

AEROSPACE CORPORATION

Post Office Box 95085, Los Angeles, California 90045, Telephone 648-5000

25 November 1968

Subject: Manpower

To: MOL Systems Office (SAFSL-1/Maj Gen Bleymaier)
Los Angeles Air Force Station
Air Force Unit Post Office
Los Angeles, California 90045

I am writing you to make you aware of what I consider to be the critical state of Aerospace manpower support to the MOL program. I am bringing this subject to your attention at this point in time because in reviewing the monies allocated to Aerospace support of the program against the manpower which it furnishes as well as a review of our performance to date against those monies, I find there must be some relief in the form of additional funds or we will be faced with a drastic reduction in the manpower that can be applied to MOL and a resultant reduction in technical tasks which we will be able to accomplish.

If you will recall, I have on several occasions, presented our manpower needs for the next four years which are shown in Figure 1. As can be seen in this Figure, at this point in time of the program, our manpower should be continuing to grow. In fact, our estimate of the average manpower required in FY 1969 was of the order of 285 to 290 people. The reason for the shape of this growth curve is based on analysis of tasks to be done and is substantiated by experience in previous programs. For example, Figure 2 shows data for the Titan III Program of MTS actuals versus milestones. Similar data for the Gemini Launch Vehicle are shown in Figure 3. In both of these cases the peak manpower loads occurred near the times of the first design mission flight.

It is realized there have been stretch outs and schedule changes in the MOL program, however, the fact remains that there is more money being spent this year than in previous years and it is planned to spend an increased amount next year with the associate contractors. It is also realized that the ratio of Aerospace GSE/TD personnel to the dollar cost of the program is perhaps not a conclusive measurement and can of course be quite subjective. The data shown in Figure 4 however, illustrates that the manpower expended in MOL per unit cost is considerably below that of other successful Air Force programs.

Page Two

I still feel that the MOL manpower projections as laid out are valid and reflect the real needs of the program.

As we began to put in effect our manpower plans for this Fiscal Year our first agreement on manpower was that we would average 275 MTS for the year. These tentative agreements were verbally reached with Colonel Ledford. As the allocations for the coming year were made on or around the first of July it was obvious that the Air Force could not support the level of 275 MTS and the funds provided were \$11,000,000 from which it was estimated at that time that 236 MTS could be supported. In our subsequent discussion it was agreed and appreciated by you, that reducing our manpower to these levels would have a deleterious effect on the program. As a result you held discussions with General O'Neill in which 14 additional short term planning spaces were allocated out of the line item which raised the estimated total of MTS for the year to 250. As the costs for the year have been developed we find that the \$11,000,000 will not provide 236 MTS but rather 228. The main item in cost increase is a 3% cost of living increase but there are also other minor changes in overhead rate. This then meant our grand total, including short term planning personnel, for the year, must average 241. To go back, after you obtained the 14 short term personnel which we thought would allow us to run through the year at 250, we agreed we would make every effort to bring our charges, which were then at 280, down to 250 in an orderly fashion such that work that was underway would be completed and there would be no lapse in continuity. We made this attempt and were able to bring our charges into the neighborhood of 250 in the August to September time period. However, as work began to accumulate in the September/October time period it was impossible to accomplish the work which we set out to do in support of the program and stay with this 250 MTS level. In fact, the charges appeared to stabilize around the 260 to 265 level with an actual average of 261. These data are summarized in Figure 5.

We have made an analysis of the reason for the increase in charges in the September/October period and we find that as anticipated, a considerable percentage of our people were heavily involved in the activities associated with carrying through Project Upgrade, i. e., review of the revised Statements of Work, final review of SAFSL Exhibits, CDRL Lists and other documentation and data concerned with the supplemental agreements to be negotiated with the associate contractors. In addition, there have been fact finding activities associated with the coming negotiation of the revised contracts.

While the majority of our people were tied up in this effort, the program, of course, continued and there were numerous technical problems which required attention and needed solutions in order for the program to progress. Some of these had been around for some time waiting for the application of the proper manpower. It was realized we could not arrive at the supplemental agreements or firm contracts without decisions on these problems. Therefore, in addition to the work on the program contractual documentation we were forced to apply substantial technical talent to solution of these problems. Examples of the type of work accomplished and problems worked in this period are given in Figure 6. I would like to point out that this list is by no means definitive and does not represent all of the technical problems being worked in the program at this time.

The upshot of this increase in effort of the last months has been that with no increase in funds it will be necessary to seriously reduce the MOL manpower levels further and this will have to occur in the immediate future. The severity of the problem is illustrated in Figure 7 where in order to stay within the allocated monies we will have to average 223 MTS for the second six months of this year even including the 14 short term planning charges. Also in the previous six months we were able to bring the charges down some without a direct reduction in force in the program office since our MTS dropped from 178 to 166. In order to stay within the budget it will be necessary to drop 20 MTS in the program office around the first of the year. There will, of course, be an appropriate reduction in the effort from the Engineering Science Operations Staff. Those released from the MOL Program Office and from the Engineering Science Operations Staff will leave the company and be lost as an asset to the company since the only funds available to pay for them are MOL funds.

In order to live with this reduced level of effort there would have to be serious curtailment of tasks now accomplished by Aerospace in support of the MOL program. A listing of the candidate tasks which we are seriously considering deleting are given in Figure 8. I feel that the deletion of any one of these represents a serious degradation of the GSE/TD effort. In examining this list of recommended deletions there are certain of these items which will have to be picked up by contractual effort within the existing associate contractor structure either in direct effort or by sub-contract by them. For example, our software activities in connection with ascent and reentry guidance and/or the effort connected with the problem control center.

In considering those tasks to be deleted we also reviewed at this time tasks that we feel we have not been able to support or support to the degree required for timely effect within the program as shown in Figure 9. It should be emphasized that we are working many of these tasks but not at the level required to be fully effective in the program.

These are tasks that we could have accomplished had we been able to supply the effort that we recommended to you early this year, that is, of the order of 285 to 290 MTS. I am quite concerned with the complexity of the program, the numerous interfaces and that the program is not being adequately supported from an overall engineering standpoint.

In order to substantiate or evaluate the present status of effort we have made a review of the functions and/or tasks being accomplished by each member of the MOL program office on a man by man basis as well as an audit of their specific activities over a two week period. In addition, we reviewed tasks being accomplished by the Engineering Science Operations Staff and the MTS assigned to each of these tasks. The review has satisfied me that each of our people is indeed very gainfully employed and indeed this survey again showed areas where work was not being accomplished which needed to be done. This study is available to you and your staff for your detailed review and perusal.

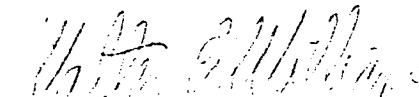
Alternatives to the major reduction in force dictated by the fixed level of \$11,000,000 have been studied. One case treated was that of maintaining the level of effort on the MOL program at its level of today of 261 MTS. This case is illustrated in Figure 10, and as can be seen that in order to maintain a level of 261 MTS equivalents it would require the MOL program to provide funds of \$920,000 for an additional 19 MTS manyears. I would like to point out that this level however, is below that which we feel is required to properly support the program. Another case treated was that of maintaining 250 MTS for the rest of the year which will be in line with the agreements of last summer but will necessitate a slow down in the solution of some critical problems in the program. This will require 13 additional manyears effort support by MOL with a cost of \$640,000. (Figure 10A)

The next chart, Figure 11, illustrates the manpower which Aerospace feels is necessary to properly carry out their responsibilities in the program. The requirements shown here are our basic requirements shown to you heretofore, adjusted for the early year actual rates. This plan would provide an average of 288 MTS for the fiscal year. The cost to MOL would be \$2.1 million dollars for an additional 46 MTS manyears.

Again I will state that I am bringing this to your attention at this time because of the criticality of the problem. This criticality is brought about by the fact that we must take action within the next few weeks to release personnel from the program or even greater reductions in the latter part of the year would be necessary. There are no funds to support MOL manpower other than those allocated by

the Systems Office except for the 14 MTS paid for in Short Term Planning. I have also discussed this matter with Dr. Getting and he shares my concern with the degree to which the Aerospace Corporation can properly support the MOL program using the levels of manpower indicated by the budget.

I will be happy to discuss all aspects of this program with you at any time and I am sure if you feel it is desirable Dr. Getting will join this discussion.

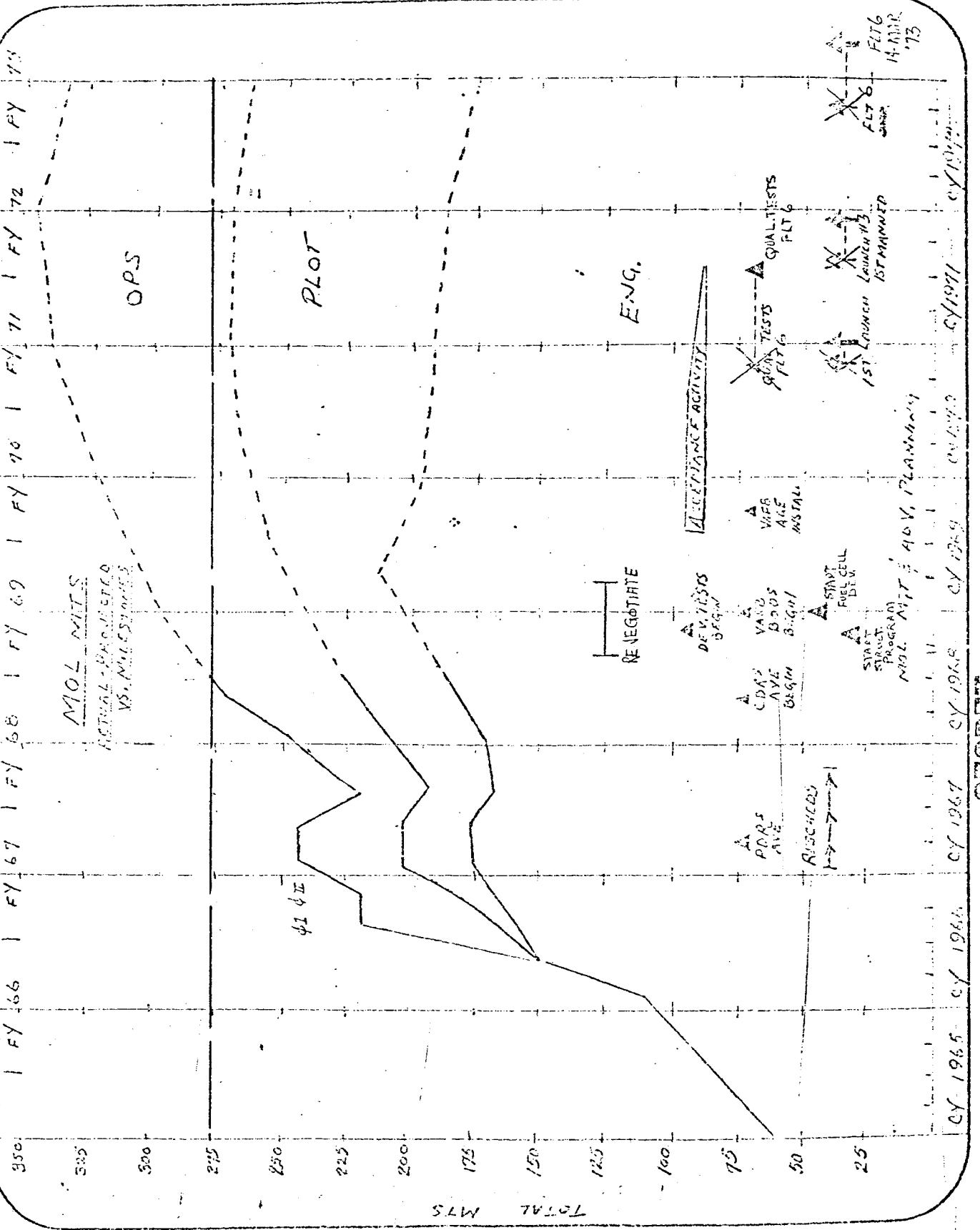


Walter C. Williams
Vice President
General Manager
MOL Division

WCW:n

Atch

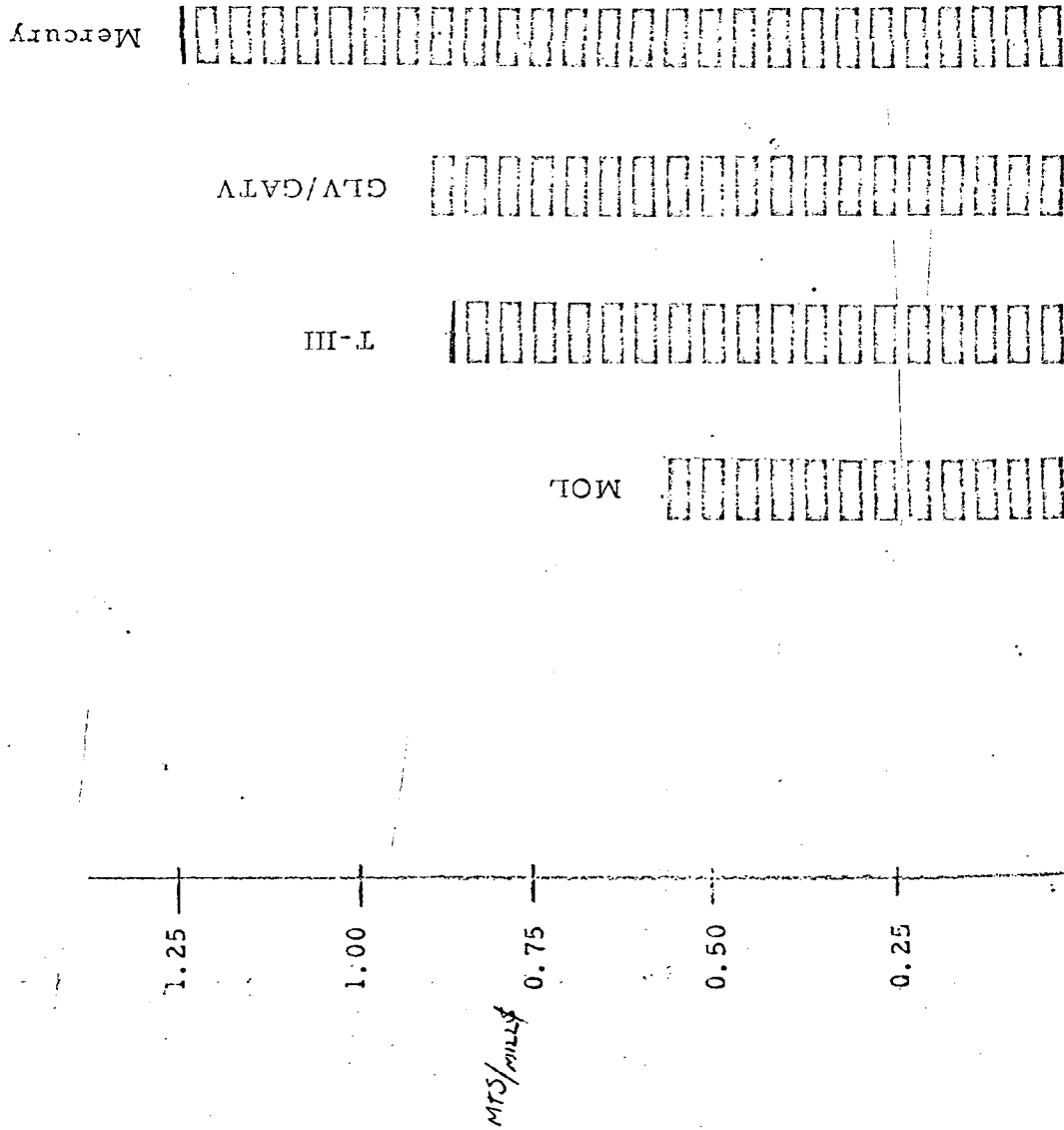
FIG 1



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MTS/Million in Phase II at a Point
Comparable to MOL-August 1968

FIG 4



11/20/68

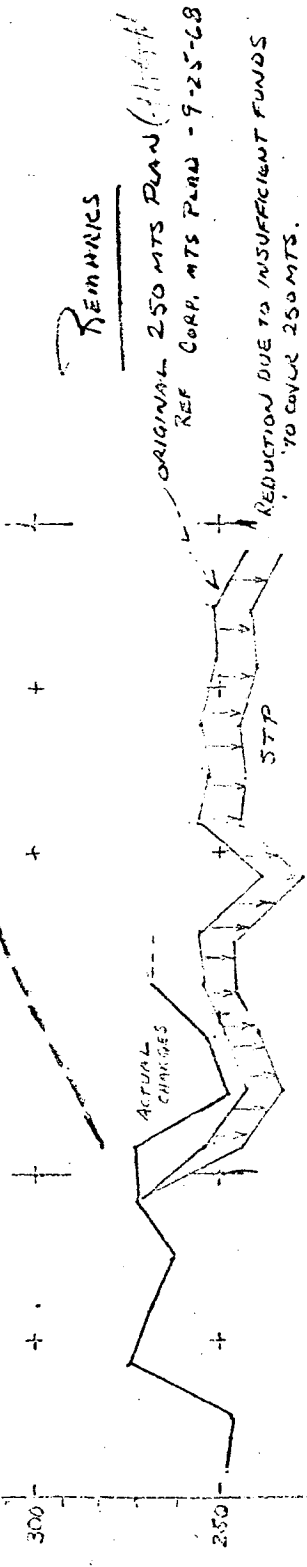
ST 10/25/1975

ONE DAY PER

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RELEASE 1 JULY 2015

MOL
PLANS VS. ACTUAL
FY 1968

EX 1968			FY 1968														
J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J



REMARKS

ORIGINAL 250 MTS PLAN
REF. CORP. MTS PLAN - 9-25-68
REDUCTION DUE TO INSUFFICIENT FUNDS
TO COVER 250 MTS.

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

MOL 236 MTS MAN YEARS
STP 14 MTS MAN YEARS
TOTAL 250 MTS MAN YEARS

DOLLAR COSTS 236 M/Y = 11,574M
PRESENT FUNDING 228 M/Y = 11,000M
DIFFERENCE 8 M/Y = 574M

(2)

WORKLOAD

Normal GSE/TD, Final Upgrade Activities, SAFSL's,
CDRL Lists, CEI Preparation, Work Statements,
Fact Finding

Major Flaps

- 1. Loads
 - Buckling failure of COA barrel
 - Check Martin work on load cycle 4
- 2. Alignment Problem
 - Get GE's attention
 - Point them toward self-contained system
- 3. Image Velocity Sensor
 - Support of O'Brien Committee
- 4. Contamination - Ground and Orbital
 - How big is the problem?
 - What to do about it?
- 5. ADS
 - Definition of MOL Requirements (6 months in advance)
 - Avoid misinterpretation of requirements
 - Evaluate alternate proposed solutions

WORKLOAD - Continued

6. Bearings
 - Potential roughness problem "Brinelling"
 - Stiffness & wear
7. Flexure Stiffness
 - Affects math. model of control system
8. 22 vs. 24 Gauge Wire
9. Wiring Harness Investigation
10. ATS Mount Stiffness
11. High Potential Test Investigation
12. Redundant Telemetry
13. Dual Gas Test Review
 - Aerospace Safety Group triggered
14. Gross Hazards Analysis

11/20/68

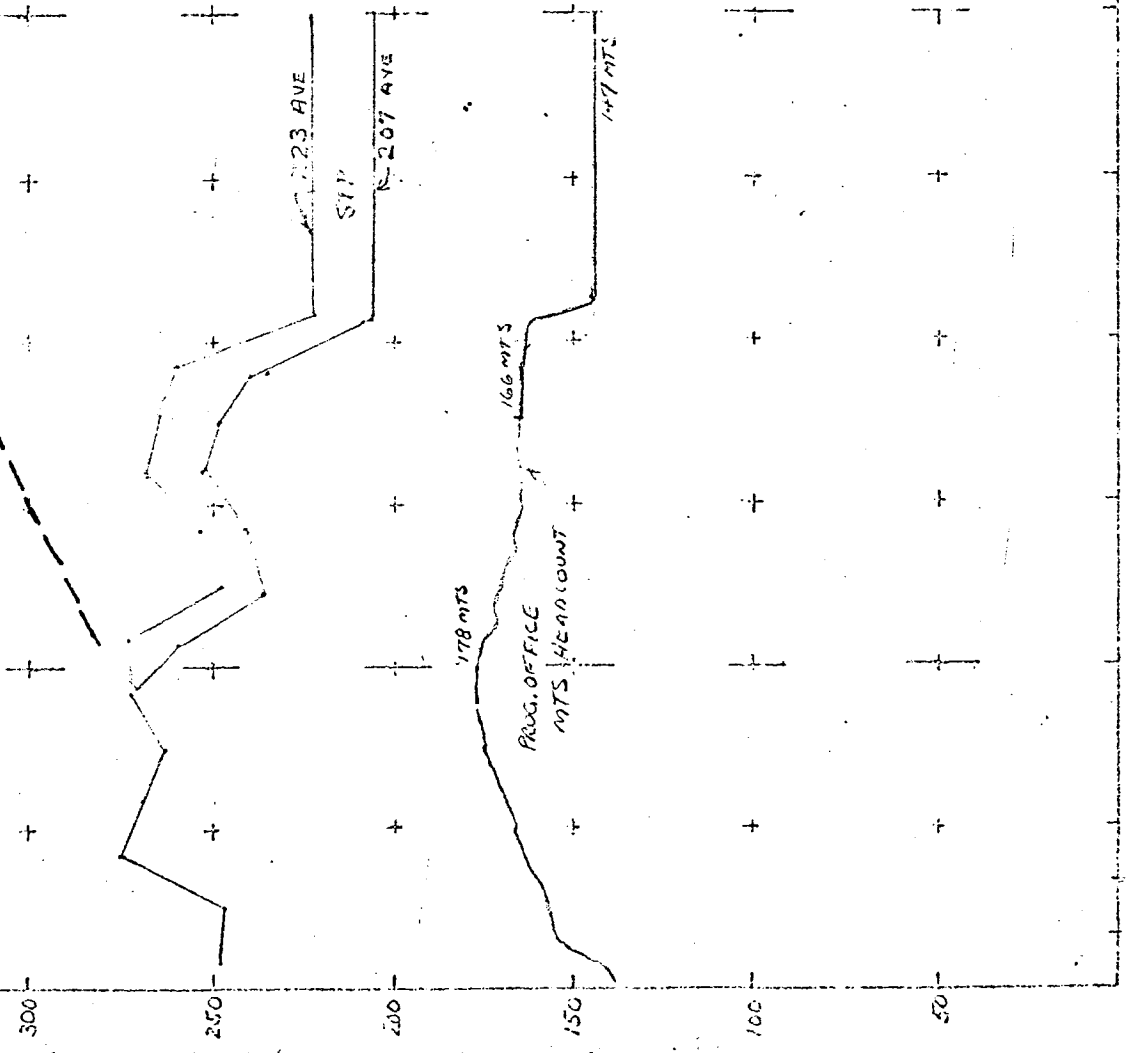
Fig 7

(10)

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RELEASE 1 JULY 2015

MOL
242 MTS RUN
FY 1969

J	F	M	A	M	J	J	A	S	O	N	O	J	F	M	A	M	J
FY 1968																	



REMARKS

• STAY WITHIN DOLLAR FUNDS (11.0M)

• SEE ATTACHED LIST OF TASKS TO BE DELETED

MOL 228 MTS MAN YEARS

STP 14 MTS MAN YEARS

TOTAL 242 MTS MAN YEARS

TASKS TO BE DELETED

22 1/2 MTS LAST SIX MONTHS OF FY-69

- o GEMINI B TO BE SURVEILLANCE (3 MTS TOTAL)
- o ELIMINATE ASCENT/REENTRY GUIDANCE SOFTWARE ACTIVITIES
- o / TO BE CONTRACTED FOR SEPARATELY BY AIR FORCE
- o ELIMINATE OR SHARPLY REDUCE EQUATION VERIFICATION WORK
- o ALL SED WORK DROPPED
- o DELETE PLANNING ON LAUNCH CONSTRAINTS
- o NO REVIEW OF COMPONENT QUALIFICATION TESTS
- o REDUCE OR DELETE PLANNING FOR AGE ACCEPTANCE
- o REDUCE EFFORT TO ESTABLISH PRODUCTION RELIABILITY INTERFACE WITH ASSOC.
- o CURTAIL EFFORT ON PLANNING FOR A PROBLEM CONTROL CENTER
- o REDUCE TECHNICAL PLANNING FOR VAFB ACTIVATION
- o REDUCT TEST PLANNING FOR LAUNCH OPERATIONS
- o REDUCE SIMULATOR EFFORT TO SURVEILLANCE
- o RECOVERY PLANNING EFFORT
- o TRAINING PLANS

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~~CONFIDENTIAL~~

SECRET

21 November 1968

TASKS REQUIRING ADDITIONAL MTS MANPOWER

- o SYSTEM ANALYSIS - DYNAMICS AND CONTROLS ANALYSIS, POINTING EQUATIONS/
COMPUTER SOFTWARE INTERFACE
- o ELECTROMECHANICAL - NAVIGATION AND CONTROL HARDWARE
- o DETAIL ANALYSIS IN SUPPORT OF OPTICAL SYSTEM
- o LAB ARRANGEMENTS, VEHICLE CONFIGURATION, SPECIAL HARDWARE HATCHES,
SEALS AND WINDOWS, EXPERIMENT INCORPORATION
- o PROVIDE GROUND AND IN FLIGHT SYSTEM LEVEL ALLOCATIONS, REQUIREMENTS
ANALYSIS AND MONITOR CONTRACTOR TASKS IN CONTAMINATION AREA.
- o EK SOFTWARE AND OPERATIONS PLANNING
- o PROCESSOR AND VIEWER
- o ERROR ANALYSIS
- o COORDINATE ALL EK SEGMENT HARDWARE TO ENSURE THAT HARDWARE MEETS
DYNAMICS AND LOADS CRITERIA. STATIC AND DYNAMIC LOAD TEST PLANNING
- o SUPPORT OF THE ABOVE INCLUDING THERMAL OPTICAL ANALYSIS
- o EASTMAN KODAK TESTING AT PHILADELPHIA AND HUNTINGTON BEACH.
- o SYSTEM LEVEL THERMAL ANALYSIS
- o GROUND SYSTEMS - ELECTRICAL AGE - INTEGRATED TESTING AT EK, GE AND DAC

SECRET
CONFIDENTIAL

FIGURE 9

~~CONFIDENTIAL~~

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TASKS REQUIRING ADDITIONAL MTS MANPOWER - Cont'd

- PRIME POWER SOURCE AND QUALIFICATION
- ANALYSIS AND EVALUATION OF ALTERNATE OPERATING MODES, TRADE STUDIES FOR ASCENT AND REENTRY TRAJECTORIES
- AVIONICS - ELECTRICAL SUBSYSTEM MONITORING, EMC EFFECTS AND GEMINI B PYROS
- MATERIALS AND SUIT DESIGN
- LV ACTIVITIES ON FLIGHT 2 INCLUDING REQUIREMENTS, OBJECTIVES, HARDWARE TRADES, INSTRUMENTATION AND TELEMETRY DATA ANALYSIS
- CREW SYSTEM INTEGRATION
- UPDATE EMILY, SUPERVISE CONTRACTOR STD EFFORTS
- ORDNANCE

FIGURE 9 (Continued)

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TASKS REQUIRING ADDITIONAL MTS MANPOWER - Cont'd

- o COMMAND AND CONTROL SOFTWARE (ADS INTERFACE)
- o ASCENT REENTRY GROUND SOFTWARE
- o INCREASE EFFORT IN ORBIT DATA HANDLING (ADS INTERFACE)
- o OPERATIONS INTEGRATION
- o SIMULATOR EFFORT
- o DEVELOP INTEGRATED TEST PLANS
- o ESTABLISH AND MANAGE CLOSED LOOP PROBLEM REPORTING SYSTEMS
- o EVALUATE AND MONITOR MOL ASSOCIATES QUALITY ASSURANCE PROGRAMS

- o MISSION PAYLOAD ENHANCEMENT
- OPTICAL SYSTEM IMPROVEMENT STUDIES
- o ALTERNATIVE MISSION ANALYSIS

- STUDIES ON ADDITIONAL MOL PAYLOAD ELEMENTS

FIGURE 9 (Continued)

