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BIF-107-50146-69

Copy 2 of 3

Pages: 54

LAST QUARTER FY 69 AND FY 70
MANPOWER REVIEW
ENGINEERING DIRECTORATE
MOL DIVISION

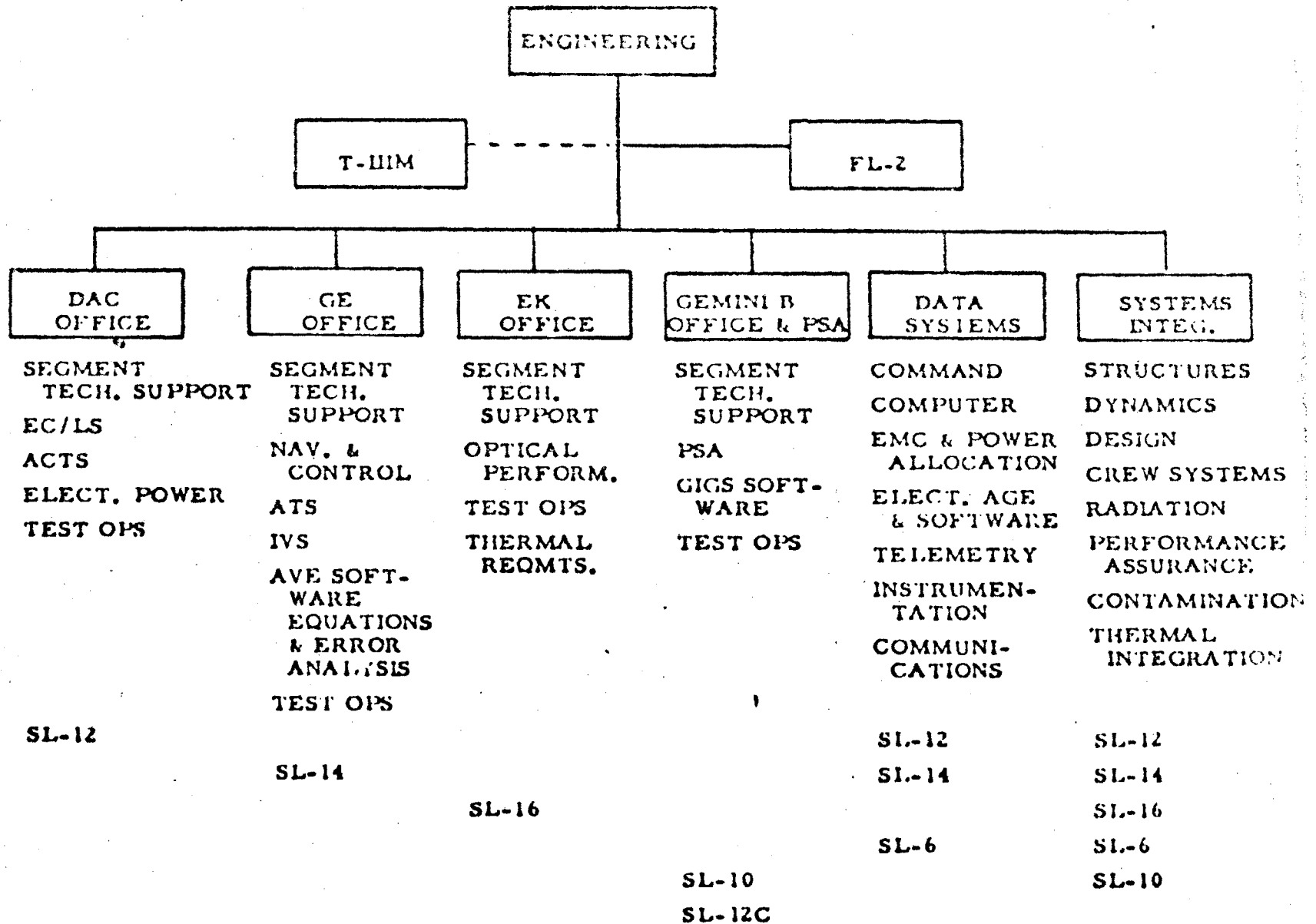
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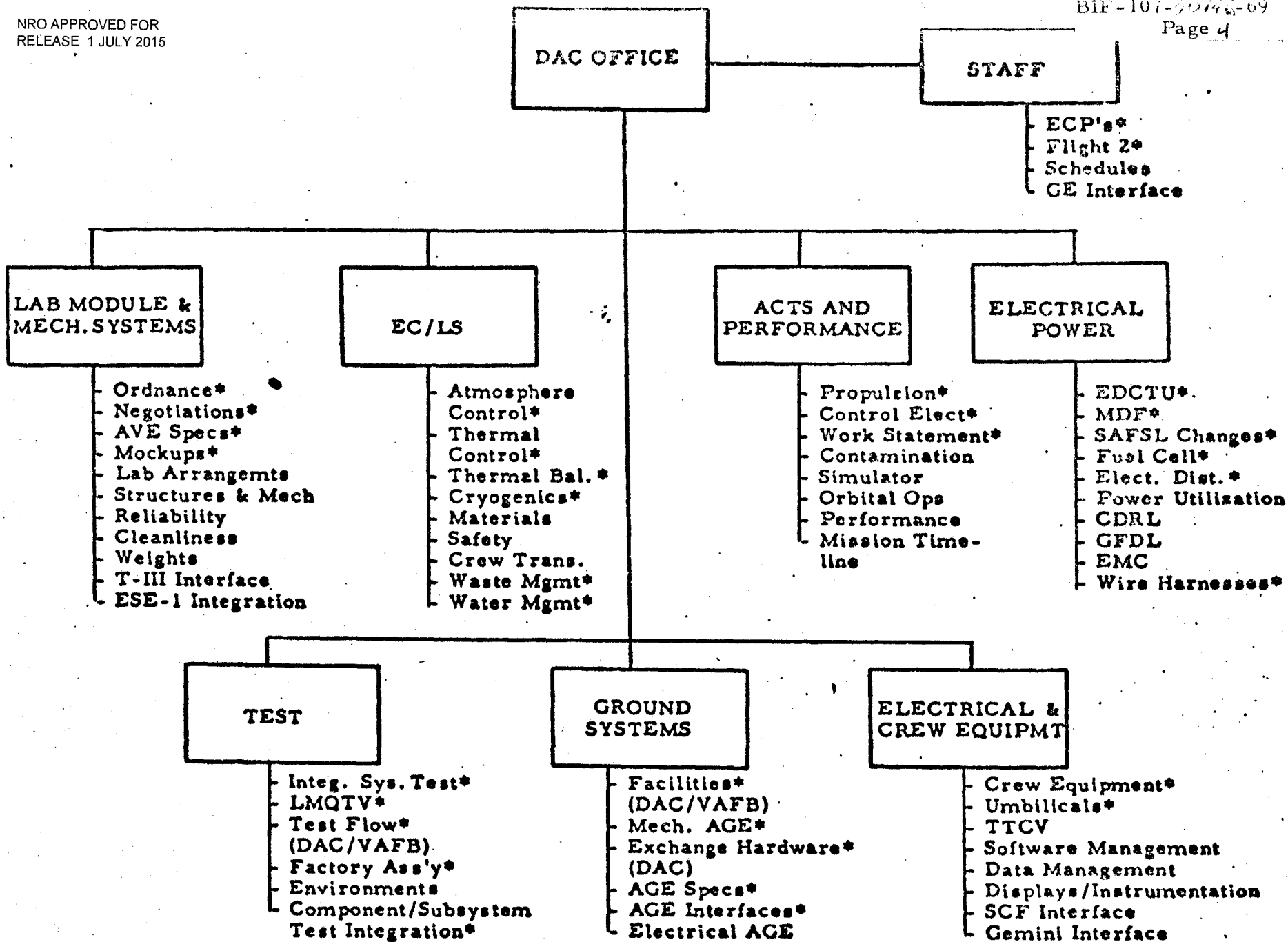
HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

