three system design options for the Mission Module Test Equipment (MMTE) have been submitted to the Systems Office by General Electric. Two of these options would utilize integrated designs with either Sigma II or Sigma V computers.

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The option which was recommended by GE included a modified Computer Integrated Test Equipment (CITE) version of the MMTE which would utilize a SDS 9300 computer. These options are being evaluated by the Systems Office and Aerospace Corporation to enable selection of a MMTE design in early November.

13. Support Module Data Return Vehicle Shroud - General Electric has submitted a proposal to provide a thermal shroud for each Support Module Data Return Vehicle (DRV). GE feels that insulation of this type is required to protect the nylon thermal shield from cracking when exposed to cold temperatures and to reduce the electric power required to provide heating. Alternate approaches, including the replacement of the phenolic shield with a substitute elastomeric shield material, were examined at a meeting with GE and Aerospace on 3 October. The elastomeric material would not fail at low temperature, and the feasibility of its use is being investigated further by the Systems Office.

14. Camera Optical Assembly Static Load Structure Problem - The Systems Office has continued to work toward the resolution of the Camera Optical Assembly (COA) Static Load Structure problem. A new load transformation matrix (LTM), which was prepared by Eastman Kodak, has been submitted to Martin-Marietta Corporation. Based on this LTM, MMC will prepare new loads data for use by EK in evaluating the COA structure. As an immediate approach to the Static Load Structure problem, a fix has been implemented in the test program limiting loads to establish stress distributions.

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