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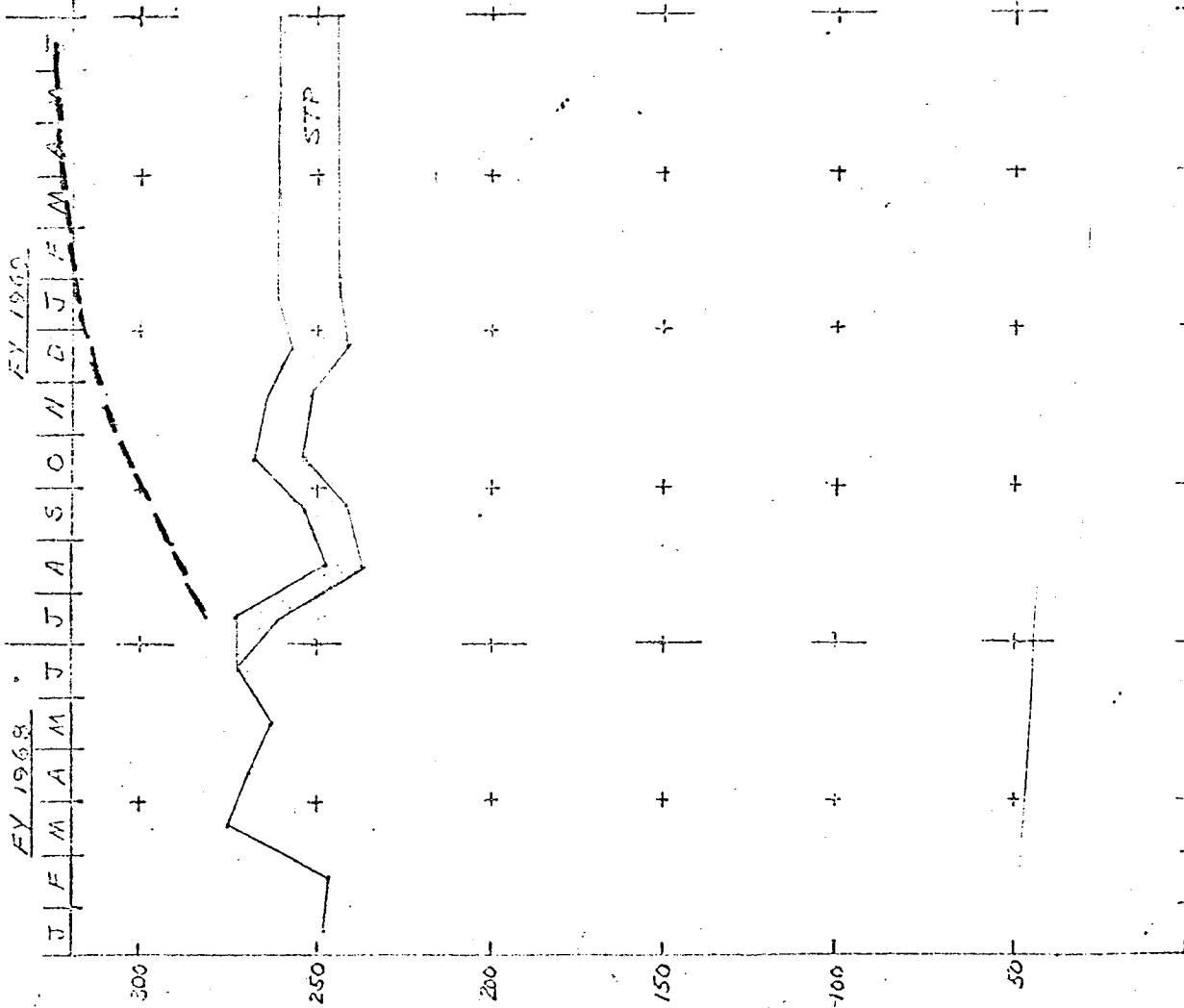
TASKS REQUIRING ADDITIONAL MTS MANPOWER ~~SECRET~~ ~~FORM~~
ESO - TECHNICAL SUPPORT DIVISION

CONTROLS ANALYSIS MAIN TRACKING MIRROR AND ATS
STRUCTURAL AND DYNAMICS ANALYSIS - ATS AND COA
ASCENT THERMAL AND DYNAMIC ANALYSIS
CONTAMINATION
ON ORBIT OPTICAL PERFORMANCE
STRAY LIGHT AND FLARE ANALYSIS
SIMULATION
OPTICS ANALYSIS AND TESTING
IVS
LAUNCH PAD AND RECOVERY OPERATIONS (*Safety*)
LAB THERMAL ANALYSIS (EC/LS)
POWER (FUEL CELLS)
CUE DISPLAY EVALUATION
REENTRY HEATING
PARTS SELECTION AND APPLICATION
RELIABILITY AND PERFORMANCE FOR 6 AND 7
DYNAMICS ANALYSIS FOR 6 AND 7

~~SECRET~~ ~~FORM~~

FIG 10

MOL
261 MTS PLAN
FY 1968



REMARKS

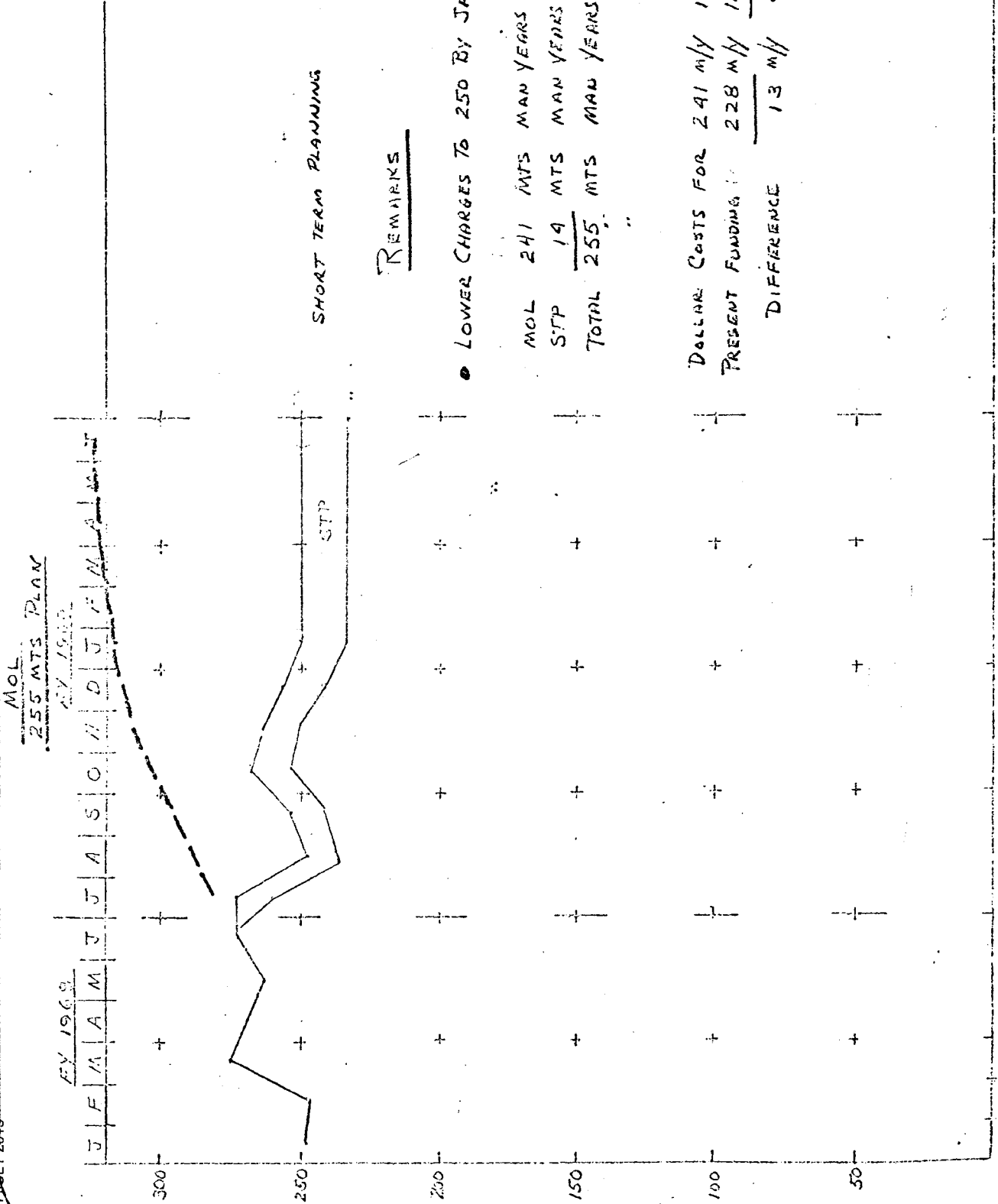
- HOLD AT PRESENT LEVEL 261 FOR THE YEAR.

MOL 247 MTS MAN YEARS
STP 19 MTS MAN YEARS
TOTAL 261 MTS MAN YEARS

DOLLAR COST FOR 247 M/Y 11,930 M
PRESENT FUNDING 228 M/Y 11,000 M
DIFFERENCE 19 M/Y 930 M

11/20/68 =

FIG
10A



REMARKS

• LOWER CHARGES TO 250 BY JAN.

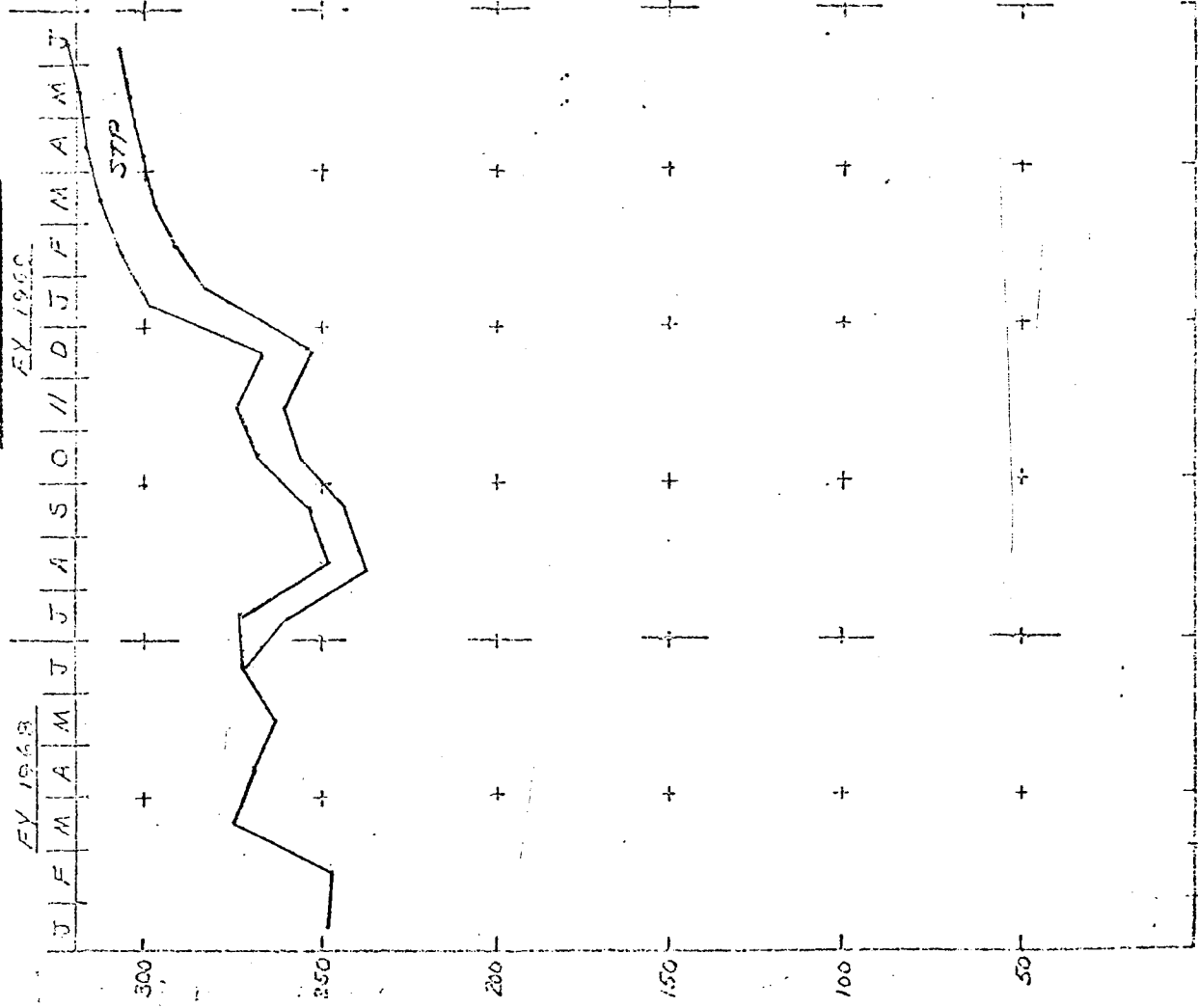
MOL 241 MTS MAN YEARS
STP 19 MTS MAN YEARS
TOTAL 255 MTS MAN YEARS

DOLLAR COSTS FOR 241 M/Y 11,610M
PRESENT FUNDING 228 M/Y 11,000M
DIFFERENCE 13 M/Y .610M

11-21-68

FIG 11

MOL
288 MTS PLAN
EX 1968



STP = SHORT TERM PLANNING

REMARKS

288 MTS TASK LIST
ATTACHED

MOL 274 MTS MAN YEARS

STP 14 MTS MAN YEARS

TOTAL 288 MTS MAN YEARS

DOLLAR COST FOR 274 M/Y 13,234M

PRESENT FUNDING 288 M/Y 11,000M

DIFFERENCE 16 M/Y 2,234M

TASKS TO BE DELETED
221 MTS LAST 6 MONTHS OF FY 69

- 1. GEMINI B TO BE SUSPENDED. (3 MTS TOTAL)
- 2. ELIMINATE ASSOCIATED/RELATED GEMINI B SUPPORT ACTIVITIES
- TO BE COMPLETED AND SUBMITTED BY APR 1969
- 3. ELIMINATE OR SIGNIFICANTLY REDUCE EQUATION VERIFICATION WORK.
- 4. ALL S&D WORK DROPPED.
- 5. DELETE PLANNING ON LAUNCH CONTINGENTS PROGRAM SUPPORT
- 6. ALL KINDS OF COMPARISON WALK, TESTS.
- 7. REDUCE OR DELETE PLANNING FOR AGILE PERFORMANCE.
- 8. REDUCE EFFORT TO ESTABLISH RELIABILITY INDICES WITH ASSOCIATED
- 9. BATTIL EFFORT ON PLANNING FOR SYSTEM CONTROL CRITICAL
- 10. REDUCE MINIMAL PLANNING FOR WAKE ACTIVATION PROGRAM.
- 11. REDUCE TEST PLANNING FOR REMOVED OPERATIONS.
- 12. REDUCE MINIMAL EFFORT TO SURVEILLANCE.

	ACTUAL JUL-OCT RATE	PLANNED FY 1968 RATE	ALLOWABLE RATE PER CURRENT AF FUNDS	FUNDING CHANGE TO MAINTAIN JUL-OCT RATE
MOL	261	250	241	+ \$ 970,000
SPECIAL PROJ.	236	226	219	+ \$ 780,000
NIKE/SENTINEL	46*	37	36	+ \$ 470,000
949	82	78	76	+ \$ 280,000
TITAN III B, C, D	150	152	158	- \$ 400,000
BRITISH ComSAT	13*	19	19	- 300,000
<u>NET CHANGE</u>				+ \$ 1,800,000

* PROGRAM OFFICE VALUES
RATHER THAN JUL-OCT RATE

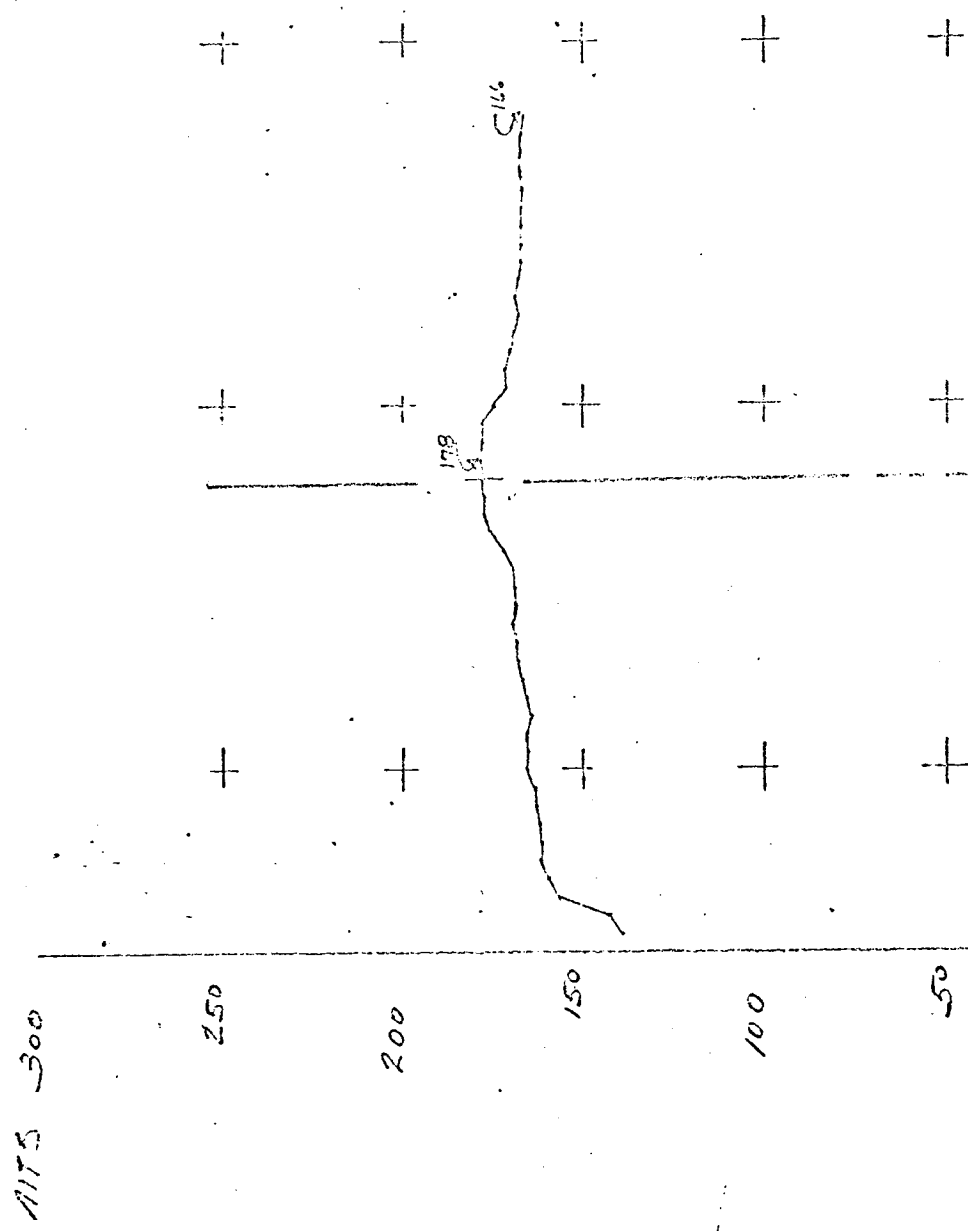
J. H. HARPIN
19 Nov 1968

OUTLINE
(AF FUNDS)

	CURRENT		PLANNED		ACTUAL		TASK-BY		ARCHITECH		ALLOWABLE	
	1512 PLAN	Jul/Oct RATE	1512 PLAN	Jul/Oct RATE	Jul/Oct RATE	TASK REQM'TS	ENGR. FORM. REQM'TS	JAN-JUN RATE	JAN-JUN RATE			
649D LINE	360	357	347					391				
DEFENSE COMSATS	23 (3)	22 (3)	18 (6)			23	33	30				
TACTICAL COMSATS	22	22	27			25	37	15				
SURVEILLANCE SATS	78 (9)	77	82 (8)			113	95	70				
SPECIAL PROJECTS	226	222	236			303		204				
SPACE EXPR. SUP.	4	4	4					4				
SATELLITE CONTROL	71	69	67			115	136	71				
F-III B,C, ED	155 (15)	152 (15)	150 (16)			205	191	166				
T-III M	50	49	49					43				
MOL	250 (14)	245 (14)	261 (11)			288	350	221				
ABRES (AF)	182 (29)	181 (29)	183 (20)			242		170				
ABRES (ARPA)	7	7	7					7				
NIKE SENTINEL	37	37	43			47	48	28				
ORBITAL ANALYSIS	1	1	1					1				
SLV II & III	19	18	19			21		20				
TRACE 66	1	1	1					1				
OGO F	1	1	0					2				
BRITISH COMSAT	19	19	16			13	15	22				
NATO COMSAT	6	6	2			7	10	10				
<u>TOTAL</u>	<u>1512</u>	<u>(70) 1490</u>	<u>1514</u>									

J. H. HARDY
19 Nov. 1968

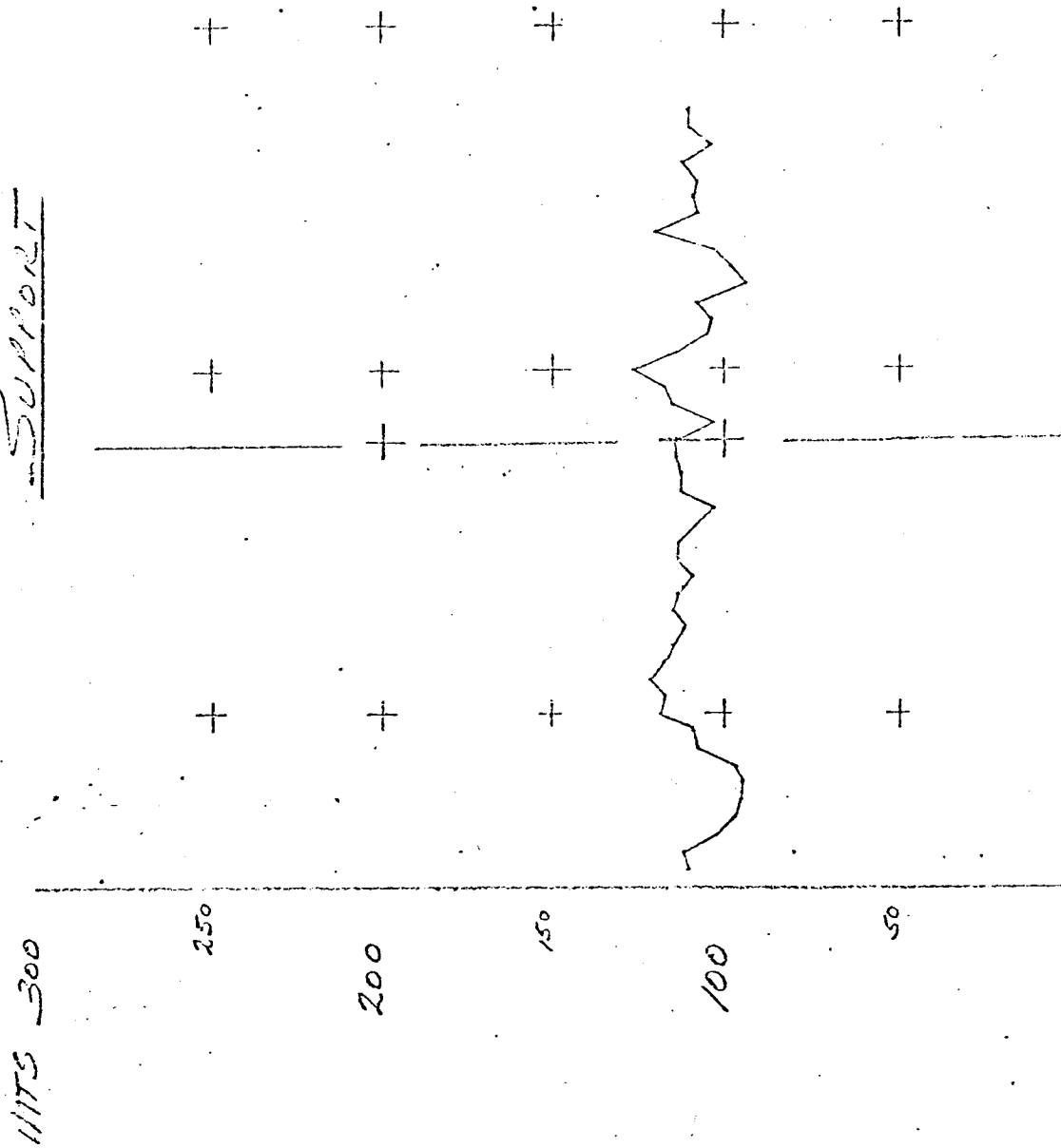
ANOL DIVISION
TOTAL HEADCOUNT



← FY 1982 - 240 Headcount
← FY 1984 - 180 Headcount

PROGRAM 632A
EQUIVALENT MITS MAN-WEEKS

SUPPORT



WEEKS ← FY1968-20th Week → FY1969-12th Week →

26 September 1968

NRO APPROVED FOR
RELEASE 1 JULY 2015

MANPOWER BUDGET
MOL DIVISION

<u>Organization</u>	<u>Division Heads</u>	<u>Total Equip Charges</u>	
			<u>OCTOBER</u>
Division Office	1	9.4	8.3
Management Systems	3	*	
Advanced Plans & Rqmts.	8	10.0	12.2
Safety	4	7.0	9.5
Engineering Directorate	2	*	
Systems Engineering	5	7.0	7.5
MAC	11	16.0	15.5
DAC	21	41.5	43.0
GE	17	29.0	33.0
Systems Analysis	12	25.2	24.2
Data Systems	15	23.9	21.5
Systems Integration	<u>11</u>	<u>20.0</u>	<u>17.4</u>
Engineering Total	94	162.6	171.8
Operations Directorate	3	*	
Flight Ops	8	13.5	12.0
Orbital Ops	12	16.2	15.6
Simulation & Crew Ops	<u>8</u>	<u>11.3</u>	<u>15.7</u>
Operations Total	31	41.0	43.3
PLOT Directorate	1	*	
Acceptance & Tech. Readiness	9	8.3	10.9
Launch Ops	9	8.9	} 12.6
VAFB	<u>3</u>	<u>2.8</u>	
PLOT Total	22	20.0	23.5
DIVISION TOTAL	<u>163</u>	<u>250.0</u>	<u>263.5</u>

* 4107-10

7 November 1968

MOL MANPOWER
CUM THROUGH OCTOBER

<u>ORG.</u>		<u>BUDGET</u>	<u>EXPENDED</u>	<u>OVERRUN</u>
SEO	MOL	545.1	575.0	<29.9 >
	STP	39.0	31.5	7.5
	TOTAL	584.1	606.5	<22.4 >
ESO	MOL	362.1	382.5	<20.4 >
	STP	13.9	15.3	<1.4 >
	TOTAL	376.0	397.8	<21.8 >
DEV	MOL	7.8	6.0	1.8
	STP	2.0		2.0
	TOTAL	9.8	6.0	3.8
LABS	MOL	12.0	19.7	<7.7 >
	STP			
	TOTAL	12.0	19.7	<7.7 >
TOTAL	MOL	927.0	983.2	<56.2 >
	STP	54.9	46.8	8.1
	TOTAL	981.9	1030.0	<48.1 >

MOL MTS REQUIREMENTS

Tasks	Authorized FY-69			Required FY-69			Remarks
	Div.	Supt.	Total	Div.	Supt.	Total	
General Manager	1.0		1.0	1.0		1.0	
Group Directors	5.0		5.0	5.0		5.0	
Advanced Plng. & Rqmts.	7.0	3.0	10.0	7.5	3.5	11.0	
Schedules	.5		.5	.5		.5	
Configuration Mgmt.	9.5		9.5	9.5		9.5	
Negotiations Support	13.5	5.0	18.5	13.5	5.0	18.5	
STD	1.0		1.0	2.0		2.0	To cover STD--Present effort maintaining SPDR and 20 SAFSL Exhibits
Systems Analysis	3.5	8.0	11.5	3.5	8.0	11.5	
Analysis	4.5	3.0	7.5	5.5	3.0	8.5	Establishment of and reviewing reliability and qualification Programs w/assoc. contr.
AVE Software	5.0	7.0	12.0	5.5	8.0	13.5	Additional effort in AVE equation Dev. and Validation
Design Development	5.0	2.0	7.0	5.0	2.0	7.0	
Requirements	5.5	6.0	11.5	6.5	7.0	13.5	
Subsystem Development	4.0	10.0	14.0	5.0	10.5	15.5	More effort on details of Technical
Struct. Thermo, Dyn. Etc.	2.6	3.0	5.6	3.0	3.0	6.0	Direction, e.g. contamination, Orbital
Power	2.5	3.0	5.5	2.5	3.0	5.5	Dynamics, fuel cells
Navigation	2.3	1.0	3.3	2.5	1.5	4.0	
Communications	1.0	2.0	3.0	1.0	2.0	3.0	
Telemetry	3.2	.5	3.7	3.2	.5	3.7	
Instrum., Monitor & Alarm	2.5	.5	3.0	2.5	.5	3.0	
Command							