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APPROACH AND GROUND RULES

- o BREAKOUT OF MANPOWER TO SPECIFIC SCHEDULE EVENTS
 - SYSTEM LEVEL TEST
 - SUBSYSTEM TESTS
 - CRITICAL COMPONENTS
 - PDR'S, CDR'S, FACI ACCEPTANCES AND CDRL SUBMITTALS SUCH AS: PERFORMANCE REPORTS, TEST PROCEDURES, TEST RESULTS, ETC.
- o SMALL CONTINGENCY LEVEL CARRIED FOR PROBLEM RESOLUTION
- o MANPOWER SHOWN INCLUDES BOTH PROGRAM OFFICE AND TECHNICAL SUPPORT
 - OVERALL SPLIT IS 60% PO; 40% SUPPORT
 - SPLIT VARIES BY TASK
- o NO AUTOMATIC VERSION WORK INCLUDED





*PRIME RESPONSIBILITY

FY 70 MANPOWER

LABORATORY VEHICLE OFFICE

ORGANIZATION	FY 69	FY 70									
	A M J	J A S	O N D	J F M	A M						
GENERAL	7.5	8.5	9.0	9.3	9.0						
LM & MECHANICAL SYSTEMS	4.3	5.0	4.2	3.0	3.3						
ACTS AND PERFORMANCE	7.2	8.2	8.3	8.3	8.3						
ELECTRICAL POWER	5.1	5.9	8.2	7.5	7.5						
EC/LS	6.9	8.4	9.3	9.4	9.5						
GROUND SYSTEMS	7.0	7.3	8.0	8.0	8.0						
SYSTEM TEST	6.0	6.0	6.5	7.6	6.8						
ELECTRONICS & CREW SYSTEMS	2.5	2.7	3.1	3.2	3.4						
TOTAL AVERAGE MANNING LEVEL	46.5	52.0	56.6	56.3	55.8						