MOL MTS REQUIREMENTS

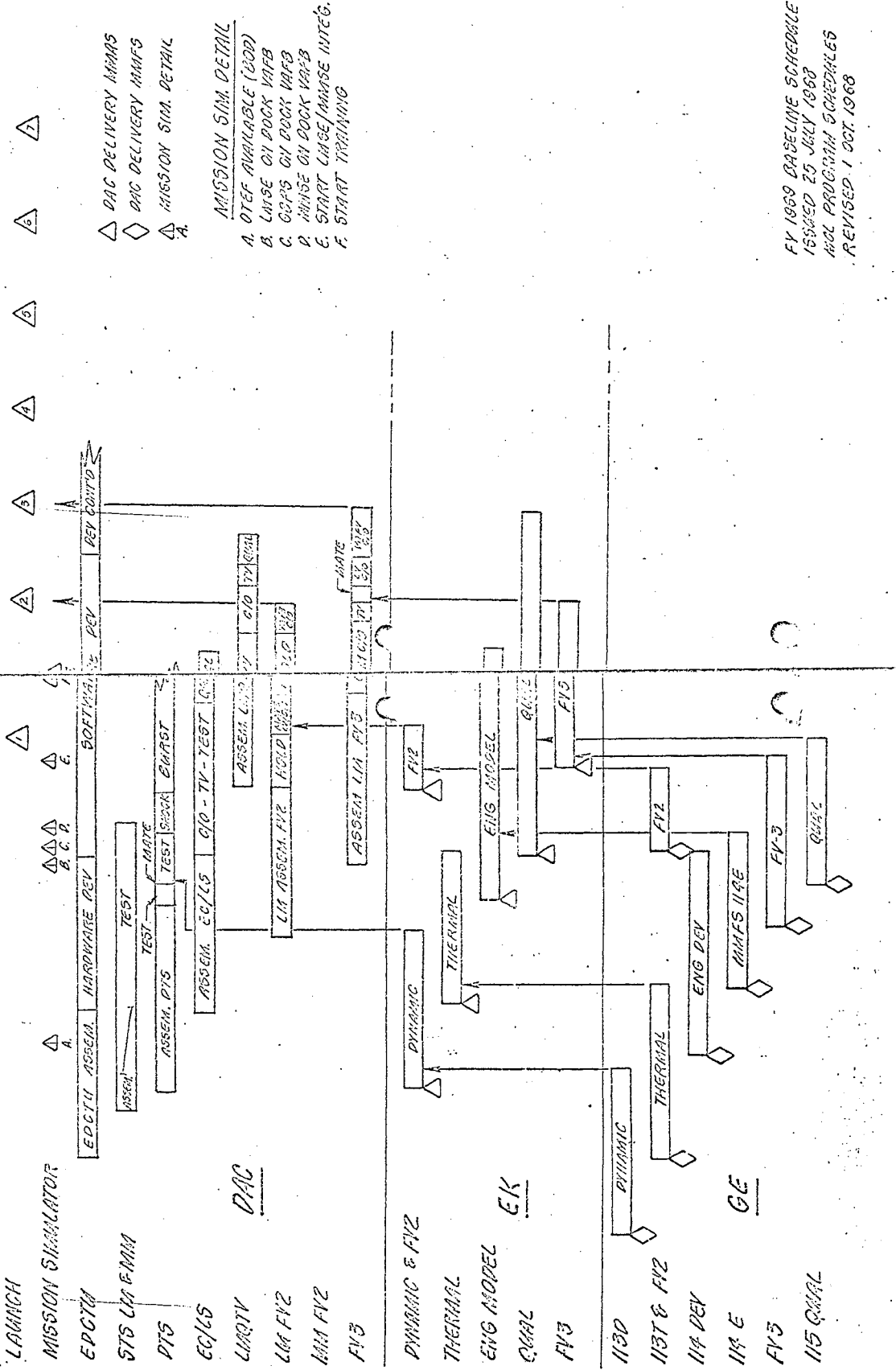
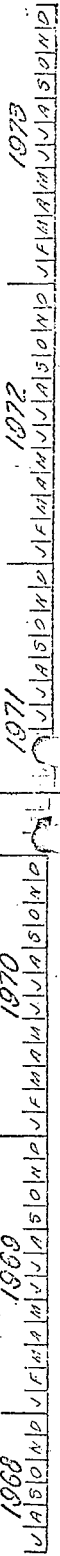
Tasks	Authorized FY-69			Required FY-69			Remarks
	Div	Supt	Total	Div	Supt	Total	
Computer	1.0	1.0	2.0	1.5	1.0	2.5	More effort on details of Technical Direction, e.g. contamination, Orbital Dynamics, fuel bells
ACTS & Propulsion	2.5	2.0	4.5	2.5	2.0	4.5	
Life Support	1.0	3.0	4.0	1.8	3.0	4.8	
Crew Systems	1.5	4.5	6.0	2.5	4.5	7.0	
AGE	6.0	5.0	11.0	6.0	5.0	11.0	
Develop. & Qual. Test	9.5	7.0	16.5	10.5	7.5	18.0	Support of Manned Alt. Chamber Test Prog.
Systems Integration							
System Allocations	2.5		2.5	2.5		2.5	
Technical Interface	6.5	4.0	10.5	6.5	4.0	10.5	
Safety	3.5	3.5	7.0	4.5	6.3	10.8	Surveillance of contractors safety effort - Syst. level safety Integ & Maths Analysis
Acceptance Program	4.5	1.0	5.5	6.0	1.5	7.5	Planning & review for acceptance activities
System Test Program	1.0		1.0	2.0	.5	2.5	Devel. of reqmts & methods for integrated test effort
Launch Operations							
Launch Ops Planning	3.0	.5	3.5	4.0	1.5	5.5	Coverage of maintainability prog., launch constraints & range support planning
Launch Systems	3.5	1.0	4.5	5.0	1.5	6.5	Additional effort of site activation effort
Flight Operations							
Ascent & Reentry	2.0	2.0	4.0	3.0	3.6	6.6	TRW now on contract, must follow ascent & reentry development
Recovery	2.0		2.0	2.0		2.0	
Ground System Integration	2.0	3.0	5.0	3.5	3.5	7.0	Software Test Programs, monitoring ADS and mission rules
Flight Documentation	2.0		2.0	2.0		2.0	

MCL MTS REQUIREMENTS

Tasks	Authorized FY-69			Required FY-69			Remarks
	Div	Supt	Total	Div	Supt	Total	
Orbital Operations							
Ground Systems Software	2.5	2.0	4.5	4.5	4.0	8.5	3 software programs - 1 covered by consultant - all falling behind schedule
Data Handling	1.0		1.0	1.5	.5	2.0	Develop data handling reqmts to establish reqmts for software, display & hdwe develop
Operations Integration	2.5	1.0	3.5	3.0	1.5	4.6	Flight Operations Planning Group activities increasing - not sufficiently covered
Operations Studies	1.0	.5	1.5	1.0	.5	1.5	
Simulator Development	4.9	4.0	8.9	5.8	5.0	10.8	Validation of software, integration of simulators GE-DAC, & debug & checkout (heavy load March)
Simulator Ops & Training	2.0	1.0	3.0	2.0	2.0	4.0	Simulator operation generation of expts. & execution of specific tasks
Offsite Operations							
WTRO (VAFB)	3.0		3.0	3.2		3.2	Begin buildup at WTRO - Last Quarter
STC							
Factory Reps							
TOTAL	150.0	100.0	250.0	171.5	116.9	288.0	

63

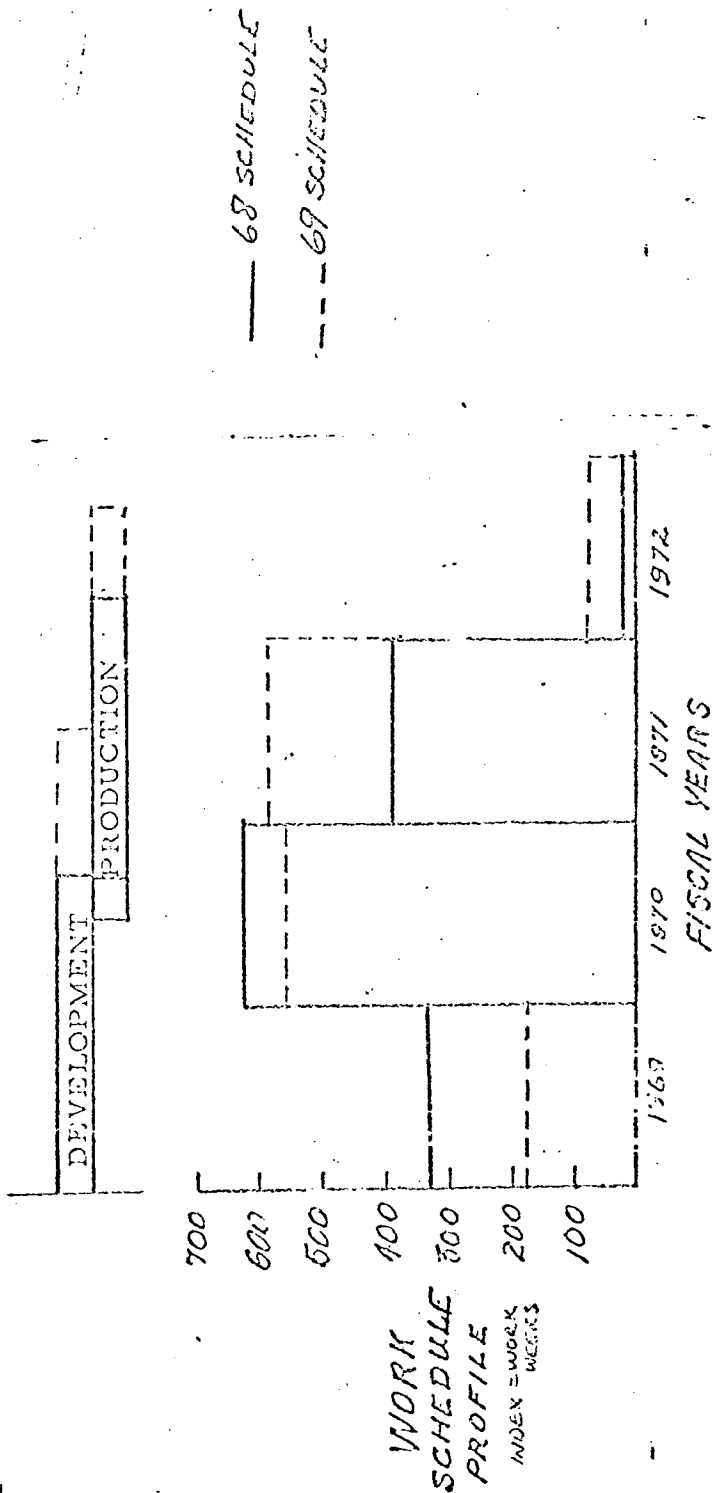
MOL PROGRAM MASTER SCHEDULE



- △ DAC DELIVERY MNF'S
- ◇ DAC DELIVERY MNF'S
- △ MISSION SIM. DETAIL
- A. MISSION SIM. DETAIL
- B. OTEF AVAILABLE (200)
- C. MNFSE ON DOCK VAFB
- D. GCP'S ON DOCK VAFB
- E. MNFSE ON DOCK VAFB
- F. START MNFSE/MNFSE INT'G.

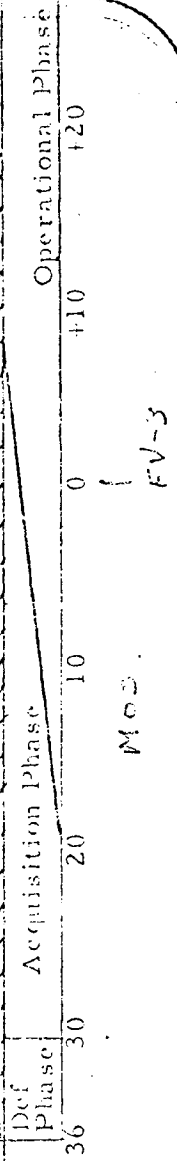
FY 1969 BASELINE SCHEDULE
ISSUED 25 JULY 1968
MOL PROGRAM SCHEDULES
REVISED: 1 OCT 1968

OTHER RISKS
MDAC-WD 68 SCHEDULE COMPARED TO 69 SCHEDULE
MASTER SCHEDULE



OTHER CONTRACTORS FOLLOWED THIS SAME PATTERN

	Component - Subsys - Sys - Software
Hardware/Software Development	Component - Subsystem - System
Hardware/Software Qualification	LR E
Power "On" Flight Hardware	M T GB LM P M JL Q
Last Unit Accepted FV-5	LR E MM LV GB MM P P
FACI	MM P P
<u>Lead Responsibilities (PLOT)</u>	
Product Reliability	
System Acceptance Test Mgmt	
Technical Acceptance AVE	
Launch Operations FV	
Flight Readiness Determination	
<u>Lead Responsibilities (Engineering)</u>	
Design, Requirements AVE/AGE	
Test, Requirements AVE/AGE	
Dev, Qual Test Mgmt	
Interface Control	
Configuration Mgmt	
Tech OPR-Each Associate Contr.	
<u>Lead Responsibilities (Operations)</u>	
Flight Operations	
Orbit Operations	
Simulation	



SAFETY OFFICE

R. R. Wolfe - Director
J. G. Urban - Assistant

Staff

T. D. Collison
A. Gaylord

MCL SAFETY OFFICE

T. D. COLLISON
MTS
DEVELOP CRITERIA AND ADMINISTER PROGRAM FOR SYSTEM LEVEL
ORDNANCE REQUIREMENTS. SUPPORT ALL SEGMENT OFFICES FOR
INCORPORATION OF, AND CONTINUOUS REVIEW OF ORDNANCE REQUIRE-
MENTS TO MEET MIL SPEC AND WTR REQUIREMENTS. ALSO
RESPONSIBLE FOR DIRECTING LAUNCH PHASE SAFETY INTEGRATION
WORKING GROUP.

MTS
DIRECT THE ASCENT CREW SAFETY WORKING GROUP TO CONTINUE
REVIEW OF SYSTEM HARDWARE TO ASSURE HARDWARE AND PROCEDURES
IMPLEMENT SAFETY REQUIREMENTS. INITIATE AND DIRECT TRADE
STUDIES FOR BOTH INHOUSE AND CONTRACTOR EFFORT REGARDING
DETAILED SAFETY CRITERIA

MTS
DIRECT THE ON-ORBIT CREW SAFETY WORKING GROUP TO DEVELOP
INTEGRATED REVIEW OF HAZARDS FOR THIS MISSION PHASE. DEVELOP
CRITERIA FOR HARDWARE AND PROCEDURAL CHANGES TO REFLECT
SAFETY CONSIDERATIONS. INITIATE AND DIRECT INHOUSE AND
CONTRACTOR TRADE STUDIES FOR CRITERIA DEVELOPMENT.

SYSTEMS ENGINEERING

J. Meltzer - Director

A. R. Blackwell
R. J. Carrington
R. E. Finney
D. E. Gibbsman
R. P. Toitant

November 1968

SYSTEMS ENGINEERING OFFICE

INDIVIDUAL TASK DESCRIPTIONS

Office Duties - GSE/TD and integration of Flight 6 & 7, the automatic version of MOL.

J. Meltzer - Director - Overall direction and integration of the Flight 6 and 7 mission requirements and their implementation into system design. Compatibility assurance of Flight 6 and 7 design to the Manned MOL Program; also, thermal integration.

R. Carrington - Structural compatibility of the airborne vehicle, aerodynamic design and testing, orbital dynamics requirements and analysis, and Lab Module space allocation. Airborne vehicle loads integration with booster contractor.

R. Finney - Flight 6 and 7 test program, factory-to-pad assembly and test schedule control. AGE, exchange hardware and facility design integration and requirements. All test and ground systems associated with the automatic flights.

A. Blackwell - Integration of instrumentation, telemetry and command system requirements. DRV and film handling system design including related electro-mechanical compatibility.

E. Hibsman - Flight 6 and 7 interface compatibility and interface documentation. Systems Requirements integration of top program compliance documents: SP/DR, Program Exhibits, System Engineering Documentation (SED), Contractor Work Statement compatibility, systems effectiveness compatibility.

NOV 1968

Systems Engineering Office
Page -2-

R. Toutant

Compatibility assurance of contractor documentation: CEI Specifications, functional flow diagrams (FFBD), contractor plans, requirements analysis sheets (RAS), interface specifications. Coordination of Flight 6 and 7 mission simulator requirements.

(J. Meltzer)* -

Thermal integration and analysis of the film supply, film transport and recovery systems, DRV's, fairings, and the overall Flight 6 and 7 heat transfer area.

(R. Finney)* -

AGE and exchange hardware design and analysis.

(A. Blackwell)*
(as available)

Power systems design, power allocation, electrical/electronic systems design. Electronics integration of overall Flight 6 and 7 vehicle.

* Currently subdivision carrying some program office load.

WORKING MATERIAL

MAC OFFICE
W. D. Pittman - Director
F. W. Buehl - Associate

— Staff

R. K. MacMaster

MECHANICAL
SYSTEMS
A. Green

L. G. King
D. L. Mumper

AVIONICS & AGE
C. Plank

I. K. Egashira
B. Katz

SYSTEMS ANALYSIS
A. E. Blanciak

W. A. Germain

SUIT
DEVELOPMENT
R. S. Swope

Gemini B and Pressure Suit Assembly Segments

- W. D. Pittman - Segment Systems Engineering Director - overall cognizance of MDAC-ED and Ham. Std technical requirements/performance and assignments/monitoring of work in Aerospace System Office. Provides Technical Direction to Contractor through Air Force System Office.
- F. W. Buehl - Associate Systems Engineering Director - backup to Segment Director on overall System Office responsibilities with specific ongoing responsibilities for inter-segment integration of test programs and interfacing activities involving MDAC-ED and Ham. Std.
- A. Green - Manager, Mechanical Systems - monitors MDAC-ED work and initiates in-house studies for structures, propulsion, ECS, Mechanical AGE and Crew Transfer.
- L. G. King - MTS Mech. Sys. - reviews contractor planning and monitors analysis and test of Gemini B structure for satisfaction of requirements for strength, dynamics and separation functions. Co-ordinates technical subdivision studies in this area.
- D. Mumper - MTS Mech. Sys. - reviews contractor planning and monitors analysis and test of Gemini B life support and environmental control. Co-ordinates technical subdivision studies and support in this area and for similar effort on Gemini E propulsion and Mechanical AGE.
- C. Plank - Manager, Avionics - responsible for monitoring contractor effort and initiating in-house studies for guidance and control, communications, telemetry, crew displays, electrical, EMC and pyrotechnics.
- I. K. Egashira - MTS Avionics - reviews contractor planning and monitors analysis and test of electronics for Gemini B guidance system for ascent and re-entry, and for communications and telemetry. Co-ordinates interface with T-III and technical subdivision studies.
- B. Katz - MTS Avionics - responsible for technical requirements, and monitoring contractor efforts for development of ascent guidance equations. Co-ordinates in-house technical subdivision effort for checking development and validation of equations.
- () - MTS Avionics - electrical subsystem monitoring and evaluation of batteries and power distribution. Also electromagnetic susceptibility of Gemini B pyrotechnic devices. (Formerly S. Moskwa)
- A. Blanciak - Manager, Analysis - responsible for initiating in-house analyses for ascent performance and abort modes, re-entry trajectories and crew safety during ascent/re-entry. Monitors contractor plans, analyses and wind tunnel tests for these areas.
- W. A. Germain - MAS Staff - provides segment representation to configuration control board, co-ordinates ECP and IFS documentation, and initiates follow-up on action items for Gemini B and PSA.
- () - MTS Analysis - performance and system analysis background to assist in evaluating alternate operating modes and trade studies for ascent and re-entry trajectories.

Gemini B and Pressure Suit Assembly Segments

Page 2

- R. MacMaster - MTS Staff - responsible for test integration and status of qualification for Gemini B. Co-ordinates test planning and monitors tests in association with MOL System Office Test Directorate and Contractor.
- R. S. Swope - Manager, Pressure Suit Assembly Segment - responsible for technical requirements and monitoring of contractor effort for PSA development and associated ACE.
- () - MTS PSA Segment - Specialist in materials and suit design to assist in evaluating alternative development designs and proposed changes by contractor.

DAC OFFICE
K. G. Graff - Director

LAB MODULE
F. W. Delina
W. C. Hayden

AEROMECHANICS
K. G. Graff - Actg
G. H. Smith
M. Cole

EC/LS &
CRYOGENICS
R. H. Lee
R. E. Thompson
R. D. Haug

ACTS &
PERFORMANCE
L. K. Herman
A. R. Maffei
D. E. Richard

POWER SYSTEMS
W. T. Sheng
D. C. Lu

MECHANICS AGE
& FACILITIES
K. G. Graff - Actg
E. K. McCrary
C. G. Rose

TEST
F. J. Benedetti
L. T. Stricker
W. C. Hanson

ELECTRONIC
EQUIPMENT
R. U. Moody

DAC LABORATORY VEHICLE OFFICE

L. K. Herman Manager of Attitude Control and Propulsion. Performs technical and project work in these and performance areas and maintains cognizance of DAC Work Statement.

R. U. Moody Performs project functions in electronics and operations areas and has responsibility for crew equipment and electrical umbilical. Also works displays and controls and interface with Gemini B.

F. W. Belina Manager of Lab Module and maintains cognizance of lab arrangements and CEI. Special activities include the launch ascent signals, ejections and separation, and the general problem of contamination. Presently assigned to projecting the incorporation of SAFSL's into CEI's.

W. C. Hayden Coordinates all interface activity and ECP's and establishes and maintains records of dispositions. Responsible for many items of exchange hardware.

L. T. Stricker Responsible for major systems tests activities at Huntington Beach and associated documentation. Performs integration support of inter-contractor test activities.

A. R. Maffie Responsible for attitude control and propulsion system hardware, including analysis, design and test. Performs major functions in contamination mitigation and testing.

R. E. Thompson Responsible for the cryogenic supply system and liquid thermal control loop hardware and related activities.

G. H. Smith Responsible for structural and mechanical design and analysis with emphasis on the mission module structure and contractor interfaces.

R. Herndon Manager of structures and mechanical systems and associated activities. Performs integration role across the orbiting vehicle for loads and structural analysis.

D. E. Richard Responsible for attitude control and translation system electronics hardware and performance evaluation thereof.

R. D. Haug Responsible for environmental control system and waste management systems and associated analyses and tests.

R. H. Lee Manager of environmental control and life support systems. Performs cognizance of contractor interfaces in the environmental control areas and performs safety related tasks in materials selection, control and testing.

M. Cole Responsible for structural design and analysis with emphasis on the Lab Module and the Gemini B interfaces.

D. C. Lu Responsible for electrical power system integration and test activities and provides project office support for the Work Statement.

W. T. Sheng Manager of the electrical power system and related activities, including wire harness and power consumption. Provides project management for all SAFSL's applicable to DAC.

W. C. Hanson Responsible for review and coordination of changes to DAC ground test plans and analysis and update of test environments.

F. J. Benedetti Manager of all testing activity being performed at DAC. Responsible for system level tests and coordination of subsystem testing and related activities.

C. Rose Responsible for mechanical AGE hardware, DAC facilities mods, and certain exchange hardware. Provides support of interface activities and documents.

E. K. McCrary Responsible for mechanical AGE hardware with emphasis on fluid handling systems.

Project engineer for expediting Laboratory Vehicle activities for Flight 2, including requirements, objectives, hardware tradeoffs, instrumentation and telemetry, data analysis and validation of milestones.

Staff Engineer for assuring rapid integration and coordination of project problems and briefings. Contractual implementation activity and special problem assignments.

----- Responsible engineer for ordnance hardware design,
analysis, and test verification.

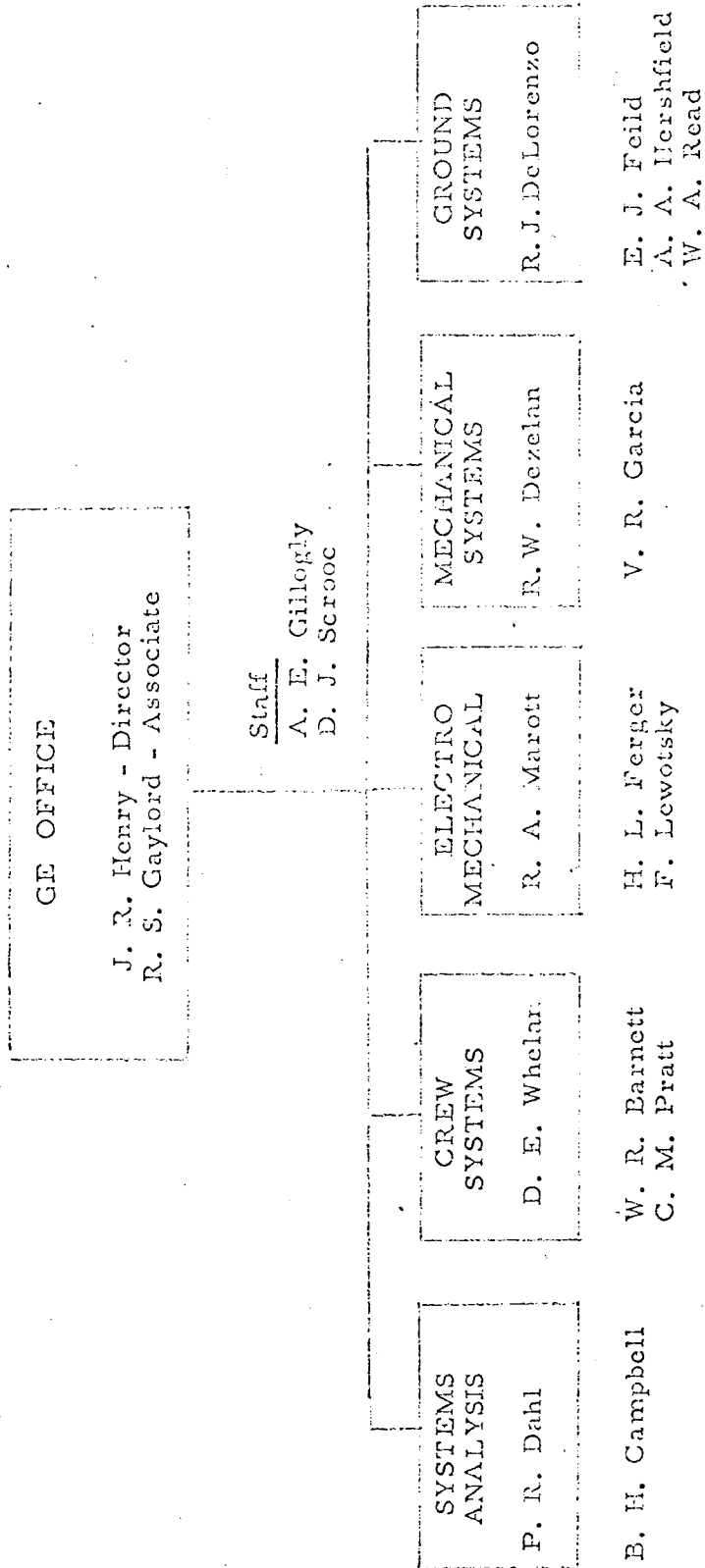
----- Mechanical design engineer for hardware development
in areas of lab arrangements, vehicle configuration,
and experiment (ESE-1) incorporation. Activities to
include special hardware such as hatches, windows
and seals.

----- Electronics engineer for performing project functions
and integration of electronics area.

----- Electrical engineer to be responsible for the prime
power source development and qualification.

ACTIVITIES OF WEEK 7 OCT. & 14 OCT. 1948

1. Maintained cognizance of LVO activities and performed management coordination, technical interchange, and direction of personnel.
2. Reviewed and dispositioned all ECP's relating to DAC activities.
3. Prepared and presented (both in-house and to AF) briefings on:
 - (a) Structural Integration
 - (b) Open interface areas having potential impact.
4. Coordinated and attended TSOM #7 including pre-meetings, agenda reviews, problem coordination, and reviewed and signed off all documents presented which pertained to DAC.
5. Interfaced with the AF and DAC primarily in the areas of technical negotiations of the Lab Module CBI, the CCN and basic Work Statements, the RCI list and SAFSL disagreement items.



~~SECRET/DORIAN~~

GENERAL ELECTRIC

J. R. HENRY

DIRECTOR - NEGOTIATIONS, SP/DR AND
SPECIFICATION REWRITE

R. S. GAYLORD

ASSOC. DIRECTOR - NEGOTIATIONS, CEI SPEC,
CONTROL FOR TRACKING MIRROR AND ATS

A. E. GILLOGLY

STAFF ENGINEER - A TASK LEADER FOR
NEGOTIATIONS, ECP'S AND PROPOSALS

D. J. SCROOC

STAFF ENGINEER - NEGOTIATIONS, IFS,
CONTAMINATION, AND SAFETY

P. R. DAHL

MANAGER, SYSTEMS ANALYSIS - CONTROL ANALYSIS
OF STABILITY FOR TM AND ATS DRIVE, SYSTEM
REQUIREMENTS - A TASK LEADER FOR NEGOTIATIONS

B. H. CAMPBELL

SYSTEMS ANALYSIS - AVE EQUATIONS, HARDWARE/
SOFTWARE COMPUTER INTERFACES

(1 MTS)

SYSTEMS ANALYSIS - DYNAMIC ANALYSIS, CONTROLS
ANALYSIS, POINTING EQUATIONS/COMPUTER
SOFTWARE INTERFACE

~~SECRET/DORIAN~~

~~SECRET~~/DORIAN

GENERAL ELECTRIC

D. E. WHELAN	MANAGER, CREW SYSTEMS - ATS AND CREW INTERFACES
W. R. BARNETT	CREW SYSTEMS - CONSOLES AND DISPLAYS
C. M. PRATT	CREW SYSTEMS - CONTROL SYSTEM HARDWARE FOR ATS
R. A. MAROTT	MANAGER, ELECTROMECHANICAL - IVS
H. L. FERGEE	ELECTROMECHANICAL - NAVIGATION AND CONTROL HARDWARE, ALIGNMENT
F. LEWOTSKY	ELECTROMECHANICAL - GE ELECTRICAL AND DOOR DRIVE
(2 MTS)	ELECTROMECHANICAL - NAVIGATION AND CONTROL HARDWARE-E.G., STAR TRACKERS, TORQUES, BEARINGS, GYROS, ETC.

~~SECRET~~/DORIAN

~~SECRET~~/DORIAN

GENERAL ELECTRIC (CONT'D)

R. W. DEZELAN

MANAGER, MECHANICAL SYSTEMS -
DYNAMICS AND STRUCTURAL ANALYSIS

V. R. GARCIA

MECHANICAL SYSTEMS - MECHANICAL DESIGN,
DOOR STRUCTURE AND THERMAL, WEIGHT AND
ENVIRONMENTAL CONTROL OF TM BAY

(1 MTS)

MECHANICAL SYSTEMS - MECHANICAL INTERFACES,
STRUCTURAL TESTING AND THERMAL

R. J. DE LORENZO

MANAGER, GROUND SYSTEMS - SYSTEM TEST

A. HERSHFIELD

GROUND SYSTEMS - MECHANICAL AGE AND
FACILITIES

W. A. READ

GROUND SYSTEMS - GROUND TEST PLAN, DSS-1
TESTING AND EDCTU

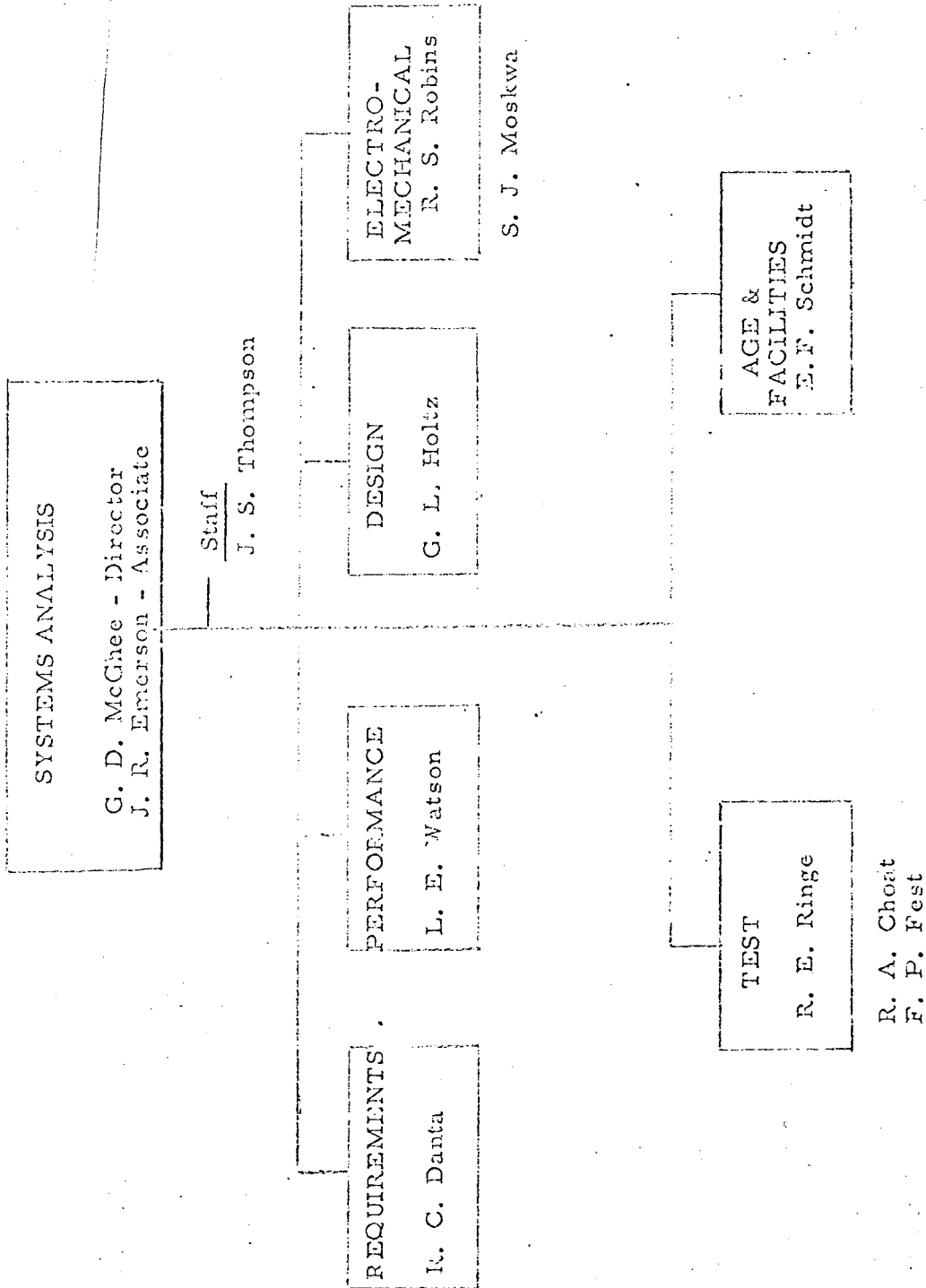
E. J. FEILD

GROUND SYSTEMS - EXCHANGE HARDWARE
AND CDRL

(1 MTS)

GROUND SYSTEMS - ELECTRICAL AGE, INTEGRATED
TESTING AT EK, GE AND DAC

~~SECRET~~/DORIAN



~~SECRET~~/DORIAN

EK SEGMENT OFFICE

G. D. MC GHEE
SYSTEMS ENGINEERING DIRECTOR. RESPONSIBLE FOR
OPTICAL AND PHOTOGRAPHIC PERFORMANCE OF THE DORIAN
PAYLOAD AND FOR TECHNICAL DIRECTION OF THE EASTMAN
KODAK CONTRACT.

J. R. EMERSON
ASSOCIATE SYSTEMS ENGINEERING DIRECTOR. SHARES THE
ABOVE RESPONSIBILITIES.

R. DANTA
MANAGER OF REQUIREMENTS ANALYSIS. RESPONSIBLE FOR
DOCUMENTATION OF SYSTEMS AND SEGMENT-LEVEL
REQUIREMENTS, INCLUDING WORK SPECIFICATION AND
MANAGEMENT OF AEROSPACE PARTICIPATION IN CONTRACT
NEGOTIATIONS.

L. E. WATSON
MANAGER OF THE OPTICAL PERFORMANCE SECTION.
RESPONSIBLE FOR MANAGING THE AEROSPACE EFFORT
RELATING TO PAYLOAD OPTICAL PERFORMANCE, OPTICAL

~~SECRET~~/DORIAN

HANDLE VIA DYEMAN
CONTROL SYSTEM ONLY

~~SECRET~~/DORIAN

EVALUATION OFFICE

L. E. WATSON
(Cont'd)

TEST METHOD VALIDATION, INSTRUMENTATION, ACCURACY, AND OPTICAL TOLERANCE BUDGETS, VALIDATION OF CONTRACTOR OPTICAL PERFORMANCE TECHNIQUES, ASSISTING THE CONTRACTOR IN DEVELOPMENT OF GRINDING AND POLISHING TECHNIQUES AND TESTING METHODS. EVALUATION OF VISUAL OPTICS AND IVS INTERFACE OPTICAL CHARACTERISTICS. MONITORING FILM AND PROCESSING CAPABILITIES.

MTS

REQUIRED TO PERFORM DETAIL ANALYSES IN SUPPORT OF THESE ACTIVITIES. FOR EXAMPLE: EVALUATE CAPABILITY OF OPTICAL INSTRUMENTATION EMPLOYING A REFERENCE SURFACE WITH A HALF-WAVE RMS SURFACE QUALITY TO MEASURE 1/50 WAVE RMS.

J. S. THOMPSON

STAFF ENGINEER. RESPONSIBLE FOR PERFORMANCE ANALYSIS OF THE CROSS-TIE-FORMAT IMC MECHANIZATION AND SELECTED SPECIAL OPTICAL PROBLEMS, INCLUDING

HANDJE VIA BYEMAN
CONTROL SYSTEM ONLY

~~SECRET~~/DORIAN

~~SECRET~~/DORIAN

EK SEGMENT OFFICE

J. S. THOMPSON
(Cont'd)

FLIGHT ALIGNMENT.

R. S. ROBINS

MANAGER OF THE ELECTRO-OPTICAL SECTION. RESPONSIBLE FOR MANAGEMENT OF ALL AEROSPACE ACTIVITY RELATIVE TO THE ACTIVE ELEMENTS OF THE EASTMAN KODAK PAYLOAD EQUIPMENTS. THIS INCLUDES THE CAMERA, FOCUS SENSOR, ALIGNMENT SYSTEM, VIEWER, PROCESSOR, AND ELECTRICAL ASPECTS OF THE THERMAL CONTROL SYSTEM.

S. MOSKWA

RESPONSIBLE FOR EASTMAN KODAK SEGMENT POWER DISTRIBUTION SYSTEM AND COMMAND SYSTEM, AND INTERFACE.

MTS

RESPONSIBLE FOR AVE SOFTWARE AND OPERATIONS PLANNING FOR EASTMAN KODAK SEGMENT EQUIPMENTS.

MTS

RESPONSIBLE FOR THE PROCESSOR AND VIEWER DEVELOPMENT.

W. KERN

RESPONSIBLE FOR CAMERA AND FILM HANDLING SUBSYSTEMS,

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

~~SECRET~~/DORIAN

~~SECRET~~/DORIAN

EK SEGMENT OFFICE

G. L. HOLTZ

MANAGER OF THE MECHANICAL DESIGN SECTION. RESPONSIBLE FOR MANAGEMENT OF THE EASTMAN KODAK SEGMENT INTERFACE PROGRAM, STRUCTURAL DESIGN, AND THERMAL ANALYSES.

MTS

ENSURE THAT STRUCTURAL DESIGN AND MOUNTING FOR ALL EK SEGMENT HARDWARE MEETS DYNAMICS AND LOAD CRITERIA. INCLUDES CRITERIA DEVELOPMENT, STATIC AND DYNAMIC TEST PLANNING AND MONITORING.

MTS

FULL-TIME ASSIGNMENT IN SUPPORT OF THE ABOVE. THERMAL OPTICAL ANALYSIS, INCLUDING SUCH PROBLEMS AS VALIDATING ULE PRIMARY MIRROR DESIGN BY VERIFYING THAT THERMAL DISTORTION DUE TO DOOR-OPEN OPERATION WILL FALL WITHIN ACCEPTABLE LIMITS AND THAT VENTING OF THE MIRROR HONEYCOMB CELLS IS ADEQUATE TO PREVENT DEFORMATION OR DAMAGE DUE TO ASCENT RATES OF PRESSURE CHANGE.

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

~~SECRET~~/DORIAN

~~SECRET~~/DORIAN

EK SEGMENT OFFICE

R. E. RINGE

MANAGER OF TEST OFFICE. RESPONSIBLE FOR ALL EK
SEGMENT TESTING AT ROCHESTER, HUNTINGTON BEACH
AND VANDENBERG.

F. FEST

RESPONSIBLE FOR ALL EK TESTING AT ROCHESTER AND
FOR ACOUSTIC FACILITY DEVELOPMENT.

R. CHOAT

RESPONSIBLE FOR VANDENBERG TEST DEFINITION AND FOR
SUPPORT OF INTEGRATED TEST DEFINITION INVOLVING
EASTMAN KODAK SEGMENT EQUIPMENTS.

MTS

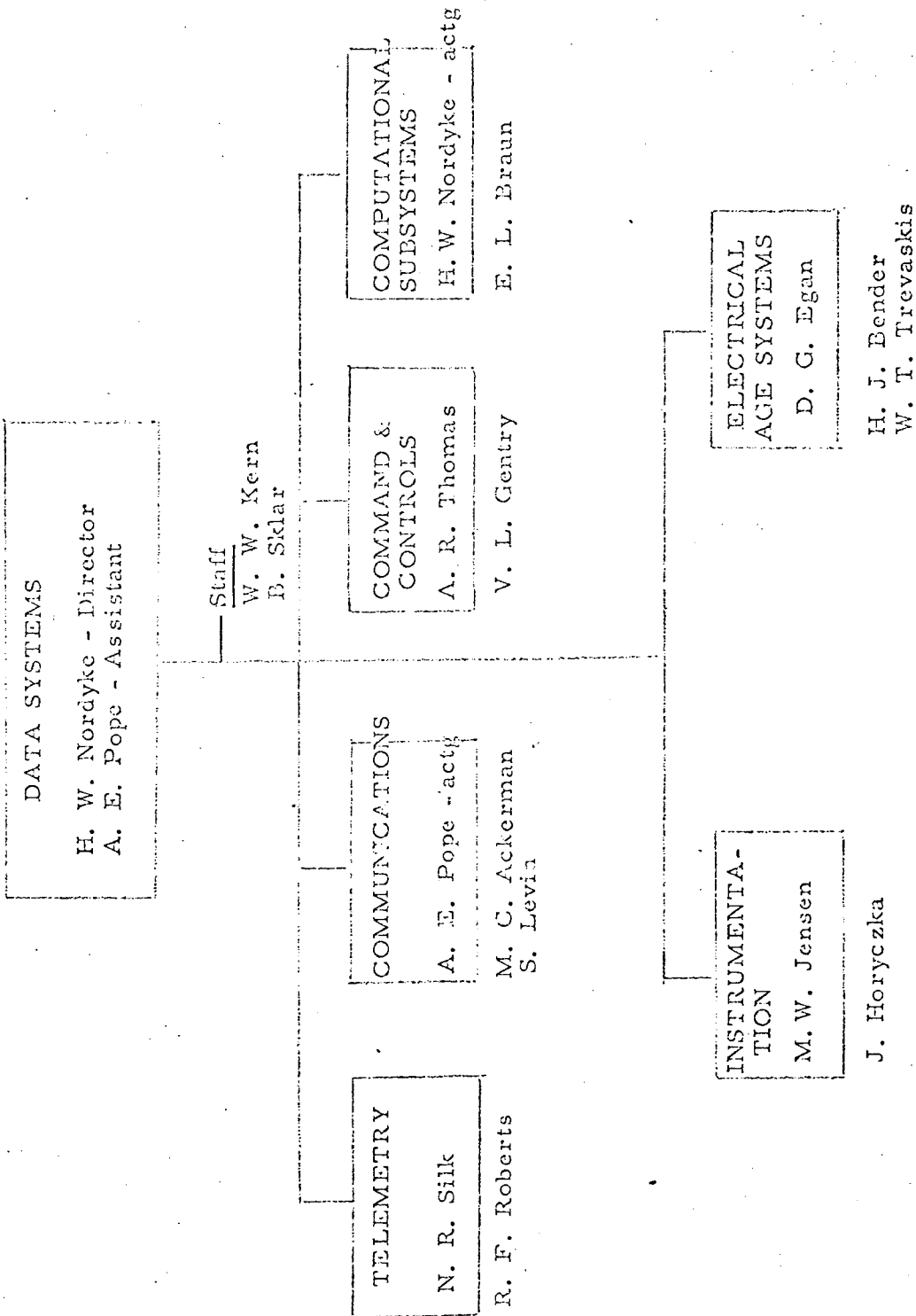
REQUIRED FOR FULL-TIME SUPPORT OF THE EASTMAN
KODAK TESTING AT HUNTINGTON BEACH AND PHILADELPHIA.

E. SCHMIDT

MANAGER OF FACILITIES, AGE AND EXCHANGE HARDWARE.
RESPONSIBLE FOR MANAGEMENT OF ALL AEROSPACE
ACTIVITY INVOLVING ABOVE AT EASTMAN KODAK.

HANDLE VIA BYEMAN
COMINT CONTROL SYSTEM ONLY

~~SECRET~~/DORIAN



19 November 1968

Subject: Responsibilities of Personnel in the Data Systems Office.

The function of the Data Systems Office is to provide GSE/TD through the appropriate segment directors of Electronic and Data Systems Subsystems in the following areas: Telemetry, Communications, Command, On-Board Computers, Instrumentation and Monitor and Alarm, and Electrical AGE.

H. W. Nordyke/A. E. Pope - Director and Assistant Director

Their responsibilities include the general management of the Data Systems Office and, in addition, ensuring that interface compatibility between the subsystems and the various segments is maintained.

B. Sklar - Electronic Integration

Responsible for AVE design integration and circuitry design reviews. Also responsible for special system studies such as in-plant data reduction and integrated circuit performance.

N. R. Silk - Manager Telemetry Subsystem

Responsible for the telemetry subsystems in both GE and DAC program segments. He provides the GSE/TD, manages the working group in TLM and provides the assurance that this subsystem meets the MOL system requirement. Key interfaces are with AVE, Electrical AGE and SCF.

R. F. Roberts - Telemetry Subsystem

Assists N. Silk with the responsibilities outlined above. In addition, he performs system studies showing performance and hardware tradeoffs.

A. R. Thomas - Manager Command Subsystem

Responsible for the Command subsystem in both GE and DAC program segments. He provides the GSE/TD, manages the working groups and provides the assurance that this subsystem will meet the MOL system requirements. Key interface areas are with the AVE, Electrical AGE and SCF.

V. L. Gentry - Command Subsystem

Assists A. Thomas with the responsibilities outlined above. In addition he performs system studies showing performance and hardware tradeoffs.

W. W. Kern - Exchange Hardware and Electronic Test

Responsible for electronic exchange hardware and electronic tests. This includes interface definition and management of all electronic substitutes and tests such as those specified in the Ground Test Plan.

E. L. Braun - On-Board Computer

Responsible for the on-board computer subsystem. He provides the GSE/TD in connection with the acting manager, and provides management of the working group in this area. Key interface areas are with AVE and Electrical AGE and with program software.

M. W. Jensen - Manager Instrumentation, Displays and Monitor and Alarm Subsystems

Responsible for the instrumentation, displays, monitor and alarm subsystems in both DAC and GE program segments. He provides GSE/TD, manages the working group and provides assurance that this subsystem will meet MOL system requirements. Key interfaces are with AVE, Electrical AGE and the SCF.

Responsibilities of Personnel in the Data Systems Office

Page 3

J. Horyczka

Assists M. Jensen with the responsibilities outlined above. In addition, he performs system studies showing performance and hardware tradeoffs.

M. C. Ackerman - AVE Communications Subsystem

Responsible for the AVE communications subsystem in connection with the acting manager. He provides the GSE/TD, manages the working group and provides assurance that this subsystem will meet MOL requirements. Key interface areas are with the AVE and SCF.

S. Levin - Overall Communication Link Intelligibility; Special Purpose Voice Ground Hardware

Responsible for the overall communications link performance, including voice intelligibility and for the special purpose voice ground in connection with the acting manager. He provides the GSE/TD, manages the working group in this area and provides assurance that the voice link intelligibility will meet MOL requirements. The key interface areas are with the AVE and SCF.

D. G. Egan - Manager of Electrical AGE

Responsible for the Electrical AGE in both the GE and DAC program segments. He provides the GSE/TD, manages the working groups and provides the assurance that these equipments will meet the MOL system requirements. Key interface areas are with the AVE and factory test and VAFB.

W. T. Trevaskis -

Assists D. Egan with the responsibilities with Electrical AGE as outlined above. In addition, he performs system studies showing hardware and performance tradeoffs.

H. J. Bender -

Responsible for all Electrical AGE software, both the GE and DAC program segments. This software is necessary to perform all factory test operations, checkout, acceptance and launch functions. In conjunction with the manager of electrical AGE he provides the GSE/TD in software, manages the working group and provides assurance that this area meets MOL system requirements. Key interface areas are with the electrical AGE hardware, AVE, factory test requirements and VAFB launch requirements.

SYSTEMS INTEGRATION

D. R. Howard - Director
R. H. Herndon - Associate

Staff

K. R. Spearman

DESIGN
INTEGRATION

J. Rossoff

J. J. Fastiggi
F. J. Meyer

EFFECTIVE
ANALYSIS

F. P. Kiefer

ELECTRICAL
INTEGRATION

W. J. Baldau

E. Jacobs
W. T. Stafford

SYSTEMS
ANALYSIS

W. C. Englehart

CREW SYSTEMS
INTEGRATION

L. L. Thomas

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ROUGH DRAFT

SYSTEMS INTEGRATION WORK RESPONSIBILITIES

SYSTEM INTEGRATION

D. R. HOWARD - ENGINEERING DIRECTOR IN CHARGE OF THE SYSTEMS
INTEGRATION OFFICE. RESPONSIBLE FOR SEGMENT
INTEGRATION AND SYSTEM LEVEL ANALYSES FOR
SELECTED FUNCTIONAL AREAS.

ELECTRICAL INTEGRATION

W. J. BALDAU - MANAGER OF THE ELECTRICAL INTEGRATION SECTION.
RESPONSIBLE FOR EMC AND ELECTRICAL DESIGN
COMPATIBILITY. CHAIRS EMC BOARD FOR AEROSPACE.

E. JACOBS - RESPONSIBLE FOR EMC ANALYSIS DESIGN AND TESTING
ACTIVITIES. OPR FOR SAFSL 10005 AND 20005.

W. T. STAFFORD - RESPONSIBLE FOR POWER UTILIZATION ALLOCATIONS,
AND NEGOTIATIONS, AND POWER DISTRIBUTION SYSTEM
INTEGRATION, INCLUDING POWER QUALITY ANALYSES
WIRING HARNESS DESIGN, AND BLACK BOX PROTECTION
REQUIREMENTS. CHAIRS POWER COORDINATION BOARD
FOR AEROSPACE. OPR FOR SAFSL 10006 AND 30001.

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SYSTEMS INTEGRATION WORK RESPONSIBILITIES (CONT'D)

MECHANICAL INTEGRATION

J. R. ROSOFF - MANAGER OF MECHANICAL INTEGRATION OFFICE.
RESPONSIBLE FOR WEIGHT ALLOCATION AND
NEGOTIATIONS AND LM MECHANICAL INTERFACE
A ACTIVITIES. CHAIRS WEIGHTS CONTROL BOARD
AND LABS ARRANGEMENTS WORKING GROUP FOR
AEROSPACE.

J. J. FASTIGGI - SUPPORTS J. R. ROSOFF IN LABORATORY
ARRANGEMENTS INTERFACE WORK. COORDINATE
ECP'S FOR OFFICE.

F. MEYER - SUPPORTS J. R. ROSOFF IN WEIGHTS CONTROL
EFFORT. CURRENTLY LIMITED EFFECTIVENESS
DUE TO THE FACT THAT HE HAS ONLY AN SAR
CLEARANCE.

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SYSTEM INTEGRATION WORK RESPONSIBILITIES (CONT'D)

EFFECTIVENESS ANALYSIS

F. P. KIEFER - MANAGER OF THE EFFECTIVENESS INTEGRATION SECTION. RESPONSIBLE FOR INTEGRATION AND TECHNICAL DIRECTION OF CONTRACTOR ANALYTICAL EFFECTIVENESS EFFORTS INCLUDING FAILURE MODE FLCT, AND RELIABILITY NUMERICS. CURRENTLY ALSO, PROVIDING SUPPORT FOR STD DEFINITION AND NEGOTIATIONS AND FOR GROUND CONTAMINATION CONTROL REQUIREMENTS DEFINITION.

T. RUBIN - SUPPORTS F. P. KIEFER IN EFFECTIVENESS ANALYSIS.

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SYSTEM INTEGRATION WORK RESPONSIBILITIES (CONT'D)

SYSTEM ANALYSIS

W. ENGLEHART - MANAGER OF SYSTEM ANALYSIS SECTION.
RESPONSIBLE FOR COMPLETING SYSTEM LEVEL
ANALYSES AND BUDGETING OF POINTING ERRORS,
FORESIGHTING ERRORS AND SMEAR RATE ERRORS
FOR ALL SYSTEM MODE OF OPERATION. PROVIDES
REGULAR ANALYTICAL SUPPORT FOR KEY PROBLEM
AREAS SUCH AS THE CURRENT IVS AND ALIGNMENT
SYSTEM ANALYSES.

ONE MTS - ASSIST W. ENGLEHART IN DIRECTION OF CONTRACTOR
AND IN-HOUSE EFFORTS IN ERROR ANALYSIS.
PROVIDE ADDITIONAL SUPPORT FOR KEY PROBLEMS.

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SYSTEMS INTEGRATION WORK RESPONSIBILITIES (CONT'D)

CREW SYSTEMS INTEGRATION

L. L. THOMAS - MANAGER OF CREW SYSTEM INTEGRATION OFFICE.
RESPONSIBLE FOR HUMAN ENGINEERING ACTIVITIES
FOR MOL. THIS INCLUDES SURVEILLANCES OF ALL
CREW RELATED INTERFACES, ESTABLISHING AND
REVIEWING HUMAN ENGINEERING DESIGN CRITERIA
FOR CREW RELATED SYSTEMS, MONITORING
INTEGRATED CREW TASK ANALYSIS, AND MONITOR-
ING TESTING PROGRAMS INVOLVING THE CREW.

ONE (1) MTS - SUPPORT L. L. THOMAS IN CREW SYSTEM
INTEGRATION

STAFF

K. SPEARMAN - PROVIDES TECHNICAL DIRECTION FOR RADIATION
HAZARD ANALYSIS, TESTING, AND OPERATIONAL
PREDICTION SOFTWARE AND INSTRUMENTATION.
MAINTAINS SYSTEM LEVEL ALLOCATIONS
DOCUMENTATION.

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SYSTEM INTEGRATION WORK RESPONSIBILITIES (CONT'D)

ACTIVITIES NOT COVERED

STD

TWO MTS - BRING SUPER EMILY, EMILY UP-TO-DATE. SUPERVISE CONTRACTOR EFFORTS IN STD. SERVE AS FOCAL POINT FOR IN-HOUSE REVIEW OF CONTRACTOR GENERATED STD.

THERMAL INTEGRATION

TWO MTS - PROVIDE SYSTEM LEVEL ANALYSIS AND MONITOR CONTRACTOR SYSTEM LEVEL TASKS RELATED TO THERMAL ANALYSIS.

CONTAMINATION

TWO MTS - PROVIDE SYSTEM LEVEL REQUIREMENTS, ALLOCATIONS, ANALYSES, AND MONITOR CONTRACTOR SYSTEM LEVEL TASKS RELATED TO MINIMIZATION OF CONTAMINATION OF OPTICAL AND OTHER SENSITIVE EQUIPMENT, BOTH DURING GROUND OPERATIONS AND IN-FLIGHT.

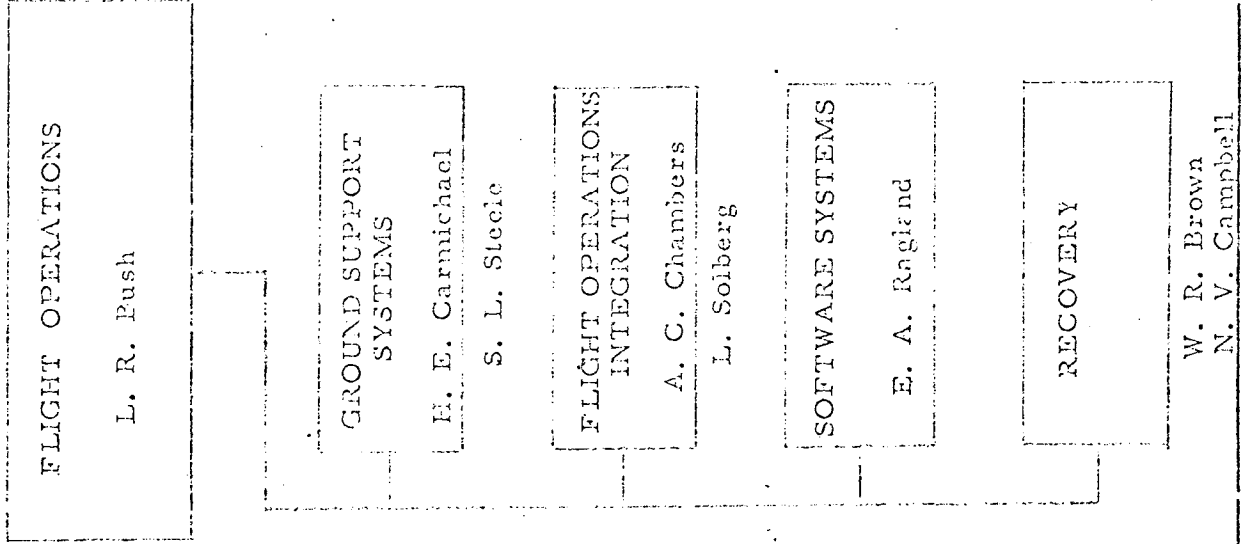
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OPERATIONS DIRECTORATE
W. F. Sampson
F. Bernstein

FLIGHT
OPERATIONS
L. R. Bush

ORBITAL
OPERATIONS
A. D. Hulenbeck

SIMULATION AND
CREW OPERATIONS
M. M. Gibbs



FLIGHT OPERATIONS

L. R. Bush

GROUND SUPPORT
SYSTEMS

H. E. Carmichael

S. L. Stecie

FLIGHT OPERATIONS
INTEGRATION

A. C. Chambers

L. Solberg

SOFTWARE SYSTEMS

E. A. Ragland

RECOVERY

W. R. Brown
N. V. Campbell

FLIGHT OPERATIONS

GROUND SYSTEMS INTERFACE TESTING AND INTEGRATION

- ① MONITOR 3800/ADS DEVELOPMENT AND COORDINATE MOL RELATED INTERFACES
 - PREPARATION OF SAFSL 20012
 - ① FOLLOW CONTRACTOR COMPLIANCE TO SAFSL 20012
 - ① OTEF/SCF INTERFACE INTEGRATION AND TEST
 - ① AFWTR/STC ASCENT INTERFACE, INCLUDING PMR HARDWARE, AFWTR HARDWARE AND SOFTWARE, INSERTION SHIP HARDWARE AND SOFTWARE, AND STC HARDWARE (DATA MODEMS)
- RAGLAND
- CARMICHAEL
AND
STEEL

FLIGHT OPERATIONS

RECOVERY REQUIREMENTS AND OPERATIONS (CAMPBELL & BROWN)

- SUPPORT LAUNCH SITE RECOVERY TRAINING AND OPERATIONS
- DEVELOP RECOVERY REQUIREMENTS AND DEPLOYMENT CONCEPTS
- PLAN AND EVALUATE ALL RECOVERY TESTING

19 November 1968

FLIGHT OPERATIONS OFFICE

TRW POWERED FLIGHT SOFTWARE DEVELOPMENT (CHAMBERS AND SOLBERG)

- () ASCENT MONITORING SOFTWARE
- () REENTRY PROGRAM
- () INTERFACE WITH SYSTEM HC/3800 EXECUTIVE
- () COORDINATE CONTRACTOR INPUTS TO POWERED FLIGHT SOFTWARE
- () DISPLAY DEVELOPMENT AND ADS INTERFACE
- () INSERTION SHIP SOFTWARE REQUIREMENTS
- () CATEGORY I TEST REQUIREMENTS AND PROCEDURES

NOTE: STUDIES TO DATE - TRW NOW ON CONTRACT AND INCREASE IN TECHNICAL DIRECTION REQUIRED

MCC PROCEDURES AND FLIGHT CONTROLLER TRAINING (CHAMBERS)

- * () GUIDE DEVELOPMENT OF TRAINING MATERIALS
- * () DEVELOP PROCEDURE DOCUMENTS FOR MCC ASCENT OPERATIONS
- * () PARTICIPATE IN MISSION RULES DEVELOPMENT

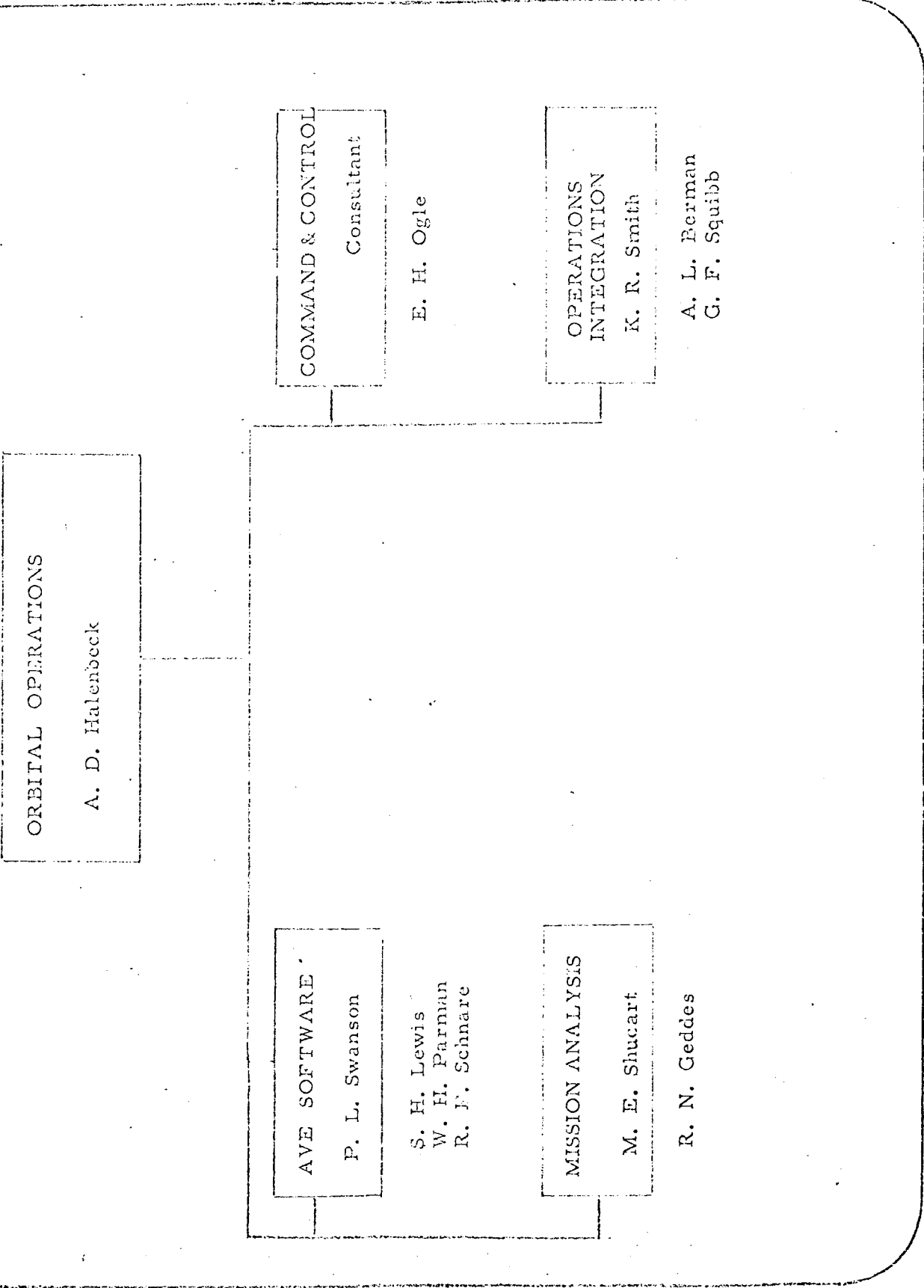
* STAFFING IN PREPARATION FOR THESE ACTIVITIES REQUIRED TO BEGIN IN LATE 1969

FLIGHT OPERATIONS

PROGRAM DOCUMENTATION (CARMICHAEL, STEELE, BROWN, CAMPBELL)

- PREPARE AND PUBLISH THE ORD AND UPDATES
- PREPARE AND PUBLISH THE MRRD, RRD AND GEO/RRD
- * PREPARE AND EDIT THE MISSION RULES HANDBOOK
- PROVIDE ASCENT GROUND SUPPORT INPUTS TO THE PRD
- PROVIDE INPUTS TO THE STO, INTERFACE DOCUMENTS, ETC.

* STARTS IN EARLY CALENDAR YEAR 1969 - ALL DOCUMENTATION
TASKS ON INCREASE



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AVE SOFTWARE SECTION TASKS (SVANSON, SCFNARE, PARMAN AND LEWIS)

- HARDWARE/SOFTWARE INTERFACES
 - EQUATIONS AND LOGIC DEVELOPMENT AND VERIFICATION
 - HW/SW INTERFACE SPECIFICATION REVIEW
 - MALFUNCTION ANALYSES: ERROR DETECTION AND RECOVERY
 - HARDWARE TEST FACILITIES (DSS-1, 114, 115, EDCTU, 118) CAPABILITY EVALUATION
 - / REVIEW OF TEST PLANS AND PROCEDURES (CAT I & II TESTING)
 - / TEST MONITORING AND REVIEW OF TEST RESULTS
- OPERATIONS INTERFACES
 - SIMULATOR CAPABILITY (106 AND LMSE/MMSE) EVALUATION FOR SOFTWARE TESTING
 - / REVIEW OF AVE SOFTWARE TEST PLANS AND PROCEDURES (CAT I & II TESTING)
 - / MONITOR TEST AND REVIEW TEST RESULTS
 - GROUND SOFTWARE/OPERATIONS INTERFACE EVALUATION
 - / C&C S/W, MPE S/W INTERFACE
 - / UPLINK INTERFACE
 - / S/W REQUIREMENTS: AVE HW AND SW DIAGNOSTIC DATA
 - CREW AVE SOFTWARE/OPERATIONS INTERFACE EVALUATION
 - AVE SOFTWARE OPERATIONS EVALUATION
 - / MODE INITIATION/TERMINATION: TIMELINES
 - / BACKUP MODES OF OPERATION: AUTOMATIC SWITCHOVER

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- SUPPORT SOFTWARE AND SOFTWARE INTERFACES
 - EXECUTIVE AND DIAGNOSTIC SOFTWARE EVALUATION
 - REVIEW/APPROVAL OF AVE INTERFACE SPECIFICATIONS
 - REVIEW CORE AND TIMING BUDGETS AND STATUS

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ORBITAL OPERATIONS

GROUND SOFTWARE DEVELOPMENT & IMPLEMENTATION

EVALUATE DESIGN APPROACH & IMPLEMENTATION

- DETAIL REQUIREMENTS DEFINITION
- FLOW CHARTS & EQUATIONS ANALYSIS
- TRADE STUDIES AS REQUIRED
- OPERABILITY & FAILURE RECOVERY
- SIMULATIONS WHERE NECESSARY

DEFINE & WORK INTERFACES

- MOL SOFTWARE
- SCF SOFTWARE

PLAN, MONITOR & REVIEW SOFTWARE TESTS

- VERIFY SYSTEM FUNCTIONS
- VERIFY AND DEVELOP TEST CASES

SYSTEMS INTEGRATION

- OPERATIONAL COMPATIBILITY (CREW, AVE, GROUND)
- TEST COMPATIBILITY (PLANT & VAFB)
- SUPPORT STO, PROCEDURES DEVELOPMENT

SUPPORT OF OPERATIONS

NOTE: THESE EFFORTS APPLY TO ALL SOFTWARE CHARTS FOLLOWING

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○ COMMAND AND CONTROL SOFTWARE*

- PDR'S PARTLY COMPLETE; MANY ACTION ITEMS
- FLIGHT PLANNING BY SOFTWARE (A NEW ITEM)
- COMMAND GENERATION EXPANDED FROM PREVIOUS EXPERIENCE
- TLM PREDICTION AND ANALYSIS - MODULAR
- CREW IMPACT SIGNIFICANT
- MULTITUDINOUS ADS INTERFACES

* NOTE: ONLY ONE CONSULTANT COVERING - NO AEROSPACE PERSONNEL

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ORBITAL OPERATIONS OFFICE

- MISSION SOFTWARE (SHUGART AND GEDDES) (PERKINS)
- UNRESOLVED TECHNICAL DECISIONS REQUIRING STUDY
- BASIC CONFLICTS BETWEEN OPTIMIZATION AND RUN TIME
- MODELS AVE AND CREW

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ORBITAL OPERATIONS OFFICE

(C) ORBIT DATA HANDLING (OGLE)

- TLM MODE INTEGRATION & DESIGN (FIRST CUT PUBLISHED 10/1)
- DISPLAY INTEGRATION & DESIGN (FIRST CUT PUBLISHED 10/1)
- COMMAND DEFINITION SPEC (INCLUDE/GROUND DATA INTERFACE)
- ORBIT DATA HANDLING DEFINITION FOR ORD
- EVALUATE ADS TECH DOCUMENTS & SUPPORT DEVELOPMENT MILESTONES

NOTE (1) ADS REQUIRES DEFINITION OF DATA HANDLING WHICH ESTABLISHES REQUIREMENTS FOR SOFTWARE DEVELOPMENT, HANDLING AND DISPLAYS

(2) FOPG ACTIVITIES INCREASING. ADDITIONAL SUPPORT REQUIRED

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ORBITAL OPERATIONS OFFICE

OPS INTEGRATION

- HANDBOOKS AND PROCEDURES, MISSION RULES DEVELOPMENT (SMITH & SQUIBB)
- FLIGHT VEHICLE TIMELINES (SMITH AND SQUIBB)
- OV GROUND TEST SUPPORT - PROCEDURES/MONITOR/REVIEW (SMITH & SQUIBB)
- ORBIT STUDIES - SELECTION/ORBIT ADJUST CONCEPTS (SIEGEL AND BERMAN)

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OPERATIONS STUDIES (SHUGART AND GEDDES PART TIME)

(C) OPERATIONAL

- TWONDER
- MONTE CARLO (EARLY 1969)
- STR PROTOTYPE
- CLOSED FOR ERROR ANALYSIS

(C) STUDIES IN SUPPORT OF

- ENGINEERING DECISIONS
- OPERATIONS DECISIONS
- SIMULATION & TRAINING
- DEVELOPMENT OF OPERATIONAL TARGET DECK

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SIMULATION AND CREW
OPERATIONS

M. M. Gibbs

Laboratory and
Gemini B Simulators

T. J. Connor

R. C. LaFrance
W. L. Wagoner

Manned Function
Analysis

B. Siegel

R. W. Barczewski
T. A. Hussman

Mission Module
Simulator

E. B. Jones

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SIMULATION & CREW OPERATIONS

- ① SIMULATORS *
 - MDS
 - MMSE
 - LMSE
 - GBPs
 - MISSION SIMULATOR
-
- DESIGN & DEVELOPMENT
 - PLAN CATEGORY I & II TESTING
 - PARTICIPATE IN CATEGORY I & II TESTING
 - PLAN & PARTICIPATE IN INSTALLATION AND ACTIVATION AT OPEF
 - SIMULATOR SEGMENT AND STC INTEGRATION
 - BLOCK CHANGE IMPLEMENTATION
 - SUPPORT OPERATIONS AND TRAINING
-
- ABORT, EGRESS, ZERO C (NEUTRAL BUOYANCY, AIRCRAFT) TRAINERS (DAY)
 - DEVELOP REQUIREMENTS FOR, REVIEW, APPROVE FLIGHT CREW HANDBOOK (DAY)
 - SELECTION OF TECHNICAL REFERENCE MATERIALS FOR VISUAL DISPLAY PROJECTOR

GIBBS
CONNOR
JONES
WAGONER
LA FRANCE
BARCZEWSKI

* NOTE: 90 MILLION DOLLARS COVERING THREE CONTRACTORS

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SIMULATION AND CREW OPERATIONS

① DEVELOPMENT SIMULATOR EXPERIMENTS DEFINITION/DATA ANALYSIS (HUSSMAN)

- PROCEDURES DEFINITION

- QUANTITATIVE DATA

① DEVELOPMENT OF SIMULATION DATA BASE ON MAN'S CONTRIBUTIONS (HUSSMAN)

① SUPPORT PLANNING FOR POST-FLIGHT EVALUATION OF MAN'S CONTRIBUTIONS/
POST-FLIGHT DATA ANALYSIS (PERKINS)

① SUPPORT OF SO IN DEVELOPMENT/REVIEW/COORDINATION OF (DAY)
FLIGHT CREW TRAINING REQUIREMENTS/FLANS/SCHEDULES/
SYSTEMS BRIEFINGS

① SIMULATOR STIMULUS TECHNICAL REQUIREMENTS/SELECTION (D. PIERSON - SUPPORT)

① DEVELOP MISSION SIMULATOR REQUIREMENTS (CONNOR AND JONES)

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PLANNING
LAUNCH OPERATIONS
AND TEST

B. A. HOHMANN

ACCEPTANCE AND
TECHNICAL READINESS

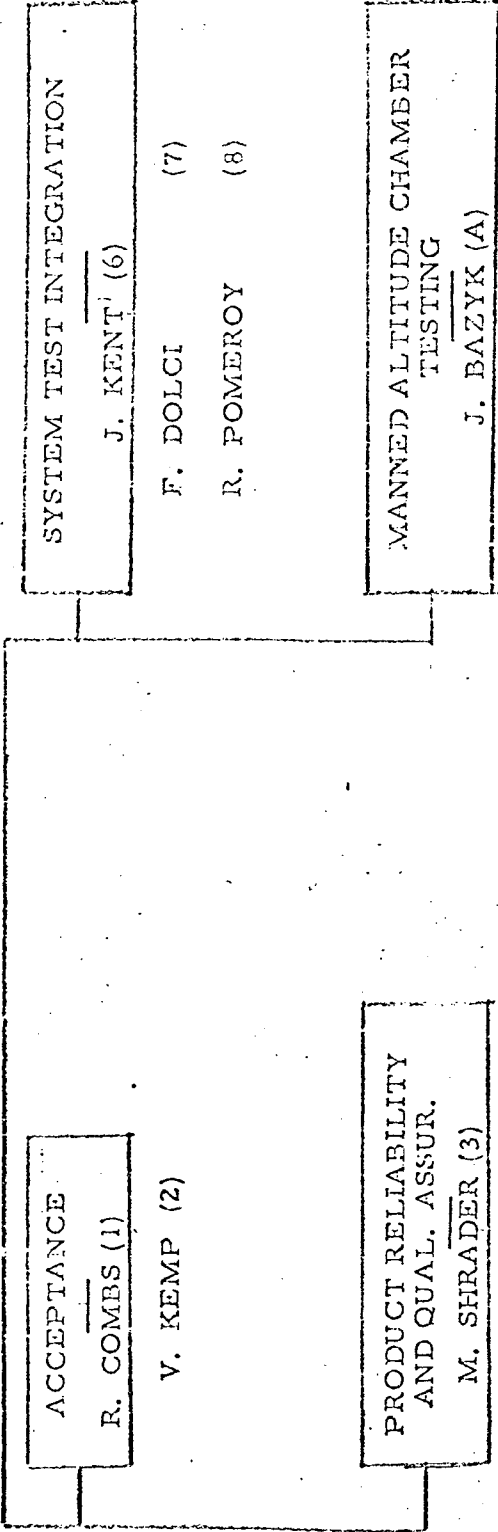
J. F. LAZYK
P. W. RICHARDSON

LAUNCH OPERATIONS

J. F. WAMBOLT



ACCEPTANCE AND
TECHNICAL READINESS
J. BAZYK, DIRECTOR
P. RICHARDSON, ASST. DIRECTOR



NOTE:
(A) ACTING
(1) JOB DESCRIPTION ON ANOTHER CHART

ACCEPTANCE AND TECHNICAL READINESS OFFICE

○ THE ACTIVITIES PLANNED FOR THE ACCEPTANCE AND READINESS OFFICE ARE AS FOLLOWS:

- THE DEVELOPMENT AND IMPLEMENTATION OF MOL ASSEMBLY AND TEST DOCUMENTS OF THE MOL ASSOCIATES AND THE T-11M ASSOCIATES TO PROVIDE CONTINUITY, STANDARDS, AND ASSURANCES OF SYSTEM READINESS FOR MISSION PERFORMANCE AND FLIGHT SAFETY.
- THE MANAGEMENT OF PROGRAM LEVEL ACCEPTANCE AND READINESS OPERATIONS.
- IMPLEMENTATION OF REQUIREMENTS TO ASSURE PRODUCTION INTEGRITY IN AREAS OF QUALITY ASSURANCE, FAILURE ANALYSIS AND CORRECTIVE ACTION, PROBLEM TRACEABILITY AND CONTROLS ASSEMBLY AND TEST TECHNIQUES, SYSTEM AND COMPONENT QUALIFICATION TEST AND INTER-PROGRAM FERTILIZATION.
- DEVELOP AND IMPLEMENT REQUIREMENTS ON SYSTEM QUALIFICATION AND DEVELOPMENT PROGRAMS. MONITOR/MANAGE THESE PROGRAMS FROM A SYSTEMS VIEWPOINT TO ASSURE CONTINUITY AND SYSTEM MISSION INTEGRITY.
- ANALYZE AND MAINTAIN A SYSTEM TEST DOCUMENTATION, REVIEW, EVALUATION AND CONTROL SYSTEM DOCUMENTATION CHANGES; ASSIST IN THE ADJUDICATION OF ACCEPTANCE AND READINESS PROBLEMS.
- DEVELOP AND IMPLEMENT GUIDELINES AND DOCUMENTATION FOR MOL CONTRACTORS FOR MANNED ALTITUDE CHAMBER TESTING.

ROBERT COMBS (1)

- MANAGEMENT OF THE ACCEPTANCE OFFICE EFFORT ASSOCIATED WITH THE ACCEPTANCE OF ALL DELIVERABLE CEPS. THIS INVOLVES THE FOLLOWING TASKS:
 - REVIEW AND EVALUATION OF ACCEPTANCE AND TEST PROGRAMS
 - PARTICIPATION IN FACTORY-TO-PAD TEST FLOW PLANNING
 - ESTABLISH ACCEPTANCE REQUIREMENTS AND PROCEDURES
 - MONITOR THE PROGRESS OF HARDWARE FLOW THROUGH THE ASSEMBLY AND TEST CYCLE
 - COORDINATE THE ACTIVITIES OF THE ACCEPTANCE TEAMS
 - PARTICIPATE AS REQUIRED IN TECHNICAL REVIEW ACTIVITIES, DESIGN REVIEWS, FACI'S, ETC.

VERN KEMP (2)

- CURRENT TASKS
 - PREPARE ACCEPTANCE PLANS
 - PARTICIPATE IN TECHNICAL SIGN-OFF MEETINGS
 - REVIEW ENGINEERING CHANGE PROPOSALS OF MOL CONTRACTORS
 - COORDINATE AND PARTICIPATE AT PLOT REVIEWS OF SOW AND OTHER CONTRACTUAL DOCUMENTS/PROCEDURES
 - REVIEW ADEQUACY OF CDRL ITEMS
 - PARTICIPATE IN PDR AND CDR ACTIVITIES
 - PREPARE TEST FLOWS AND DESIGN SUBSYSTEMS INTERFACE AND POWER UP ACTIVITIES
 - COORDINATE AND PARTICIPATE IN ACCEPTANCE REVIEW ACTIVITIES OF DELIVERABLE ITEMS
 - REVIEW/APPROVE TEST PLANS AND TEST SPECIFICATIONS FOR TECHNICAL ADEQUACY
 - REVIEW ASR
 - PARTICIPATE AT FACI

M. C. SHRADER (3)

- EVALUATE AND DIRECT MOL ASSOCIATE(S) EFFORTS TO ASSURE
HARDWARE RELIABILITY
- CONTRACTOR MANAGEMENT PLANS AND CONTROLS
- EVALUATE AND DIRECT MOL ASSOCIATE(S) QUALITY
ASSURANCE PROGRAM
- ESTABLISH AND MANAGE CLOSED LOOP PROBLEM
REPORTING SYSTEMS
- ESTABLISH AND MAINTAIN A CENTRAL DATA CENTER FOR
MOL PROGRAMS

DAVE FREDENBURG (4)

○ DEVELOP AND IMPLEMENT THE WORKING INTERFACE WITH THE MOL ASSOCIATE CONTRACTORS IN THE AREAS OF PRODUCT RELIABILITY AND QUALITY ASSURANCE ACTIVITIES WHICH INCLUDE:

○ PROBLEM IDENTIFICATION AND CONTROL, CORRECTIVE ACTION AND FOLLOW-UP

○ DETAIL QUALITY PROGRAM REVIEW AND AUDIT

○ RELIABILITY CRITICAL ITEM CONTROLS

○ LIMITED LIFE COMPONENT CONTROLS

○ DESIGN REVIEW SUPPORT

○ FACI SUPPORT AND QUALIFICATION TEST SUPPORT

○ CURRENTLY DEVELOPING THE ESTABLISHMENT OF THE MOL PROBLEM CONTROL CENTER AND INTERFACE OF ACTIVITIES WITH THE APPROPRIATE SEGMENT ENGINEERING AREAS

MURRAY FRIEDMAN (5)

- DEVELOP AND IMPLEMENT THE WORKING INTERFACE WITH THE MOL ASSOCIATE CONTRACTORS IN THE AREAS OF PRODUCT RELIABILITY AND QUALITY ASSURANCE ACTIVITIES WHICH INCLUDE:
 - PROBLEM IDENTIFICATION AND CONTROL, CORRECTIVE ACTION AND FOLLOW-UP
 - DETAIL QUALITY PROGRAM REVIEW AND AUDIT
 - RELIABILITY CRITICAL ITEM CONTROLS
 - LIMITED LIFE COMPONENT CONTROLS
 - DESIGN REVIEW SUPPORT

- PARTICIPATION WITH THE AD HOC COMMITTEE FOR WIRE HARNESS FABRICATION QUALITY REVIEW

J. E. KENT (6).

- MANAGE THE SYSTEM TEST INTEGRATION OFFICE ACTIVITIES AS FOLLOWS
 - ESTABLISH AND MAINTAIN VISIBILITY ACROSS THE SYSTEMS TEST PROGRAM AND PROVIDE A MECHANISM FOR RESOLVING PROBLEMS ASSOCIATED PRIMARILY WITH TWO OR MORE CONTRACTORS
 - ENSURE THE ESTABLISHMENT OF A TECHNICAL TEST BASELINE FOR INTEGRATED TESTING AND ASSIST IN ESTABLISHING PROGRAM OFFICE CONTROLS AND TECHNIQUES OF MANAGEMENT FOR INTEGRATED TEST OPERATIONS
- ACCOMPLISHMENT OF ASSIGNED TASKS THROUGH IN-HOUSE AND MOL CONTRACTOR MEETINGS

F. J. DOLCI (7)

PROVIDE PROGRAM OFFICE SYSTEM ENGINEERING IN ELECTRICAL AVE AND AGE
AREAS OF THE MOL SYSTEM TEST INTEGRATION EFFORT

AREAS OF PARTICULAR CONCERN ARE THE VARIOUS INTERFACES OF COMMAND,
CONTROLS, INSTRUMENTATION AND POWER, AND THE CITE-ASTEG/AVE
INTERFACES

J. F. BAZYK 8 NOV 68

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R. POMEROY (8)

- PERFORM EVALUATION OF CONTRACTOR PROPOSALS AND PLANS WITH EMPHASIS PLACED ON MECHANICAL, STRUCTURAL, HYDRAULIC AND PNEUMATIC SUBSYSTEMS AND SYSTEM TESTING
- IDENTIFY AND EVALUATE COMPATIBILITY OF INTEGRATION TESTING BETWEEN VEHICLE SEGMENTS, AND AVE/AGE

A. A. JACOBS (9)

- IN ACCEPTANCE ACTIVITY PERFORMING COORDINATION OF PLANS, HARDWARE/
SOFTGOODS ACCEPTANCE FOR GEMINI B, PRESSURE SUIT ASSEMBLY AND
- PDR/CDR/PROGRAM REVIEW ACTIVITIES FOR GEMINI B AND PRESSURE SUIT
ASSEMBLY
- MANNED ALTITUDE CHAMBER TESTING
- WROTE MOL MANAGEMENT INSTRUCTION TOR FOR MANNED CHAMBER
TESTING
- COORDINATING DOCUMENT WITH AIR FORCE/AEROSPACE AND MOL
CONTRACTORS
- SUPPORTING SAFETY REVIEW ACTIVITIES FOR ALTITUDE CHAMBER
TESTING READINESS ACTIVITIES AND FACILITY REVIEWS
- CONDUCT ECP REVIEWS OF GEMINI B, PRESSURE SUIT ASSEMBLY, AND
SPACE SIMULATION FACILITIES AND MANNED TESTS

LAUNCH OPERATIONS
J. F. Wambole

Launch Operations, Planning & Support
Provide and improve, for the elements of Launch Operations, the policies, requirements, operating plans, schedules, techniques and disciplines necessary to evaluate the state of operational readiness and flexibility of the integrated MOL launch system.

R. B. Fling

J. R. Carroll

A. C. Kurz

H. C. Yim

Launch Systems Integration
Plan, review, analyze and evaluate as necessary the activation, integration and operational readiness of ground and airborne equipment and systems at VAFB necessary in the support of a MOL launch.

I. Kurman

B. P. Bayer

D. Smith

VAFB Operations
Provide a continuous technical effort at the launch site to monitor, evaluate, analyze, improve and report all significant launch operations activities and methods at VAFB as an extension of the Aerospace/LA Launch Operations Program Office and in support of the 6595th ATW.

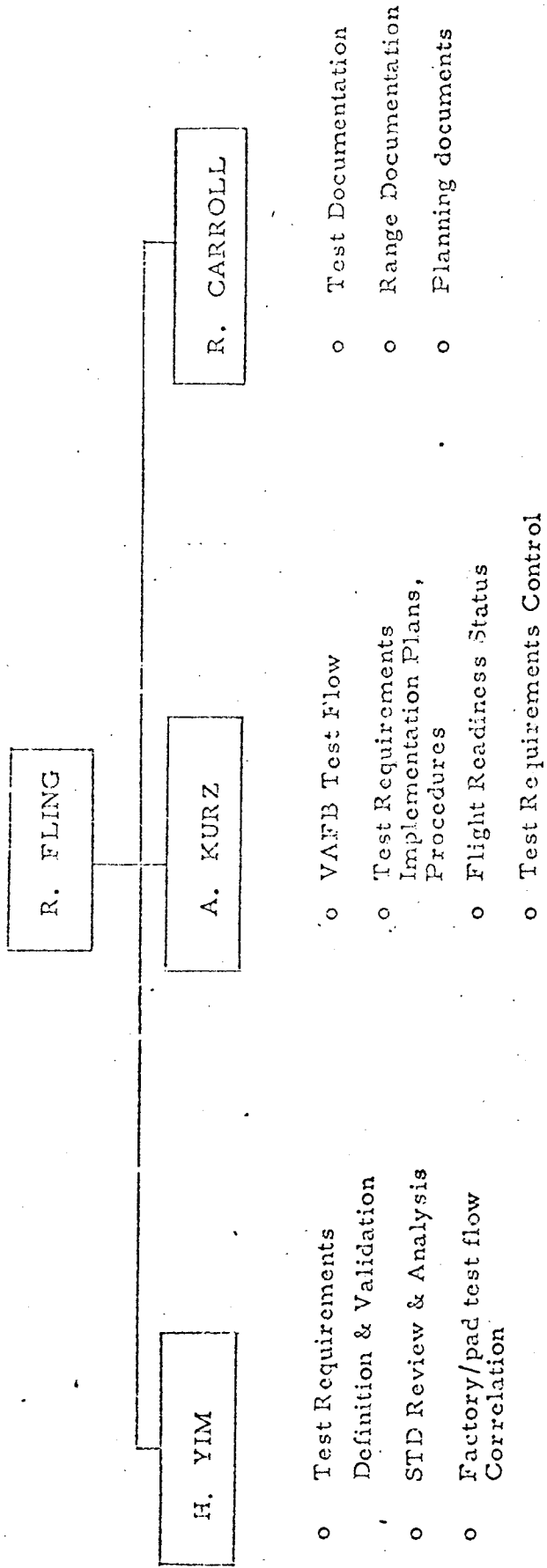
F. M. Anderson

M. C. Berker

E. B. Davis

At Present

LAUNCH OPERATIONS, PLANNING AND SUPPORT



MANAGER - Launch Operations, Planning and Support

Function is to provide the policies, requirements, operating plans and disciplines necessary to produce an integrated MOL launch system.

- o Provide in-house coordination of Launch Operations plans and policies and resolution of problems through the Launch Operations Planning Group
 - Serve as technical co-chairman
- o Establish MOL launch operations documentation program to insure proper development and implementation of requirements, plans and procedures
- o Establish and maintain a link with factory testing
- o Participate in the flight readiness of the MOL Flight Vehicle
- o Provide a contact within Launch Operations for VAFB testing and operations
- o Focal points in Launch Operations, LA, for malfunctions/problems occurring during flight hardware testing.
- o Provide support studies and analyses through the technical staff in the areas of test definition, constraints, safety or re-cycle
- o Serve as team captain for launch operations statements of work reviews and related fact-finding and negotiations.

1. Technical Chairman of the Launch Operations Flow Subgroup
(LOFS) This Working Group was formed by direction of the LOPG to work the test flow areas and is comprised of representatives from Air Force, Aerospace, and all FV Associate Contractors.
2. Maintain a continuous analysis of all test requirements to insure operational compatibility between systems and between segments (includes AVE, AGE, Facilities, Range, and Software).
3. Review and monitor segment checkout requirements via the Segment CRP's and FV checkout requirements via the FVCOP to:
 - a. Assure implementation of test requirements
 - b. Integrate operational requirements in the interface areas between the segments, between the FV and the AGE, and between the FV and the Range.
 - c. Provide operational constraints.
 - d. Verify compliance with SAFSLs 20020 (STOP), 20021 (GGTP), and 20023 (VAFB LO & CSR).
 - e. Maintain the test flow and supporting timelines.
4. Conduct an analysis of all changes (airborne and ground) for impact on operations and testing.
5. Monitor the testing of the vehicles at VAFB to verify status and readiness.
6. Monitor and review test specifications for the FV and FV Segments to assure compliance with test requirements and implementation via test procedures. Also, maintain technical control of the test specifications.
7. Support the day-to-day type problems and provide inputs for test requirements and operational requirements as well as assisting in the resolution of these problems.
8. Participate in acceptance activities to the extent necessary to provide continuity between Acceptance and Readiness.

Activities devoted to achieving maximum continuity and compatibility of factory acceptance and launch site test of MOL elements.

○ TEST REQUIREMENTS

- Investigating adequacy of documentation coverage
- Commonality of contractor's approach
- Review of technical requirements (Future Effort)

○ TEST FLOW

- Establish factory acceptance through launch baseline test flow for test planning
- Utilization of STD Block 8.0 and 7.0
- Perform system integration of test problem

○ TEST PLANS

- Review and coordinate test plans applicable to factory acceptance and launch site testing.

Acceptance Test Plans
Integrated Test Plans
Checkout Requirements Plans
Flight Vehicle Checkout Plan

Much of my activities are devoted to achieving maximum compatibility between factory acceptance and launch site test planning for the MOL Program elements. In addition, I devoted substantial effort in optimizing the commonality of approach in test planning among the MOL Associate Contractors. Specific assignments in support of the above objectives include the following:

1. Test Requirements for MOL
 - a) Currently investigating the adequacy of System Test Documentation from the CEI Spec Part II down to the Test Procedures (including contractor in-house documents) to identify requirements holidays in the test documentation area. Specific areas of interest are the level of technical detail appropriate for the various test requirements documents identified.
 - b) Subsequent to the issue of test requirements documents each document shall be reviewed for technical adequacy and completeness and problem areas coordinated with the segment OPR's. Their respective associate contractors.
2. Factory Acceptance to Launch Site Test Continuity and Compatibility
 - a) Established the requirement for the MOL Associate Contractors to use the System Technical Documentation (STD) to validate the continuity and compatibility between factory acceptance and launch site testing. Established a STD requirement for a total factory acceptance through launch test flow which will be the basis for the preparation of Block 7.0 and 8.0 STD. The STD will be a means for implementing test matrices to analyze the adequacy of the MOL factory through launch test program
 - b) Throughout the acquisition phase of the program, the continuity and compatibility of factory acceptance and launch site testing will be optimized to the greatest extent possible using specifications, plans, and STD. Test flow matrices by all MOL Subsystems will be used for System Integration purposes throughout the acquisition phase of the program.
3. Test Plans

Support the review and coordination of test plans applicable to factory acceptance and launch site testing. Documents in this area prepared by the MOL Associate Contractors include:

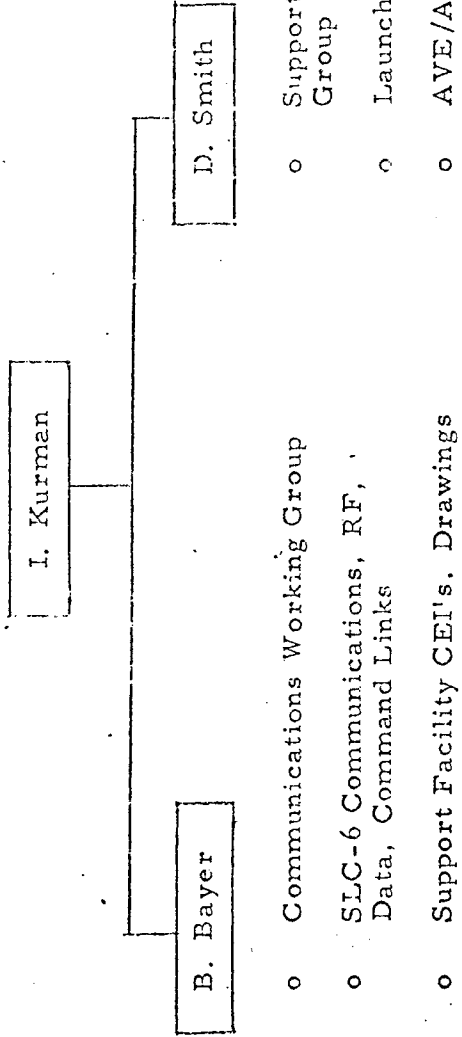
Acceptance Test Plans	Checkout Requirements Plan
Integrated Test Plans	Flight Vehicle Checkout Plan

- Project Engineer with Prime Responsibility for Preparation Total MOL PRD
 - a) Overall management/coordination of contractor inputs
 - b) Detailed technical review of all contractor's inputs
 - c) Integration and documentation of total program Range Support requirements
 - d) Continuous function requiring update as program progresses in consonance with contractor/Range requirements and capabilities

- Project Engineer Responsible for Coordination, Integration and Documentation of Development Fits 1 and 2 Pre-Flight & Flight
 - a) Serves as authoritative detailed pre-flight and flight plans and requirements guide
 - b) Serves to expose planning areas that are problematical, controversial or neglected
 - c) Continuous function that will be updated with planning changes and phase into the directoral STO documentation activities for program

- GENERAL - Member of MOL Team responsible for developing and defining major test requirements, test flow, test support and documentation requirements.
 - a) Requires participation in meetings
 - b) Review of contract or inputs pertinent thereto
 - c) Provide written inputs in support of task

LAUNCH SYSTEMS INTEGRATION



Responsibilities of I. Kurman

Manager of the Launch Systems Integration Section of the Launch Operations Group. The functions and responsibilities of this section include the planning, analysis and evaluation of the activation, integration and operational readiness of the ground and airborne systems at the MOL Launch Facilities. Specific responsibilities include:

- 1) Technical Co-Chairman of the SLC-6 Activation Working Group for the MOL Office.
- 2) Member of the MOL Support Facilities Activation Working Group.
- 3) Review and analysis of ICNP's, FCR's and ECP's for effect on integrated hardware at VAFB.
- 4) Act as the PLOT single-point contact for configuration management in the review and coordination of all change paper.
- 5) Participate in AVE/AGE/Facility interface definition and maintenance.
- 6) Review AVE/AGE designs and participate in PDR/CDR activity to insure operations requirements for compatibility, checkout flexibility and safety are met.
- 7) Review contractor plans and statements of work for compliance with activation and operation requirements.
- 8) Preparation and maintenance of SAFSL Exhibit 20011 (Activation Requirements).

Responsibilities for B. Bayer

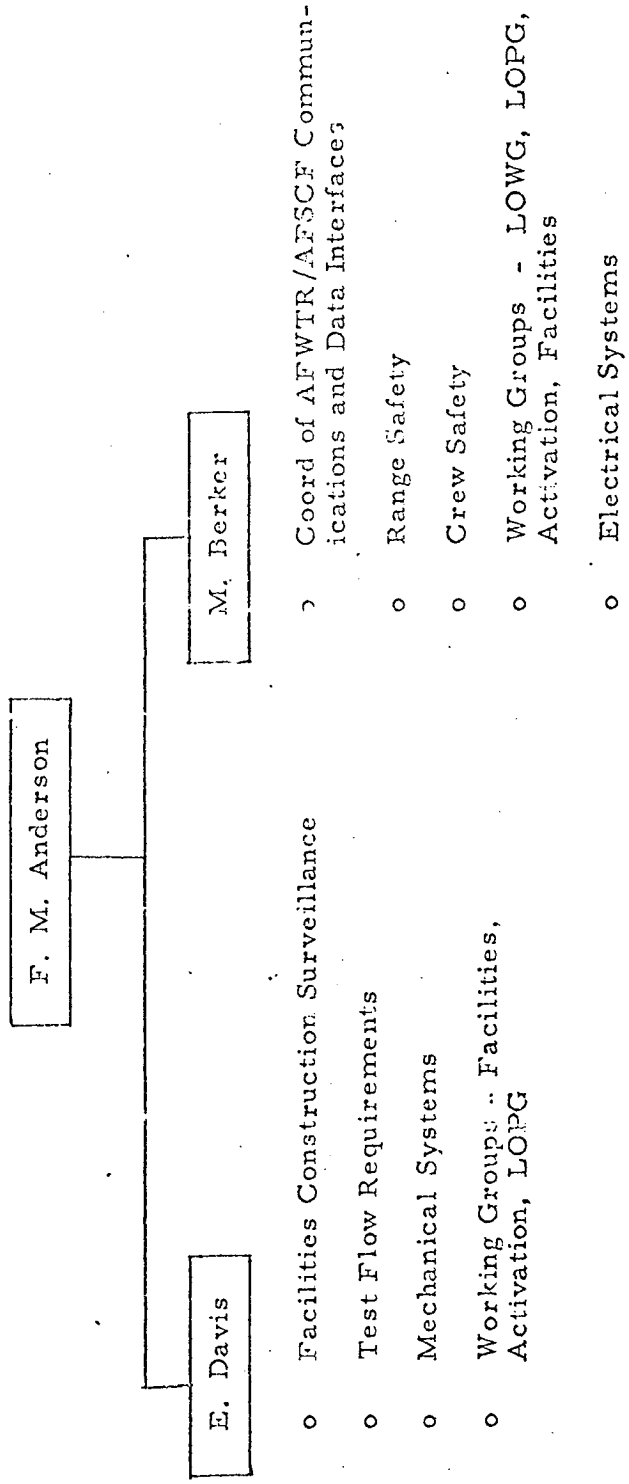
- 1) Responsible for all MOL ground communications at VAFB. Coordinated all inputs to MOL Communications ^{PLAN 4 CO-CHAIRMAN OF THE GHD COMM.} Sub Working Group.
- 2) Provides Systems Engineering and Technical Direction on MOL Radio Frequency Transmission System at SLC-6. Included ^S all coordination with WTR, all MOL offices and MOL Associate Contractors and sign-off of IFS/ICD documents.
- 3) Responsible for review and MOL coordination of all MOL support facility FCEI's and architect and engineer drawings and specifications.
- 4) Responsible for providing information and review of all portions of PRD relating to communications and/or facility requirements.
- 5) Responsible for review of all ascent communications, tracking and telemetry documentation to provide smooth transition from pre-launch and early flight equivalent data transfer.
- 6) Responsible for SAFSL Exhibits 10025, MOL Facilities and 20025, MOL Logistics.

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Responsibilities of D. Smith

- 1) Review and analyze ICNP's, FCR's and ECP's for effect on integrated hardware at VAFB.
- 2) Act as the Launch Operations Safety Representative for all safety activity at VAFB.
- 3) Review AVE/AGE designs and participate in PDR/CDR activity to insure operations requirements for compatibility, checkout, flexibility and safety are met.
- 4) Participate in the development of test requirements, plans, and procedures.
- 5) Technical Co-Chairman of the MOL Support Facility Activation Working Group.

VAFB SUPPORT



F. M. Anderson, Manager

Provide liaison and coordination between MOL Test Operations and the 6595th ATW and AFWTR.

Assigned duties which include member of Launch Operations Planning Group, Member of the Launch Operations Flow Subgroup of the LOPG, Member of the Executive Council of the Activation Working Group, Member of the Facilities Working Group. All the above groups meet approximately every four to six weeks with the exception of the Facilities Working Group which meets weekly at Vandenberg.

Primary areas of emphasis during the next two years will include construction surveillance and activation of SLC-6 and MOL support facilities at Vandenberg and continued further detailed definition of test operations to be accomplished at Vandenberg. This should include review and comment on contractor segment checkout requirement plans, integrated vehicle operations plans, preliminary countdown manual and outline of integrated flight vehicle test procedures.

E. B. Davis

- o Facilities construction surveillance.
- o Represent MOL Aerospace SLC-6 Facilities Working Group.
- o MOL Support Facilities Working Group.
- o Member of the Activation Working Groups.
- o Factfinding on launch support contracts.
- o Participate in CDR's for mechanical operations.
- o Technical support of the 6595th ATW as required.
- o Participate in the activities of the LOFS and LOPG at LA.

M. C. Berker

- o Coordination of MOL/AFWTR/AFSCF Communication (data and voice) interfaces and policies.
- o Coordination with AFWTR on matters concerning range safety (i. e. , program policy, man safety, interrelationship, AVE configuration, and trajectories, etc.).
- o Participation in the activities of various working groups - LOWG, LOPG, LOFS, SLC-6 SWG, MSF SWG, EMC test, etc.
- o Participation in CDR's for electrical operations.
- o Review of pertinent AGE/AVE ECP's.
- o Coordination of PRD with Range.

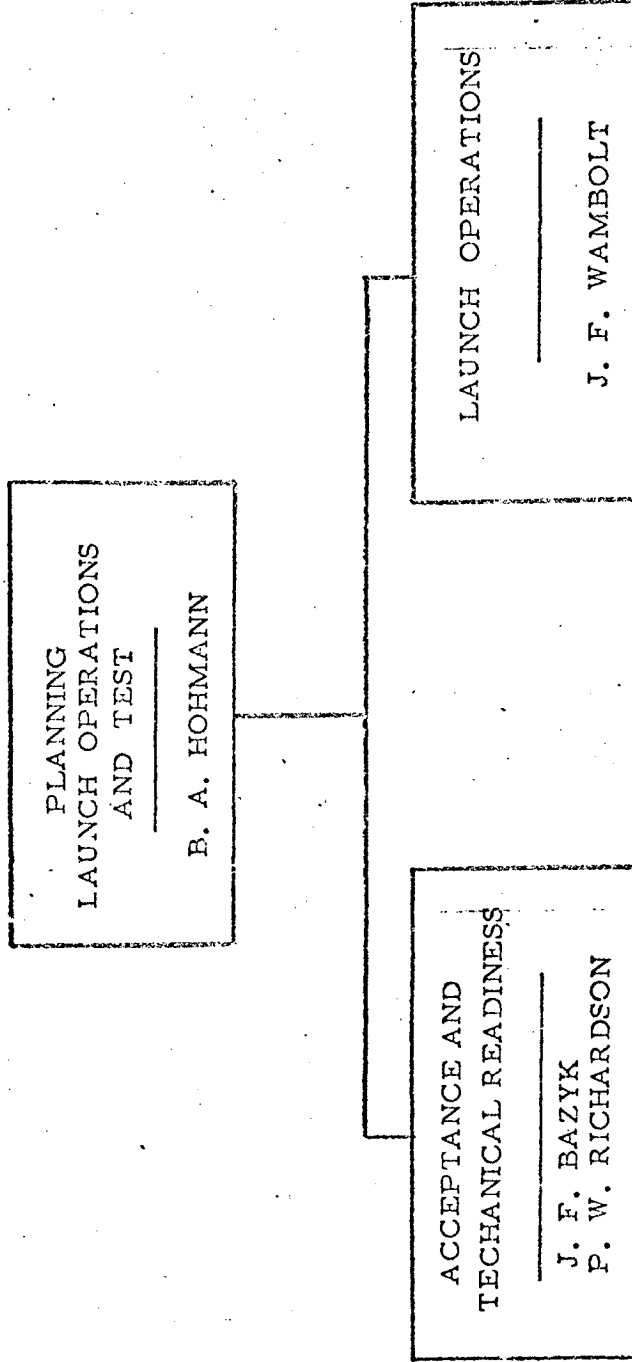
Shuman D

CHARTS ASSOCIATED WITH PLOT DIRECTORATE

4 YEAR STAFFING MEMO - DATED 15 OCTOBER 1968

- TASKS/AREAS REQUIRING AEROSPACE PARTICIPATION
- TASKS/AREAS THAT CANNOT BE WORKED UNLESS STAFFING PLAN IS APPROVED

11 NOVEMBER 1968



PLOT LEAD RESPONSIBILITIES

DEFINE THROUGH PLANNING, THE POLICIES, RESPONSIBILITIES, CONTROLS AND TECHNICAL APPROACH TO BE USED BY ALL MOL PARTICIPANTS IN THE CONDUCT OF THE FOLLOWING

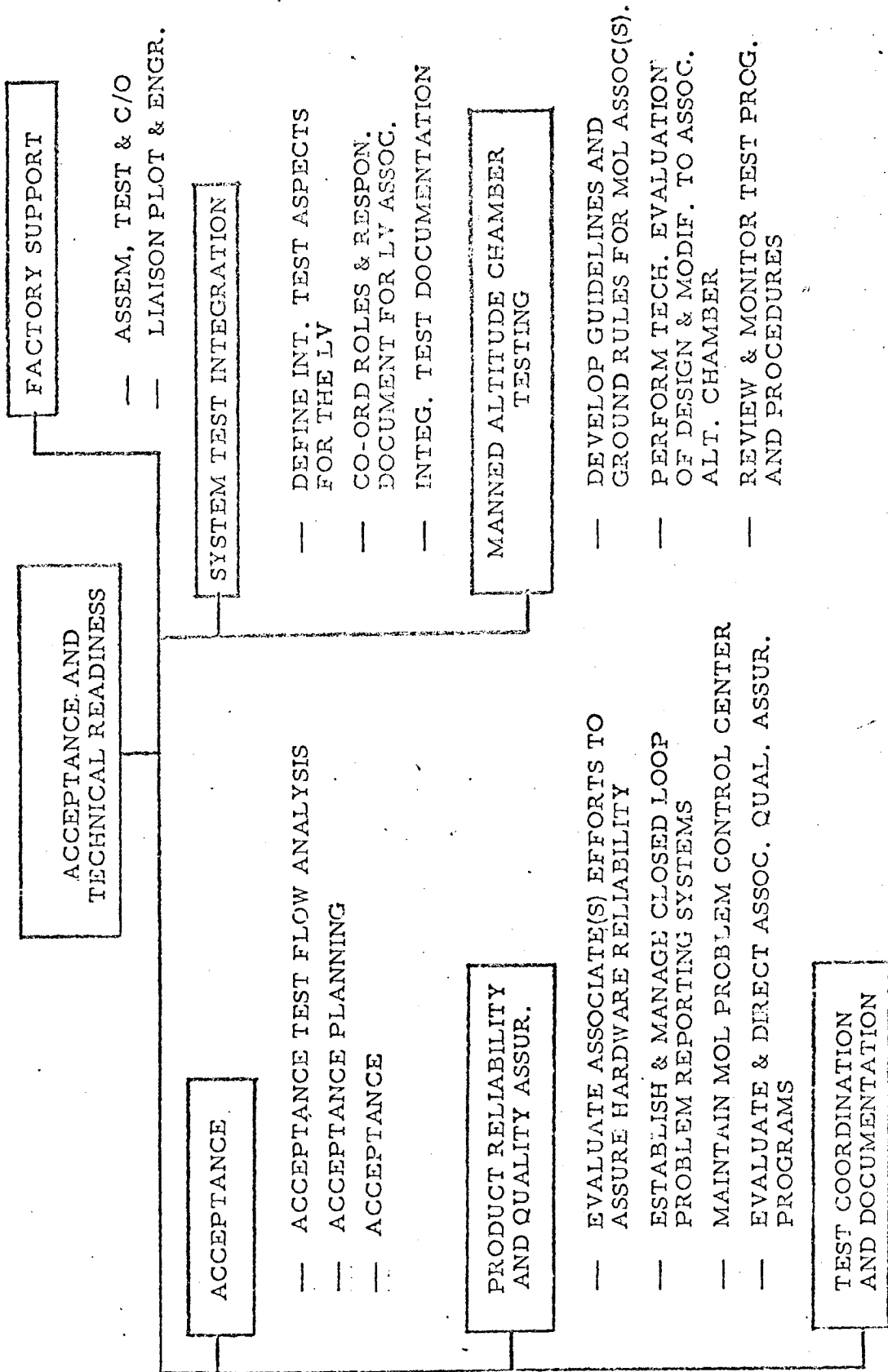
AREAS:

- o SYSTEM ACCEPTANCE TEST MANAGEMENT
- o TECHNICAL ACCEPTANCE OF MOL AVE
- o LAUNCH OPERATIONS OF THE MOL FLIGHT VEHICLE
- o PRODUCT RELIABILITY - QUALITY ASSURANCE
- o TEST SAFETY
- o FLIGHT READINESS DETERMINATION

MANAGE THE AEROSPACE EFFORT ASSOCIATED WITH THE ABOVE AREAS TO THE EXTENT NECESSARY TO PROVIDE THE AIR FORCE WITH A CONTINUOUS TECHNICAL APPRAISAL OF THE PARTICIPATING CONTRACTOR'S RESPECTIVE PERFORMANCE AND FORMULATE RECOMMENDATIONS AS APPROPRIATE TO FULFILL THE ROLE OF GSE/TD

PLOT SUPPORT RESPONSIBILITIES

PARTICIPATE TO THE DEGREE NECESSARY AND AS REQUESTED TO SUPPORT THE FULFILLMENT OF THE LEAD RESPONSIBILITIES OF ENGINEERING AND OPERATIONS TO INSURE MUTUAL COMPATIBILITY AND CONSISTENCY OF REQUIREMENTS



ACCEPTANCE OFFICE TASKS

- ACCEPTANCE TEST FLOW ANALYSIS
 - EVALUATE ACCEPTANCE TEST FLOWS TO EXTENT NECESSARY TO ESTABLISH SIGNIFICANT ACCEPTANCE REVIEW MILESTONES
 - EVALUATE TEST REQUIREMENTS ESTABLISHED BY BLOCK 8.0 STD
 - REVIEW FACTORY ASSEMBLY AND ACCEPTANCE TEST FLOWS FOR COMPATIBILITY AND OPTIMIZATION WITH LAUNCH OPERATIONS PLANNING - ASSURE COMPATIBILITY OF FACTORY AND PAD TEST FLOWS
 - ASSURE INTEGRATION OF AGE AND FACILITIES WITH TEST FLOWS TO OPTIMIZE TIME AND CHECKOUT REQUIREMENTS
- ACCEPTANCE PLANNING
 - PREPARE, COORDINATE AND PUBLISH AN "ACCEPTANCE PLAN" FOR EACH ASSOCIATE CONTRACTOR
 - PLAN AND COORDINATE THE ACCEPTANCE ACTIVITIES FOR ALL FLIGHT/PRIME HARDWARE
 - PLAN AND COORDINATE, AS REQUIRED, THE ACCEPTANCE ACTIVITIES FOR ALL OTHER ITEMS OF EXCHANGE HARDWARE
- ACCEPTANCE
 - PARTICIPATE IN ACCEPTANCE REVIEWS
 - FORMULATE CORPORATE POSITION ON ACCEPTABILITY
 - PUBLISH FINAL REPORT DOCUMENTING ACCEPTANCE ACTIVITIES
 - MAINTAIN SURVEILLANCE OF HARDWARE DURING SUBSEQUENT TESTING ACTIVITIES FOR POSSIBLE IMPACTS ON FUTURE ACCEPTANCE EFFORTS

NOTE

TASK WILL BE LIMITED TO GEMINI B AND LV AT HUNTINGTON BEACH ONLY

PRODUCT RELIABILITY AND QUALITY ASSURANCE

- EVALUATE AND DIRECT MOL ASSOCIATE(S) EFFORTS TO ASSURE
HARDWARE RELIABILITY
- ① CONTRACTOR MANAGEMENT PLANS AND CONTROLS
- ① EVALUATE AND DIRECT MOL ASSOCIATE(S) QUALITY
ASSURANCE PROGRAM
- ① ESTABLISH AND MANAGE CLOSED LOOP PROBLEM
REPORTING SYSTEMS
- ① ESTABLISH AND MAINTAIN A CENTRAL DATA CENTER FOR
MOL PROGRAMS *Call for info by 3/15/69 10032*

NOTE

- ① EXISTING OFFICE STAFF CANNOT DO TOTAL TASK
- SELECT TWO ASSOCIATES AND DO ALL TASKS
- OR
- PERFORM A SURVEILLANCE EFFORT WITH ALL ASSOCIATES

SYSTEM TEST INTEGRATION

○ DEFINE AND COORDINATE INTEGRATED TEST REQUIREMENTS OF LAB VEHICLE SYSTEM LEVEL TESTING: THROUGH DEVELOPMENT, QUALIFICATION AND ACCEPTANCE TESTING AT THE SYSTEM, MODULE AND VEHICLE LEVEL

○ MAINTAIN SURVEILLANCE AND UNDERSTANDING OF THE LV SYSTEM TEST FLOW AND EXCHANGE HARDWARE SCHEDULES AND REVIEW EVERY PROPOSED CHANGE FOR SYSTEM COMPATIBILITY

○ REVIEW AND APPROVE INTERFACE SUBSTITUTE REQUIREMENT (EXCHANGE HARDWARE) FOR ADEQUACY IN SATISFACTION OF SYSTEM TEST OBJECTIVES

○ REVIEW DEVELOPMENT AND QUALIFICATION TEST PLANS FOR BACKGROUND TO VALIDATE ACCEPTANCE TEST PLANS FOR ADEQUACY OF INTEGRATED SYSTEM

○ INTERPRET TEST OPERATIONAL REQUIREMENTS TO SOFTWARE DESIGN AND INTEGRATION

○ INSURE MAXIMUM TRACEABILITY OF CRITICAL SYSTEM PERFORMANCE DATA THROUGHOUT THE TEST CYCLE, FROM DEVELOPMENT AND MANUFACTURE TO LAUNCH

NOTE:

○ TASK PERFORMED ON SELECTED ITEMS ONLY

SYSTEM TEST INTEGRATION (CONTINUED)

- PROVIDE PROGRAM OFFICE SURVEILLANCE OF ALL FORMAL INTEGRATED TEST ACTIVITIES IN THE LV SYSTEM TEST FLOW
- DIRECTLY SUPPORT THE SYSTEMS TEST PLANNING GROUP AND ITS RELATED WORKING GROUPS
- COORDINATE CLOSELY WITH THE LAUNCH OPERATIONS ACTIVITIES TO INSURE THAT LV SYSTEMS INTEGRATION IS MAINTAINED THROUGH LAUNCH

MANNED ALTITUDE CHAMBER TESTING

- DEVELOP GUIDELINES AND GROUND RULE INSTRUCTIONS FOR MOL ASSOCIATES
- PERFORM TECHNICAL EVALUATION OF DESIGN AND MODIFICATIONS TO CONTRACTOR(S) ALTITUDE CHAMBERS FOR MANNED TESTING
- REVIEW AND MONITOR ALTITUDE CHAMBER TEST PROGRAM(S) FOR MANNED TESTING
- COORDINATE FOR SATISFACTORY RESOLUTION THE PROBLEMS RELATED TO ALTITUDE CHAMBER PERFORMANCE
- SUPPORT MOL SO/AEROSPACE MANAGEMENT REVIEW TEAMS TO DETERMINE CONTRACTOR(S) READINESS FOR MANNED ALTITUDE CHAMBER TESTING
- COORDINATE ALTITUDE CHAMBER TEST PROGRAMS FOR PRESSURE SUIT REQUIREMENTS

(C)

(C)

FACTORY SUPPORT

- FACTORY LIAISON TO SUPPORT OPERATIONS ACTIVITIES AND ENGINEERING AS REQUIRED
- CONTINUOUS SURVEILLANCE OF FACTORY ASSEMBLY AND TEST
- COVERAGE OF FACTORY FAILURE ANALYSIS AND CORRECTIVE ACTION EFFORTS
- COORDINATE WITH AFPRO ON ECFS
- MEDIATE ASSOCIATE CONTRACTOR DIFFERENCES OF OPINION DURING TEST ACTIVITIES.

TEST COORDINATION AND DOCUMENTATION

○ OUTLINE OF ALL TEST DOCUMENTATION REQUIREMENTS FOR
MOL SO AND ITS CONTRACTORS TO ASSURE SYSTEM COMPATIBILITY

○ PREPARATION AND COORDINATION

— INTERNAL AF/A OFFICES

— MOL CONTRACTORS

○ EFFECT CONTINUITY OF TEST REQUIREMENTS FOR A TOTAL
SYSTEM APPROACH

W. J. ...
...

LAUNCH OPERATIONS

Launch Operations, Planning & Support

Provide and improve, for the elements of Launch Operations, the policies, requirements, operating plans, schedules, techniques and disciplines necessary to evaluate the state of operational readiness and flexibility of the integrated MOL launch system.

Launch Systems Integration

Plan, review, analyze and evaluate as necessary the activation, integration and operational readiness of ground and airborne equipment and systems at VAFB necessary in the support of a MOL launch.

VAFB Operations

Provide a continuous technical effort at the launch site to monitor, evaluate, analyze, improve and report all significant launch operations activities and methods at VAFB as an extension of the Aerospace/LA Launch Operations Program Office and in support of the 6595th ATW.

LAUNCH OPERATIONS STAFFING

- APPROACH
- MAINTAIN A SMALL PLANNING AND SUPPORT ORGANIZATION
AT LA - 8.0 MTS BY END OF FY70
- MAINTAIN A SMALL LAUNCH SYSTEMS INTEGRATION ORGANIZATION
AT LA - 7.0 MTS BY END OF FY70
- ESTABLISH A DETAILED SYSTEM ENGINEERING CAPABILITY AT
VAFB REACHING FULL STRENGTH IN FY71 - 48 MTS

LAUNCH OPERATIONS PLANNING

- ESTABLISH AND MAINTAIN LAUNCH OPERATIONS DOCUMENTATION PROGRAM:
 - PROGRAM REQUIREMENTS DOCUMENT
 - SYSTEM TEST OBJECTIVES
 - SYSTEM TEST AND OPERATIONS PLAN
 - VAFB LAUNCH OPERATIONS REQUIREMENTS
 - CHECKOUT REQUIREMENTS PLAN
 - RANGE DOCUMENTS
 - FLIGHT VEHICLE CHECKOUT PLAN
- ESTABLISH, ANALYZE, MAINTAIN MOL INTEGRATED TEST FLOW AT VAFB
- CONTINGENCY PLANNING
- MONITOR FACTORY TEST FLOW
- REVIEW/ANALYZE CONTRACTOR TRAINING, CERTIFICATION
- EVALUATE TEST REQUIREMENTS ESTABLISHED BY BLOCK 7.0 STD
- MAINTAINABILITY ANALYSIS
- SUPPORT STUDIES - I.E., LAUNCH CONSTRAINTS, FOLLOW ON PROGRAMS, RESCHEDULES, ETC.
- FORMAL COORDINATION LINK BETWEEN ENGINEERING, OPERATIONS AND VAFB FOR PLANS, POLICY TEST REQUIREMENTS AND DOCUMENTATION

LAUNCH SYSTEMS INTEGRATION

- SITE ENGINEERING AND ACTIVATION
 - CONTINUAL ANALYSIS OF INCP'S, FCR'S, ECP'S, FOR EFFECTS ON INTEGRATED HARDWARE AT VAFB
 - PARTICIPATE IN DESIGN CRITERIA OF SLC-6 AND M.S.F.
 - PLAN AND MONITOR THE TOTAL ACTIVATION EFFORT TO INSURE COMPATIBILITY BETWEEN FACILITY/AGE/AVE AND OPERATION PERSONNEL
 - PARTICIPATE IN AGE INSTALLATION AND CHECKOUT BUY-OFF PROCESS
- INTEGRATION
 - PARTICIPATE IN AVE/AGE DESIGN REVIEWS TO INSURE OPERATIONS REQUIREMENTS, FOR COMPATIBILITY, FLEXIBILITY AND SAFETY ARE MET
 - PARTICIPATE IN AVE/AGE/FACILITY INTERFACE DEFINITION
 - PARTICIPATE IN DEVELOPMENT OF TEST REQUIREMENTS, PLANS AND PROCEDURES
 - PARTICIPATE IN HARDWARE/SOFTWARE ACCEPTANCE
 - FORMAL COORDINATION LINK WITH VAFB AND LA FOR EVALUATION OF OPERATING PROBLEMS AT VAFB
 - MONITOR PROGRESS AND STATUS OF ACTIVITY AT VAFB
 - PARTICIPATE IN VAFR TEST DATA ANALYSIS
 - ECP COORDINATION FOR PLOT DIRECTORATE

GENERAL SUPPORT BY BOTH PLANNING & LAUNCH SYSTEMS

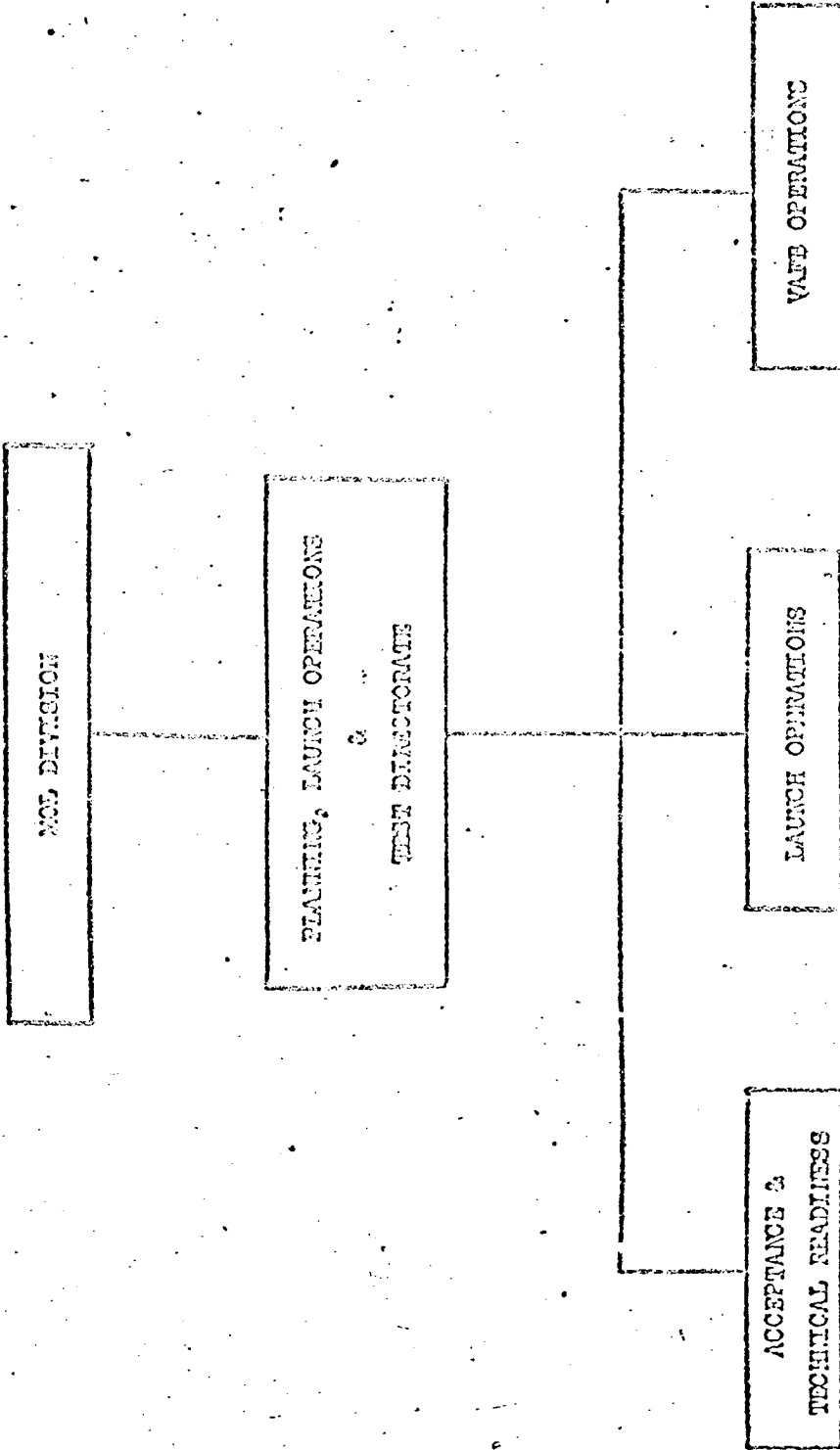
- MAINTAIN CURRENT WORKING KNOWLEDGE OF FV/AGE SYSTEMS, AND PROGRAM POLICIES, OBJECTIVES.
- SUPPORT THE FOLLOWING WORKING GROUPS
 - ACTIVATION
 - FACILITIES
 - GROUND SYSTEMS COORDINATION
 - LAUNCH OPS FLOW
 - LAUNCH OPERATIONS PLANNING (LA)
 - LAUNCH OPERATIONS (VAFB)
 - SAFETY GROUP (S)
- SUPPORT SEGMENT OFFICES AS REQUESTED - TD's, TEM's, TSOM's
- GENERAL EVALUATION/STUDIES - SOW's, SCHEDULES, SAFETY, RELIABILITY
- PARTICIPATE IN FLIGHT READINESS DETERMINATIONS

VAFB LAUNCH OPERATIONS

- REPRESENT DIRECTOR MOL DIVISION AEROSPACE CORPORATION IN FULFILLING GENERAL SYSTEMS ENGINEERING/TECHNICAL DIRECTION RESPONSIBILITY TO MOL/SO
- TYPICAL DUTIES INCLUDE:
 - MONITOR FACILITY CONSTRUCTION FOR MOL PECULIAR FACILITIES
 - REVIEW AND/OR APPROVE MOL GROUND SYSTEMS TEST PROCEDURES
 - MONITOR PERFORMANCE OF MOL GROUND SYSTEMS TEST PROCEDURES AND PARTICIPATE IN BUY-OFF OF GROUND SYSTEMS
 - PARTICIPATE IN FACILITIES WORKING GROUP
 - PARTICIPATE IN AGE/AVE PDR'S AND CDR'S
 - PARTICIPATE IN AVE ACCEPTANCE TESTING
 - PARTICIPATE IN VAFB TEST FLOW PLANNING AND REVIEW/APPROVE VAFB TEST PLANS
 - REVIEW AND/OR APPROVE ALL VAFB AGE/AVE TEST PROCEDURES
 - MONITOR ALL VAFB TESTING AND PARTICIPATE IN PROCEDURE BUY-OFFS
 - PARTICIPATE IN POST TEST DATA REVIEW AND EVALUATION
 - PARTICIPATE IN ENGINEERING REVIEW TEAM ACTIVITIES
 - SUPPORT THE ATW IN COORDINATION OF GROUND AND RANGE SAFETY REQUIREMENTS WITH THE AFWTR AND IST STRADAD
 - PROVIDE TECHNICAL CHAIRMAN TO LAUNCH OPERATIONS WORKING GROUP AND ASSOCIATED SUB-GROUPS
 - SUPPORT THE ATW IN PREPARATION OF POST LAUNCH EVALUATION REPORTS

~~SECRET~~ ~~DOMAIN~~

WORKING MATERIAL



HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

~~SECRET~~ ~~DOMAIN~~

WORKING MATERIAL

~~SECRET~~
~~SECRET~~

WORKING MATERIAL

RESPONSIBILITIES & DUTIES OF VAEB 632A OFFICE

REPRESENT DIRECTOR MOL DIVISION AEROSPACE CORPORATION IN FULFILLING GENERAL SYSTEMS
ENGINEERING/TECHNICAL DIRECTION RESPONSIBILITY TO MOL/SO.

TYPICAL DUTIES INCLUDE:

- MONITOR FACILITY CONSTRUCTION FOR MOL PECULIAR FACILITIES
- REVIEW AND/OR APPROVE MOL GROUND SYSTEMS TEST PROCEDURES
- MONITOR PERFORMANCE OF MOL GROUND SYSTEMS TEST PROCEDURES
AND PARTICIPATE IN BUY-OFF OF GROUND SYSTEMS
- PARTICIPATE IN FACILITIES WORKING GROUP
- PARTICIPATE IN AGE/AVE PDR'S & CDR'S
- PARTICIPATE IN AVE ACCEPTANCE TESTING
- PARTICIPATE IN VAEB TEST FLOW PLANNING AND REVIEW/APPROVE
VAEB TEST PLANS
- REVIEW AND/OR APPROVE ALL VAEB AGE/AVE TEST PROCEDURES
- MONITOR ALL VAEB TESTING AND PARTICIPATE IN PROCEDURE
BUY-OFFS

~~SECRET~~
~~SECRET~~

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY
WORKING MATERIAL

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~~SECRET~~
ROMAN

WORKING MATERIAL

RESPONSIBILITIES & DUTIES OF VAEB 632A OFFICE

(CONTD)

- o PARTICIPATE IN POST TEST DATA REVIEW AND EVALUATION
- o PARTICIPATE IN ENGINEERING REVIEW TEAM ACTIVITIES
- o SUPPORT THE ATW IN COORDINATION OF GROUND AND RANGE SAFETY REQUIREMENTS WITH THE ATWER AND 1ST STRADAD
- o PROVIDE TECHNICAL CHAIRMAN TO LAUNCH OPERATIONS WORKING GROUP AND ASSOCIATED SUB-GROUPS
- o SUPPORT THE ATW IN PREPARATION OF POST LAUNCH EVALUATION REPORTS

WORKING MATERIAL

~~SECRET~~
~~SECRET~~
ROMAN

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

WORKING MATERIAL

~~SECRET~~
~~ORIGIN~~

INSPECTOR - MOL VAFB
CC — Staff
Ground Safety
Crew Safety

NEW 015

MGR-TILL-N
OS

Prop & Hydraulics
Power, Auto/lot & MDS
Guidance
RF (TRAS, RS & GENUS)

MGR C-B
OS

Power & Sequential
Guidance & Controls
ECS & MDS
Inst. & Comm

MGR-LV
OS

ACIS/SCE
ECIS/ACIS (Prop)
Power, Display & Control
Data Management/SCIS

MGR-ORBY
OS

ACIS
LASE
MASE
SCF INT.

CAGE
FACILITIES
Director
Managers
MALS
MTC
CC

1
4
3
42 + CITE
5

~~SECRET~~
~~ORIGIN~~

WORKING MATERIAL

WORKING MATERIAL

~~SECRET~~
~~DOWN~~

PROPOSED VAFB ORGANIZATION BASED ON FOLLOWING CONSIDERATIONS

IT MATCHES THE BASIC AEROSPACE ORGANIZATION AND
ALLOWS EACH VAFB MANAGER DIRECT ACCESS TO HIS
RESPECTIVE ENGINEERING DIRECTOR

IT PROVIDES EASY AND DIRECT CONTACT WITH MOL CONTRACTORS
AT VAFB

BEING SYSTEM ORIENTED IT PROVIDES FULL SUPPORT TO THE
ATW (BOTH OPERATIONS AND ENGINEERING AND SAFETY BRANCHES)
WITH A MINIMUM NUMBER OF MTS'S

LEVEL OF MANPOWER PROPOSED IS CONSIDERED THE MINIMUM
NECESSARY TO PROVIDE FULL TIME COVERAGE OF LAUNCH AND CREW
OPERATIONS AND ASSURES EL SEGUNDO AUGMENTATION DURING
PERIODS OF PEAK ACTIVITY

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~~DOWN~~

WORKING MATERIAL

D

6

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~~ROBERT J. DURAN~~

26 May 1968

MANPOWER REQUIREMENTS FOR

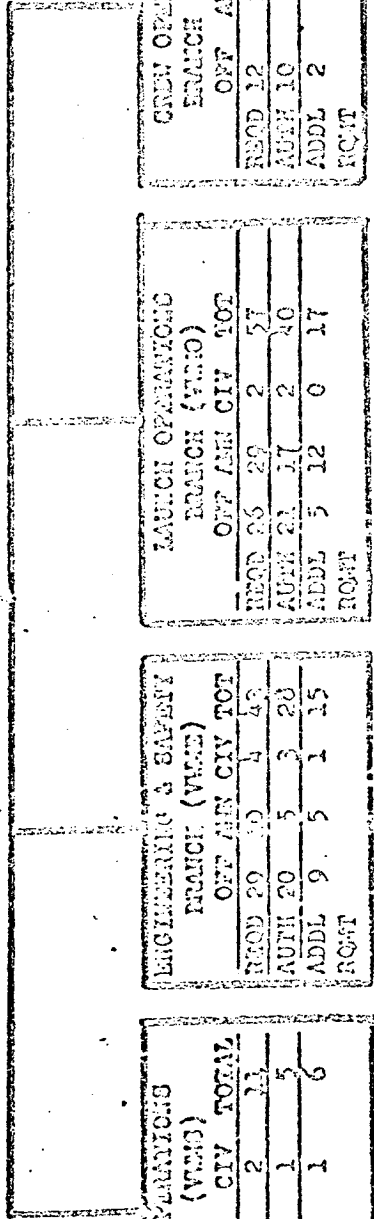
MANNED PROGRAMS DIVISION (VHM)

WORKING MATERIAL

COMMANDER
6595TH ADDRESSPACE TEST WG

RECAP
OFF 75
ADM 55
CIV 12
TOTAL 131

MANNED PROGRAMS DIVISION (VHM)				
REQ	OFF	ADM	CIV	TOTAL
	2	0	2	4
ADM	2	0	2	4
ADDL	0	0	0	0
RCPT				



SUPPORT OPERATIONS BRANCH (VMSO)				
REQ	OFF	ADM	CIV	TOTAL
	6	3	2	11
ADM	2	2	1	5
ADDL	4	1	1	6
RCPT				

ENGINEERING & SAFETY BRANCH (VMSF)				
REQ	OFF	ADM	CIV	TOT
	20	10	4	43
ADM	20	5	3	28
ADDL	9	5	1	15
RCPT				

LAUNCH OPERATIONS BRANCH (VMSL)				
REQ	OFF	ADM	CIV	TOT
	26	29	2	57
ADM	21	17	2	40
ADDL	5	12	0	17
RCPT				

GREEN OPERATIONS BRANCH (VMSG)				
REQ	OFF	ADM	CIV	TOT
	12	2	2	16
ADM	10	0	2	12
ADDL	2	2	0	4
RCPT				

HANDLE VIA EYEMAN
CONTROL SYSTEM ONLY

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~~ROBERT J. DURAN~~
WORKING MATERIAL

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SECRET EYEMAN

WORKING MATERIAL

WAFB SHAWFING PLAN

	FY 69			FY 70			FY 71			
	July 68	Oct 68	Jan 69	April 69	July 69	Oct 69	Jan 70	April 70	July 70	Oct 70
NCR TIII-M										
TIII-M Prop/Ryd (2)										
TIII-M Power/AP/MS (3)										
TIII-M Guidance (2)										
TIII-M RF (3)										
TIII-M CAGE (2)										
SIC-6 Facilities (2)										
Sub Total by Qtr										
NCR O-B										
Power & Seq (2)										
Guidance (3)										
BCS & RCS (2)										
Inst & Comm (3)										
Sub Total by Qtr										
NCR LV										
ACTS/SCE (3)										
ECLS/ACTS (2)										
Power & Control (3)										
SOIS/Data (3)										
ASTEG/CITE (2)										
Experiments (4)										
Sub Total by Qtr										
Ground Safety (2)										
Crew Safety (1)										
CS (4)										
MAS (3)										
MTS/QTR										
CS/QTR										
TOTAL MTS										
TOTAL MTS (OV only)										

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SECRET EYEMAN

14

16

17

18

19

WORKING MATERIAL

9 AUGUST 1968

~~SECRET DORIAN~~

STAFFING PLAN BASED ON THE FOLLOWING ASSUMPTIONS UTILIZING PRESENT SCHEDULES:

1. OTEF Manning not covered by this plan.
2. All MTS's assigned to IV and/or C-B must be cleared.
3. MTS's assigned to THX-M should be cleared but not absolutely essential.
4. Allow 6 months for clearances.
5. Three months minimum at VAND prior to AWE delivery for system familiarity.
6. Access to IES restricted after first launch.

Therefore:

The C-B office must be fully manned by November 1970. This allows cover weekly minimum prior to delivery of C-B C to SIG-6.

The IV office must be fully manned by December 1970. This allows nine months minimum prior to delivery of flight three IV to SIG-6.

NOTE: MTS assigned to IV can acquire limited system familiarity without clearance but will not be able to participate in meetings or factory testing.

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ROUGH DRAFT

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

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WORKING MATERIAL

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

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WORKING MATERIAL

SPACE ALLOCATIONS FOR ATTORNEYS 1962 PERSONNEL

11A7 1000 - Director's Office

11A7 1000 - MAIN OFFICE - RA 622

- 1 Director
- 2 Secretary & Filing Area
- 2 1012
- 1 Secretary & Filing

- 2 Manager
- 2 Secretary & Filing Area
- 2 1012

202 C-3 & IV - Rooms 170, 179 & 180

170	2 Secretaries	179 & 180	4 Secretaries
178A	Conference	179A & 180A	12
178B	3	179B & 180B	2 Managers
178C	Space Office	179C & 180C	6
178D	Space etc.	179D & 180D	6
178E	2	179E & 180E	6
178F	2	179F & 180F	6

HANDLE VIA EYEMAN
CONTROL SYSTEM ONLY

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WORKING MATERIAL

WORKING MATERIAL

~~CLASSIFIED BY~~
~~DATE~~

AEROSPACE INTERFACE WITH MISSION SUPPORT CONTRACTOR

MSC TASK

AEROSPACE ROLE & RESPONSIBLE OFFICE

PROVIDE SECRETARIAT TO MISSION SUB
WORKING GROUP

AEROSPACE VAFB PROVIDES TECHNICAL
CHAIRMAN TO VAFB WORKING GROUPS
(SAFSL 20023)

PROVIDE INTEGRATED OV LEVEL BLOCK 7
AND BLOCK 11 STD

AEROSPACE MOL DIVISION REVIEW AND
APPROVE

PREPARE INTEGRATED LV AND OV
SCHEDULES AND TEST PROCEDURES AND
OV INPUTS TO LSC

AEROSPACE VAFB REVIEW AND APPROVE
(SAFSL 20023)

MAINTAIN OV STATUS AND PROVIDE INPUTS
TO LSC

NO TASK STATUS INFORMATION AVAILABLE
TO AEROSPACE

SUPPORT SLC-6 SAFETY PROGRAM (MPS)
(BOTH HAZARD ANALYSIS AND OP PAD
SUPPORT)

AEROSPACE MOL DIVISION AND VAFB
REVIEW ANALYSIS FOR IMPACT

PROVIDE INTEGRATED REQUIREMENTS AND
SCHEDULING SUPPORT TO MISSION SIMULATOR

AEROSPACE ROLE NOT DEFINED

HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

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WORKING MATERIAL

AEROSPACE INTERFACE WITH LAUNCH SUPPORT CONTRACTOR

LSC TASKS

AEROSPACE ROLE & RESPONSIBLE OFFICE

PROVIDE SECRETARIAT TO VAFB WORKING GROUP

AEROSPACE VAFB PROVIDES TECHNICAL CHAIRMAN TO VAFB WORKING GROUPS (SAFSL 20023)

INTEGRATE BLOCK 7 AND BLOCK 11 STD

AEROSPACE MOL DIVISION REVIEW AND APPROVE

PREPARE INTEGRATED SLC-6 SCHEDULES AND TEST PROCEDURES

AEROSPACE VAFB REVIEW AND APPROVE (SAFSL 20023)

PROVIDE INTEGRATED SLC-6 STATUS AND OPERATE DATA COLLECTION AND STATUS CENTER

NO TASK - ALL DATA AND STATUS INFORMATION AVAILABLE TO AEROSPACE

SUPPORT SLC-6 SAFETY PROGRAM (BOTH HAZARD ANALYSIS AND ON-PAD SUPPORT)

AEROSPACE VAFB AND MOL DIVISION REVIEW ANALYSIS FOR IMPACT

INTEGRATE AND PUBLISH FLIGHT VEHICLE SUPPORT DOCUMENTATION FVCOP, LTD, RSR AND FTS

AEROSPACE MOL DIVISION REVIEW AND APPROVE FVCOP, RSR AND FTS, VAFB OFFICE REVIEW AND APPROVE LTD

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HANDLE VIA BYEMAN
LAUNCH SYSTEM ONLY

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~~SECRET~~

MANAGEMENT SYSTEMS
AND ADMINISTRATION
J. F. Chalmers - Director
W. H. Schumann - Div Admin

PROGRAM
SCHEDULES
R. H. VanEsselstyn

CONFIGURATION
MANAGEMENT
R. W. Rector - Mgr

MANAGEMENT SYSTEMS & ADMINISTRATION

J. F. Chalmers

Supervises Configuration Management effort, Program Schedules group and MOL Division Administration. Acts in Staff capacity to W. C. Williams. Provides Air Force with point of contact for: Deputy Director, MOL - SAFSL-1; Program Control Directorate - SAFSL-4, Configuration Management Directorate - SAFSL-5; and Systems Integration and Requirements Directorate - SAFSL-6.

R. W. Rector

Responsible for all technical administrative effort involved in Aerospace review of contractor change proposals. Represents Aerospace on Air Force Configuration Control Board. Supervises Configuration Management effort including documentation, specifications, interface program and First Article Configuration Inspections (FACI's).

MTS

Work with associate contractors to upgrade their proposal submittals and to acquire "upstream" knowledge of projected changes.

J. Lippitt

Responsible for MOL Interface Program administration. Assures that Aerospace performs a timely, coordinated, complete and coherent job on all interface documentation. Maintains status on all interface documents.

ADVANCED PLANS AND
REQUIREMENTS
C. L. Olson - Director

COST
ESTIMATION

SYSTEM ANALYSIS
E. U. Garabaro

DESIGN
T. H. Silva

M. Weiss

T. J. Nishizaka
A. L. Paynter
H. L. Solomon

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Copy 1 of 1
Page 1 of 9
Total Pages: 9

20 November 1968

C. L. Olson

ADVANCED PLANS AND REQUIREMENTS OFFICE

CHARTER, FUNCTIONAL DESCRIPTION, AND MTS REQUIREMENTS

HANDLE VIA BYEMAN
COMMON SYSTEM ONLY

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ADVANCED PLANNING OBJECTIVES

A. General

The principal and initial objective of the MOL program is the development and early demonstration of an operationally useful high resolution optical reconnaissance system capable of achieving ground resolution of [REDACTED]. In conjunction with the achievement of the principal program objective, provisions are also to be made for increasing the baseline system capability by extending on-orbit lifetime and incorporating advanced optical systems [REDACTED].

Growth versions of the MOL system shall not be limited to the baseline MOL system concept of integral crew and laboratory launches. Other techniques, such as rendezvous and resupply operations utilizing variations of baseline MOL system segments, shall be considered.

B. Advanced Planning Objectives and Requirements

Achievement of the increased system capabilities prescribed by the basic program objectives can only result from timely and effective advanced planning of MOL growth configurations. Appropriate studies and analyses and other supporting planning activity must therefore be pursued in support of the following objectives:

1. Improved system economics in both R&D and operational phases, with specific consideration of increased mission duration and extended utilization of baseline or direct derivations of baseline system segments. Both integral launch and rendezvous techniques are to be investigated.
2. Improved operational flexibility through the use of combined mission configurations, multi-sensor arrangements, larger crew complements, resupply techniques, orbital storage.
3. Increased mission performance through improvements to the baseline sensor capability, incorporation of higher resolution payloads, use of additional or complementary payload capabilities, and the application of advanced data management and recovery techniques.
4. Development of growth versions with diversified mission potential for support of DOD, NASA or other national requirements that may arise; such as long duration bio-astronautic investigations, meteorology, multi-spectral earth sensing, astronomy and planetary observation, and the conduct of other experiments of military or national relevance.
5. Investigation of advanced techniques and technologies leading directly to improved optical sensors and systems capable of ground resolution approaching the limits imposed by atmospheric phenomena. Some of the major aspects to be investigated are:

- a. System configurations
- b. Components and materials
- c. Navigation, control and drive systems
- d. Bulk, weight and mass considerations
- e. Supporting subsystem requirements
- f. Vibration environment

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Advanced Plans and Requirements

MOL Division

Advanced Plans and Requirements

Basic Objective

Provide plans and identify associated requirements for the Manned Orbiting Laboratory System to define follow-on programs, system growth, and alternate applications of the MOL System to DOD and National Space Objectives. Short and long range plans shall be developed to define approached for obtaining improved system economics, performance and operational flexibility.

Functions and Responsibilities

1. Responsible for the preparation and presentation of advanced planning for the MOL Program. This area of responsibility shall include the analysis of Mission Payload Elements, Vehicles, AVE, AGE, Facilities, and Operational Requirements to define recommended System Characteristics in terms of the following: Design, Performance, Costs, Schedules and System Effectiveness. These studies shall identify mission objectives, contributions of the crew, and the corresponding requirements/impact on MOL System segments. Study results shall present recommended and alternative approaches for system design modification and operational employment with associated performance, cost, schedule and system effectiveness estimates.
2. Plan and direct technical effort for funded Contractor studies of applications and evolutionary growth of the MOL system. This effort shall encompass the preparation of study objectives, technical criteria, and the rendering of technical direction to the Contractor during study conduct, in accordance with MOL/SO and MOL/PO agreements and study funding.
3. In the performance of the above stated functions, Advanced Plans and Requirements shall report directly to the Office of the General Manager, MOL Division. Additionally, Advanced Plans and Requirements shall coordinate planning activities with the responsible MOL offices for engineering and operations within Aerospace.
4. The activities of Advanced Plans and Requirements shall be performed on the basis of continuing coordination with the Advanced Plans and Requirements Directorate MOL/SO, and shall be responsive to the needs of that Directorate as defined by agreed upon priorities and manpower.

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COST ANALYSIS

MOL Division

Advanced Plans and Requirements

Cost Analysis

Basic Objective

Provide cost estimates and analysis of fiscal funding options in support of advanced planning and applications for the MOL System, and support baseline program costing activities.

Functions and Responsibilities

1. Perform studies to define estimated costs for vehicle/subsystem design modification, fabrication, testing, and operational support as required for MOL system follow-on programs, system growth planning and for applications of developed hardware/software to specified alternate uses. Estimates shall normally be defined in terms of non-recurring and recurring costs, and shall be presented in adequate detail to support the particular planning study.
2. Obtain and maintain a current source of cost data for space vehicle development and operations. Data shall encompass NASA as well as DOD programs for unmanned and manned systems.
3. Participate in Cost/Reliability Effectiveness analyses with other appropriate functions within Advanced Plans and Requirements. It shall be an objective of this effort to develop meaningful techniques for effectiveness evaluations including computer programs for use in fast response analysis.
4. Prepare breakdowns of cost elements to be utilized in funded Contractor studies, and where required prepare approved cost data to be used in the study.
5. Cost Analysis shall report directly to the Advanced Plans and Requirements Director, and shall be responsible to him for the satisfactory performance of the above stated functions.

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SYSTEM ANALYSIS SECTION

MOL Division

Advanced Plans and Requirements

System Analysis Section

Basic Objective

The System Analysis Section of the Advanced Plans and Requirements Office is responsible for the development of candidate improvements of and additions to the MOL mission payload.

Functions and Responsibilities

1. Improvements of the primary MOL mission (technical intelligence) are derived from analyses of the system operational capability and sensor performance. Operational analyses focus on the benefits to the primary mission of variations in orbital performance profile, terrestrial illumination and coverage, and mission duration. Sensor performance enhancement studies concentrate on improved resolution through increased focal length, aperture utilization, and scene recording improvements.
2. Additions to the MOL mission typically involve extensions of the MOL vehicle application. Examples of such additions are the recent incorporation of [REDACTED] planetary photography to the MOL mission profile. Studies are currently underway on missions which may require additional equipment compliments (e. g. geodetic targeting).
3. The flexibility of the MOL system is exploited by studies into such mission enhancements as wide-band data transfer and multi-spectral (visible and infra-red) analyses of targets using a modified Dorian payload.
4. Low level studies are also directed toward application of the MOL to requirements of other agencies (e. g. astronomy, Navy radar, elint, etc.).
5. During all phases of study, technology requirements, if identified, are directed to appropriate offices in SAMSO or the Special Projects Office.
6. System Analysis shall report directly to the Advanced Plans and Requirements Director, and shall be responsible to him for the satisfactory performance of the above stated functions.

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DESIGN

MOL Division

Advanced Plans and Requirements

Design

Basic Objective

Support Advanced Planning and Applications of the MOL System by providing design studies of vehicles and vehicle subsystems and to conduct vehicle performance studies, perform evaluations of vehicles, and assess modes of system utilization.

Functions and Responsibilities

1. Perform design analyses to determine tradeoffs leading to preferred vehicle configurations.
2. Provide weight estimates for vehicle systems under consideration.
3. Identify appropriate test requirements associated with alternative systems under consideration, including requirements for AGE, facilities, and operational support.
4. Provide estimates of subsystem and vehicle reliability. Identify crew activities for in-space maintenance, including additional equipment access, redundancy and spares concepts, and specialized crew training.
5. Obtain and evaluate performance data for launch vehicles applicable to MOL System growth and applications.
6. Perform studies to define vehicle launch factors, constraints, and launch windows. Evaluate alternate operational modes and tradeoff considerations, including special trajectories such as rendezvous/intercept.
7. Perform orbital parameter studies to determine orbit sustenance and optional orbit adjustment maneuvers.
8. Monitor current in-house and Industry studies related to design and performance of vehicle systems, such as maneuvering re-entry vehicles and un-manned resupply vehicles, and conduct additional in-house studies to determine adaptability to the MOL follow-on program.

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Functions and Responsibilities (Continued)

9. Monitor NASA near earth orbit mission plans and respond as required, with vehicle design and performance data for potential application of the MOL developed hardware to the national space program goals.
10. Prepare technical criteria, design concepts, performance data, and trajectory envelopes as required for funded Contractor studies.
11. Design shall report directly to the Advanced Plans and Requirements Director, and shall be responsible to him for satisfactory performance of the above stated functions.

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FUNCTIONAL ASSIGNMENTS

ADVANCED PLANS & REQUIREMENTS

C. L. Olson (Director)

J. Neiss*
(Cost & Schedule Analysis)

E. Gambaro (Mission & P/L Analysis)

M. Weiss (Communications & Technology)

T. Silva (Configuration Analysis & System Design)

A. Paynter (Subsystems & Reliability)

H. Solomon (Orbit Mechanics & Vehicle Performance)

T. Nishizaka (Preliminary Design & Weights)

*Transfer in process

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Tasks requested but not performed

1. Effect on system performance of index variations in reflective components.

~~2. Detailed system stress analysis.~~

3. Analysis of Ross connector in primary mirror alignment system (not part of Ross)

4. Dynamic and static petiole performance analysis. (Surface errors)

5. Detailed examination of candidate CWS systems including tilt and rubometric efficiency analysis.

6. Visual optics (main optics) system design analysis.

7. Impact of revised thermal analyses on system performance.

8. Detailed stress load or stress and glue analysis including effect of thermal control panels.

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TOP SECRET

9. Survey and analysis of image enhancement or restoration techniques for camera and/or other systems.
10. Detailed analysis of star tracker performance.
11. Detailed analysis of bus signaling errors between ATSS and COA/TM axes.
12. Comprehensive evaluation of optical testing procedures at component and system levels. Should have very high priority.
13. On orbit performance verification methods including possible diagnostic procedures.
14. Cue display design evaluation.
15. Transmittance (losses/efficiency) analysis of all optical systems.
16. Development of terrain and star cameras to acquire primary mission payload.

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17. Improved film handling and processing procedures.

18. Support in selection of optimum filter characteristics to enhance image information content.

19. Extended efforts in COA redesign to reduce obscuration and improve performance.

Items not specifically requested but which should receive attention.

1. Contamination (from all sources) of optical components.
2. Focus sensor.

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AEROSPACE CORPORATION

INTEROFFICE CORRESPONDENCE

TO: MOL Directors &
Group Directors

CC:

DATE: 19 November 1968

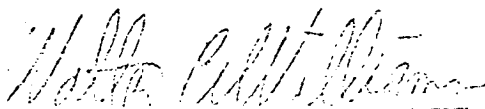
SUBJECT: ESO Activities

FROM: W. C. Williams

The entire agenda of the regular weekly MOL Division/ESO joint meeting of Thursday, 14 November, consisted of a report by ESO on their activities in support of MOL. The electronics portion of the task presentation was given Tuesday, 19 November 1968.

Copies of the charts presented are attached. Will you please analyze this information with a particular view toward possible changes in emphasis or shifting from "Tasks deferred" and "Tasks not being worked" into the "Current Tasks" category (and vice versa).

Your analysis of the attached material should be prepared for review by J. F. Chalmers by Thursday afternoon, 21 November 1968.



W. C. Williams

Attachments

Task

MTS/Week

Requestor

Product Assurance (Reliability Dept.)

Appraisal of contractors' parts selection and application and quality programs.

McGhee

0.5

✓ Environmental Criteria (Reliability Dept.)

Upgrade environmental criteria SAFSL; validate test facilities; determine environmental criteria for Gemini abort profile; and use wind tunnel data for validation of environmental specifications.

Schrader, Fest,
King, Carrington

1.0

✓ Reliability Engineering and Analysis (Reliability Dept.)

Review the communications and subsystems electronic packaging; assess the contractors reliability models, conduct a reliability analysis for the complete MOL system and attend design reviews; review documents for determining reliability deficient areas of the Star Tracker; conduct a reliability analysis review of AGE.

Nordyke, Kiefer,
McGhee, Marott,
Ackerman, Wolfe

3.0

System Safety Study (Staff)

Formulate an overall systems safety plan and assist in conducting the analysis.

Wolfe

0.5

✓ Trajectory Studies (Performance Analysis)

Conduct abort studies for Mode B/E' switchover; validate MAC abort ceilings, determine low altitude abort lateral loads and monitor Mode C abort software program; conduct flight reference trajectories for orbital and GBO vehicles; conduct reentry dispersion and de-orbit constraint studies; review backup configuration documentation.

Pittman, Wolfe,
Blanciak, Meltzer

1.0

Task Requestor MIS/Week

✓ Flight Test Planning (Test Operations Dept.)

Assist in the preparation of Program Requirements, Orbital Requirements and System Test Objectives documents; prepare Range Safety reports; perform meteorological and oceanographic studies.

Fling, Carmichael,
Wolfe, Bianciak,
Campbell

4.0

Hardware Acceptance (Test Operations Dept.)

Monitor performance of ground systems during test to determine acceptability.

DeLorenzo

1.0

STEINMAN.

TASKS NOT BEING SUPPORTED

<u>Task</u>	<u>Requestor</u>	<u>M/TS/Week</u>
<input checked="" type="checkbox"/> <u>Support to Backup Configuration (Reliability and Performance Analysis Depts.)</u> Furnish support in the areas of reliability, product assurance, environmental criteria and performance.	Blackwell, Carrington, Blanciak	3.5
<u>Product Assurance (Reliability Dept.)</u> Appraisal of contractors parts selection and application and quality programs for overall vehicle.		3.0,

Maria D
MAIER

ENGINEERING ANALYSIS SUBDIVISION

CURRENT JOBS IN PROGRESS

<u>Description</u>	<u>Organization</u>	<u>Requestor</u>	<u>MTS/Week</u>
Analytical and Experimental Investigation of ACTS Plume Contamination	Fluid Mechanics Propulsion	Maffei	3.0 <input checked="" type="checkbox"/>
Structural and Dynamic Analysis of SS-B and Related Studies	Solid Mechanics	McGhee	2.0 <input checked="" type="checkbox"/>
Preparation of OV Dynamics Model in Orbital Configuration	Solid Mechanics	Dezellan	1.0 <input checked="" type="checkbox"/>
Orbital Heat Transfer Analysis for OV and Back-up Configuration	Fluid Mechanics	Smith Emerson Meltzer	3.0 <input checked="" type="checkbox"/>
Vibration, Flutter and Buffet Analysis of MM, UPC and Meteoroid Shield	Solid Mechanics	Herndon	1.5 <input checked="" type="checkbox"/>
Monitor Development, Test, Fabrication and Delivery of ACTS Propulsion System	Propulsion	Herrmen	2.0

** Indicates computer support required*

MAIER

ENGINEERING ANALYSIS SUBDIVISION

CURRENT JOBS IN PROGRESS (CONTINUED)

<u>Description</u>	<u>Organization</u>	<u>Recruiter</u>	<u>MFC/Mark</u>
Development of Orbital Drag Computer Program	Fluid Mechanics	Moss	0.5 X
Mode B Abort Study	Solid Mechanics	King Herndon	1.0 X
Ascent Venting and Contamination Study	Fluid Mechanics	Herndon	1.0 X
Review of DAC-Structural Analyses; Development Tests and Modal Vibration Test Plans	Solid Mechanics	Herndon	1.5
Explosive Oxidation Study	Solid Mechanics	King Herndon Wolfe	1.0

X Indicates computer support required

main

ENGINEERING AREA CASE SUBDIVISION

TASKS REFERRED BY TO CASE NUMBER CONTACT

Description	Organization	Requestor	MIS Required
Additional Ascent and Orbital Contamination Analysis	Fluid Mechanics Propulsion	Maffei	2.0 : Outside Contract Work <input checked="" type="checkbox"/>
- Non-Propulsive Sources			
- Computer Program Development for Analysis of Engine Start and Stop Transients			
- Laboratory Tests of Constant Volume Combustion Bi-Propellant Gas Generator			
Structural and Dynamic Analysis of SS-C and SS- α	Solid Mechanics	Dezelan	1.0 <input checked="" type="checkbox"/>
OV Thermal and Thermal Deformation Analysis	Fluid Mechanics	Emerson	1.5 <input checked="" type="checkbox"/>
- Development of UPC and MM Thermal Models	Solid Mechanics		
- MM Component Analysis			
Dynamic Analysis of Back-up Configuration	Solid Mechanics	Carrington	1.0 <input checked="" type="checkbox"/>
- Review of SS- ϵ Structural and Dynamic Models			
- Development of Ascent and Orbital OV Dynamic Models			

X Indicates computer support required

MAILED

ENGINEERING ANALYSIS SUBDIVISION

TASKS DEFERRED DUE TO XANFOOPER SHORTAGE (CONT'D)

<u>Description</u>	<u>Organization</u>	<u>Responsible</u>	<u>MIS Required</u>
Ascent Heating Analysis	Fluid Mechanics	Moss	1.5 X
- Determination of Max. Heating Trajectory			
- Protuberance Heating			
Payload Structural Deformation Analysis and Test Procedures	Solid Mechanics	Emerson	3.0 X
- Components			
- System			
Re-entry Heating for Dispersed Trajectories	Fluid Mechanics	Blancink	1.0 X
SS-B Dynamic Response During Ground Tests	Solid Mechanics	Fest	0.5 X
Investigation of Adequacy Present On-Board Gauging Systems	Propulsion	Herman	0.5

X Indicates computer support required

C

WILLIAMS C

SYSTEMS DESIGN SUBDIVISION

CURRENT TASKS

DESIGN SUPPORT (VEHICLE SYSTEMS DEPT.) - STRONG, HENRY, MOSS, MELTZER 4 MTS

EVALUATION OF CONTRACTOR DESIGNS, ANALYSES, AND TESTS ON BEARINGS, ALIGNMENT, THERMAL COVER, BACKUP CONFIGURATION, CREW EXERCISER, PSA NECK RING, ETC.

MASS PROPERTIES (VEHICLE SYSTEMS DEPT.) - ROSOFF 3 MTS

REVIEW AND EVALUATE CURRENT MASS PROPERTIES WORK OF EACH CONTRACTOR, FCPs, VERIFICATION AND OPERATIONAL SUPPORT PLAN, EPSILON SUBSYSTEM, PREDICT WEIGHT GROWTH TRENDS, MONITOR AFFECTS OF INTERFACE CHANGES.

ORDNANCE (VEHICLE SYSTEMS DEPT.) - MOSS, PITTMAN, HENRY 1/2 MTS

SUPPORT BEING PROVIDED ON DESIGN REQUIREMENTS, SAFETY CONSTRAINTS, DESIGN EVALUATION, TEST CRITERIA, ETC. FOR NON-CONTAMINATING SEPARATION JOINTS, HIGH TEMPERATURE EXPLOSIVES, AND CARTRIDGE DEVICES.

7

WILKINSON

SYSTEMS DESIGN SUBDIVISION

CURRENT TASKS

LIFE SUPPORT (POWER & LIFE SUPPORT DEPT.) - MOSS, WOLFE, FITTMAN 5 MTS

PERFORMANCE ANALYSIS STUDIES TO VERIFY CONTRACTOR
PREDICTIONS OF LABORATORY THERMAL CONTROL (INTERNAL
AND EXTERNAL LOOPS), CREW THERMAL COMFORT, ATMOSPHERE
CONTROL. CONDUCT SAFETY STUDIES INVOLVING FIRE ANALYSIS,
MATERIALS SELECTION, METEOROID PUNCTURE EFFECTS, FIRE
PREVENTION AND CONTROL. REVIEW AND EVALUATE CONTRACTOR
EFFORTS ON CO₂ REMOVAL, OXYGEN STORAGE, WATER
MANAGEMENT, WASTE MANAGEMENT, ATMOSPHERE AND CONTAMINANT
SENSORS. *Ammini B ECS*

POWER SYSTEMS SUPPORT (POWER & LIFE SUPPORT DEPT.) - MOSS, FITTMAN, OLSON 4 MTS

INVESTIGATE IMPACT OF MATRIX FUEL CELLS; COORDINATE WITH
NASA ON TEST PROGRAMS; REVIEW GENERAL BATTERY CAPABILITY
EXTENSION TO FOLLOW-ON MISSIONS; ADVANCED MOL FOWER
SYSTEM INTEGRATION (ELECTROLYTE/DRAINAGE CYCLES)

7

WILLEN 5

SYSTEMS DESIGN SUBDIVISION

CURRENT TASKS

LAUNCH PAD SAFETY (GROUND SYSTEMS DEPT.) - URBAN 1 MTS

REQUIRES COMPLETION OF GROSS HAZARD ANALYSIS DOCUMENT;
REVIEW AND EVALUATE CONTRACTOR SAFETY ANALYSIS; OPERATIONS
ANALYSIS OF CRITERIA FOR SLIDE WIRE SET; STUDY FUEL VENT STACK
RELOCATION; PARTICIPATE IN SAFETY WORKING GROUP.

MECHANICAL AGE & FACILITIES (GROUND SYSTEMS DEPT.) - MOSS, MELTZER, MCGHEE 4 MTS

PREPARE FOR CDR CF ~ 30 CEIS ON AGE FOR LABORATORY AND
GEMINI; INVESTIGATE OV TRANSPORTER DYNAMIC LOADS; EVALUATE
ACOUSTIC AND THERMAL VACUUM FACILITIES; LAUNCH PAD FACILITIES
PROBLEMS; AGE AND FACILITY EVALUATION UNIQUE TO EPSILON SYSTEM.

5

WILKINS

SYS FEAS DEFERRED VEHICLE

TASKS NOT DONE - CRASH

DESIGN SUPPORT (VEHICLE SYSTEMS DEPT.)

INVESTIGATE IMPACT OF CONTAMINATION ON VEHICLE REDESIGN
BY FIVE DETAILED REVIEW OF REDESIGN SYSTEM FAULTS. PROVIDE
DESIGN AND MASS PROPERTIES SUPPORT TO ADVANCED REDESIGN STUDIES.

LIFE SUPPORT (POWER - LIFE SUPPORT DEPT.)

VALIDATE THERMAL CONTROL ANALYSES TO OFF-NOMINAL CONDITIONS.
ANALYSIS OF EVA HEAT AND MASS TRANSFER REMOVAL. IDENTIFY
VULNERABILITY. ESTABLISH THERMAL LABORATORY APPROXIMATE COEFFICIENT
FRAGMENT RESPONSE TRACE ON EMBLEMANT CORRELATION CAPABILITY
AND EMERGENCY OPERATIONS.

POWER SUPPORT (POWER - LIFE SUPPORT DEPT.)

EVALUATION OF COAST/IDLE/BANKING CYCLES VS FLUCTUATION IN
TRAJECTORY CYCLE.

LAUNCH (VA - AND RECOVERY OPERATIONS) (PRODUCT SYSTEMS DEPT.)

CONDUCT LAUNCH AND RECOVERY STUDY OF LAUNCH AND RECOVERY
VEHICLE MANEUVERABILITY. EVALUATE OPERATIONAL CAPABILITY
AND VEHICLE COORDINATION. IDENTIFY LAUNCH AND RECOVERY
LIMITATIONS. REPORT TO BE SUBMITTED THROUGH REDESIGN PLAN.
CONDUCT STUDY.

ELECTROMECHANICAL DEPT.
(S.1 MTS)

<u>TASK</u>	<u>MTS LEVEL (F.O.)</u>	<u>DESCRIPTION</u>
• Drive J	0.2 (18)	Subsystem design review, component review, and TD.
• Drive A	1.4 (18)	System performance. Noise - closed loop. Bias - open loop. Stability analysis - verification of contractor σ . Component review, component performance.
• Beta System	1.1 (18)	Input characteristic definition. Data processing. Error analysis. Interface definition, TD.
• Alpha System	0.1 (18)	Component reviews, TD.
• LGA Hardware	0.1 (18)	Requirements and performance definition. TD and review.
• AVE Error Analysis	1.8 (28)	Component errors, alignment and installation errors, etc. Error analysis program development, Evaluation of ground alignment schemes. Software design review support (MEDS).

AVC EQN. DEV. SIMULATION

ELECTROMECHANICAL DEPT. (CONTINUED)

<u>TASK</u>	<u>MTS LEVEL (J.O.)</u>	<u>DESCRIPTION</u>
• Lab Studies.	0.7 (18)	Bearing torque noise studies. Torquing amplifier experimental verification. Air bearing simulator. 334C noise analysis, alignments, etc.
• AVE Testing and Evaluation	0.3 (18)	Test plan evaluation, following test program.
• ACTS	0.3 (30)	Electronic analysis.
• Simulation	2.1 (47)	In-house simulator development. Simulator performance requirements and philosophy, test plans, procedure, hardware design. Simulator experiment definition, monitoring. Simulator software evaluation. Mission simulator interface compatibility.

SCHWANE

GUIDANCE DYNAMICS DEPT.
(9.2 MTS)

<u>TASK</u>	<u>MTS LEVEL (J.O.)</u>	<u>DESCRIPTION</u>
o Ascent Guidance Equations	1.7 (15)	Analyze and simulate the ascent guidance required for Module 3 of the GIGS on-board computer. Develop and maintain B.C.S./MGS equations simulation on MVS. Develop and simulate MGS equations including slow malfunction logic. Complete documentation of software is required. An n-dimensional search and optimization program with inequality constraints is required. Coordinate software development with program office and contractor personnel.
o Special Studies	0.7 (18)	Evaluation and simulation of contractor-conducted analyses.
o Safety	3.1 (20)	Determination of launch abort boundaries and crew safety procedures. Preparation of data showing the insertion conditions that will satisfy abort criteria and mission constraints. Investigation of the fuel-optimal low-thrust elliptical orbit transfer problem with directional control and coasting arcs as applied to MOL abort trajectories. Development of an algorithm to determine when a satisfactory orbit has been achieved by low-thrust application.

GUIDANCE DYNAMICS DEPARTMENT (CONTINUED)

SCH/10/WE

<u>TASK</u>	<u>MTS LEVEL (J.O.)</u>	<u>DESCRIPTION</u>
o Crab Angle Initialization	0.4 (30)	Development of a simple technique for initializing the "crab angle" calculation formulas during the orbital mission.
o Mission Analysis	0.7 (45)	Perform various mission analyses involving orbit selection and sustenance. Support technical direction of contractor test plans for AVE software, validation and verification.
o Short Term Planning	2.6 (4416)	Perform a storage orbit sustenance study. Generate orbit sustenance data for a wide spectrum of initial Q values, orbit inclinations, W/CDA's, launch dates and mission durations. Conduct analytic studies of performance of augmentation subsystems for mission enhancement. Determine the effect of small angles of attack on orbit sustenance.

SCHNEIDER

REQUESTED TASKS NOT SUPPORTED

<u>TASK</u>	<u>MIN. REQUIRED MTS (JO)</u>	<u>DEPARTMENT</u>	<u>COMMENTS</u>
o Alpha Subsystem	1.50 (18)	CSD ₁ /EMD	Stability/performance analysis, noise, component performance, review of specs., etc.
o Beta Subsystem	1.50 (18)	CSD ₁ /EMD	Augment current studies; complete system analysis, errors, noise, dynamics; anomalous input study; closed loop performance.
o Drive A	1.00 (18)	CSD ₁ /EMD	Expand present simulation to include resonant modes; study friction model for behavior when starting from zero; review next design.
o Sensors	0.50 (18)	CSD ₁ /EMD	Analysis of system; noise; component review and TD.
o Beta Update	1.00 (18/28)	SND/GDD	Study optimum use of beta sensor data.
o End-to-End Calibration	0.50 (18)	SND	In house simulator development.
o Simulation	0.50 (47) 0.75 (47)	EMD EMD	Mission simulator stability analysis and evaluation.
o Software Orbital & AVE	?	CSD ₂	Additional manpower requested on current tasks.
o Orbital Uncertainty	0.50 (47)	CDD	Determine effects of orbital uncertainty on the relative trajectory between two spacecraft.
o ΔV Requirements	0.50 (4416)	GDD	Comparison of ΔV requirements for single-impulse corrections at specified intervals ("walking perigee" sustenance mode) with standard two-impulse corrections.

SATELLITE NAVIGATION DEPT.
(2.3 MTS)

<u>TASK</u>	<u>MTS LEVEL (J.O.)</u>	<u>DESCRIPTION</u>
o On-Board LGA Algorithms	0.7 (18, 45)	Study, TD and refine candidate algorithm for on-board ephemeris correction using LGA data.
o Drag Error Definition	0.45 (18)	Define limits of force model (drag) error to be corrected by on-board algorithm. Nearly complete.
o Attitude Determination	0.5 (18)	Simulation of attitude determination algorithms to determine effects of items such as instrumentation errors, integration step size, etc.
o LOGACS LGA Testing	0.7 (45)	Test ground based and on-board LGA algorithms using LOGACS data (shared with 4113-04).

SCHIEWE

CONTROL SYSTEMS DEPT.
(3.25 MTS)

<u>TASK</u>	<u>MTS LEVEL (JO)</u>	<u>DESCRIPTION</u>
o Gemini B Validation	1.0 (15)	Scientific validation of on-orbit navigation, re-entry, and retrograde time prediction. Backup to MAC.
o MEDS	1.0 (18)	Scientific simulation of a subset of airborne CPC's.
o Equations Engineering Notebook	1.0 (18)	Discusses airborne equations from a systems point of view--overall configurations, coordinate frames, rationale, etc.
o ACTS	0.25 (30)	Control system stability study for body bending effects--possible chatter instability in high-gain mode.

COMPUTER SYSTEMS DEPT.
(6.0 MTS)

L. H. HOSKIN

<u>TASK</u>	<u>MTS LEVEL (JO)</u>	<u>DESCRIPTION</u>
o ADC Reconfiguration	1.0 (45)	In event of airborne computer failure, determine methods to restore it to an operational status and assess degradation of system effectiveness for each configuration.
o AGE for AVE Checkout	0.5 (22)	AVE checkout including hardware and software. Evaluate and monitor contractor's proposals and efforts.
o LM and MPSS AGE	1.5 (25)	Support design, test and integration of LM and MPSS AGE (ASTEAG and CITE). Design reviews, evaluations, and concepts of AGE, including interfaces and software.
o MOL/MCC Displays	0.5 (43)	Review adequacy of ADS displays to meet MOL requirements. Evaluate back room display generation and general display initiation. SDC/TRW systems interfaces.
o Data Base Management/ Operating System Review	0.5 (42)	Evaluate proposed requirements and design of the ATSC software. Assess data base alternatives and evaluate impact on System II C. System II C interface guidance to the program office for the ground based ascent/re-entry software.
o AOES	0.5 (42)	Evaluation of specific capabilities of AOES computer program. Interface requirements for ascent/re-entry operations.
o Software Testing	0.5 (42)	Assist in preparation of guidelines for contractors in validation and verification of all MOL software. Evaluate contractor proposed test plans and configuration to determine adequacy of software testing.

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COMPUTER SYSTEMS DEPT. (CONTINUED)

TASK

o Mission Simulator

MTS LEVEL (GO)

1.0 (47)

DESCRIPTION

GSE support with emphasis placed on digital hardware, related computer programs and the interface with the SCF. Detailed design is evaluated with respect to the simulator operational objectives.

D

2. MMR DAC

SIGNAL DETECTION & PROCESSING DEPT.
(0.85 MTS)

<u>TASK</u>	<u>MTS LEVEL (N.O.)</u>	<u>DESCRIPTION</u>
o Lab Antennas and Tracking Equipment	0.35 (25)	Project engineer to provide TD to DAC on development of S-band LAB Antenna System. Provide technical support on request to the Data Systems Office, Engineering Directorate.
o Tracking Operations Support	0.20 (42)	Provide technical support on request to the Flight Operations Office, Operations Directorate. Revise and update "MOL Ascent Support Summary" as required.
o RFTS	0.30 (52)	Support interface definition and overall system definition of WTK Radio Frequency Transmission System. This is a communication system which relays tracking and telemetry data for pre-launch checkout and early flight support.
o SCF-MOL Secure Voice Link Interface	[0.40 (4110)]	Support interface definition activities for secure voice link between STC and the MOL vehicle. This work is supported by ASCD.

COMMUNICATIONS DEPT.
(7.6 MTS)

L. HIRSCHL

TASK	MTS LEVEL (JO)	DESCRIPTION
Gemini-B Abort Separation Test Instrumentation	1.0 (15)	Review the instrumentation and telemetry requirements of the Gemini-B Abort Separation Test.
Higher Data Rate Recovery	0.3 (25)	Study the problems associated with implementing higher data rates.
Monitor Alarm System Simulation	0.5 (25)	Simulate the MOL monitor alarm system in the laboratory. Test the system for various voice/ alarm ratios.
MDAU Operability Determination	0.9 (25)	Review the MDAU with respect to the capability on orbit with emphasis on determination of workability in actual practice. Study related telemetry requirements.
Ascent Communication Interface	0.9 (42)	Assist in the definition, documentation, and systems engineering of the ascent communication interface between AFWTR and AFSCF.
MOL ADS Interface	0.5 (45)	Define the MOL ADS interface requirements, especially for the downlink data modes.
Comm Between STC and ADC	1.5 (45)	Determine the communications capabilities between ADC and the STC to satisfy the MOL requirements. Investigate the present communications between these two agencies.
PCM Bit Synchronizer	1.0 (25)	If more than 10 bits between transitions, bit synchronizer drop-out. MOL currently expects 80 to 100 bits between transitions.
High Data Rates Between STC and RTS	1.0 (45)	Investigate feasibility of 9600 bit communication on 2400 bit lines. New terminal devices necessary using multi-level coding.

L. AIRBORNE

COMPUTER SYSTEMS DEPT.
(6.0 MTS)

<u>TASK</u>	<u>MTS LEVEL (JO)</u>	<u>DESCRIPTION</u>
ADC Reconfiguration	1.0 (45)	In event of airborne computer failure, determine methods to restore it to an operational status and assess degradation of system effectiveness for each configuration.
AGE for AVE Checkout	0.5 (22)	AVE checkout including hardware and software. Evaluate and monitor contractor's proposals and efforts.
LM and MPSS AGE	1.5 (25)	Support design, test and integration of LM and MPSS AGE (ASTEC and CITE). Design reviews, evaluations, and concepts of AGE, including interfaces and software.
MOL/MCC Displays	0.5 (43)	Review adequacy of ADS displays to meet MOL requirements. Evaluate back room display generation and general display initiation. SDC/TRW systems interfaces.
Data Base Management/ Operating System Review	0.5 (42)	Evaluate proposed requirements and design of the ASTC software. Assess data base alternatives and evaluate impact on System II C. System II C interface guidance to the program office for the ground based ascent/re-entry software.
AOES	0.5 (42)	Evaluation of specific capabilities of AOES computer program. Interface requirements for ascent/re-entry operations.
Software Testing	0.5 (42)	Assist in preparation of guidelines for contractors in validation and verification of all MOL software. Evaluate contractor proposed test plans and configuration to determine adequacy of software testing.