FY 70 MANPOWER

EC/LS

TASK	FY 69		FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
<u>EC/LS SUBSYSTEM</u>													CDR	△
BASIC DESIGN REVIEW	.5			.5			.5			.5			.5	
SUSTAINING DESIGN REVIEW														.2
CEI VERIFICATION EVALUATION										.5				.5
CEI PART II SPEC. REVIEW														.5
CDR PLANS, REVIEWS & ACTIONS												.3		.3
INTERFACE ACTIVITY SUPPORT	.5			.5			.5			.5				.2
PROBLEM AREA RESOLUTION	1.0			1.0			1.0			1.0				1.0
AVERAGE MANNING LEVEL	2.0			2.0			2.0			2.6				2.8

FY 70 MANPOWER

EC/LS

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
<u>EC/LS TEST MODULE</u>															
TEST CONF. DESIGN COMPLETE		△													
HARDWARE DELIVERY:															
WASTE MANAGEMENT SYS.								△							
THERMAL CONTROL SYS.						△	△								
ENVIRONMENTAL CONTROL SYS.								△							
TEST CONTROL DWG. REVIEW				.5	.5		.7								
TEST EQUIP. DESIGN REVIEW						.4	.4			.4					
TEST HWD. (AVE) DESIGN REVIEW						.2	.4								
TEST PROCEDURE REVIEW										.7				1.0	
MONITOR TEST MODULE ASSY.								.4		.4				.6	
MONITOR SUBSYSTEM CHECKOUT															.5
AVERAGE MANNING LEVEL				.2		.9		1.9		1.5				1.6	

EC/L3

TASK	FY 69	FY 70				
	A M J	J A S	O N D	J F M	A M J	
<u>ENVIRONMENTAL CONTROL SYSTEM</u>	CDR Δ					FACI Δ
BASIC DESIGN REVIEW	.8					
CDR SUPPORT	.1	.1				
SUSTAINING DESIGN REVIEW		.3	.3	.3	.3	.3
TRS VERIFICATION EVALUATION	.1	.3				
DEVELOPMENT TESTS REVIEW	.2	.1				
QUALIFICATION TESTS REVIEW		.7	.9	.9		
ACCEPTANCE TESTS REVIEW				.3	.3	
FACI SUPPORT					.1	
AVERAGE MANNING LEVEL	1.0	1.4	1.2	1.2	0.7	

TASK	FY 69			FY 70										
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
<u>THERMAL CONTROL SYSTEM</u>														△CDR
BASIC DESIGN REVIEW		.6			.6			.5			.5			.5
SUSTAINING DESIGN REVIEW														.3
DEVELOPMENT TEST		.6			.6									
QUALIFICATION TEST							.5	.5		.5				.6
ACCEPTANCE TEST								.1		.1				.2
TRS VERIFICATION									.1	.1				.3
CDR SUPPORT											.1			.6
FACI SUPPORT (SUBASSEMBLIES)						.1		.1						
AVERAGE MANNING LEVEL														
		1.2			1.3			1.1		1.2				1.7

NRO APPROVED FOR
RELEASE 1 JULY 2015

EC/LS

TASK	FY 69	FY 70					
	A M J	J A S	O N D	J F M	A M J		
<u>ATMOSPHERE/REACTANTS SUPPLY SYSTEM</u>			CDR Δ			FACI Δ	
BASIC DESIGN REVIEW	.6	.6	.6				
SUSTAINING DESIGN REVIEW				.4	.4		
DEVELOPMENT TEST (MSK)	.3	.4	.4				
DEVELOPMENT TEST (SACTO)				.1	.3	.5	
QUALIFICATION TEST (MSK)				.1	.2	.1	
QUALIFICATION TEST (SACTO)						.2	
ACCEPTANCE TEST				.1	.2	.2	
TRS VERIFICATION				.1	.1	.1	
CDR SUPPORT				.1	.1	.1	
FACI SUPPORT						.1	
AVERAGE MANNING LEVEL	.9	1.1	1.3	1.3	1.4	1.4	

FY 70 MANPOWER

EC/LS

TASK	FY 69		FY 70											
	A	M J	J	A	S	O	N	D	J	F	M	A	M	J
	<u>WASTE MANAGEMENT SYSTEM</u>					CDR Δ								
BASIC DESIGN REVIEW	.4		.4		.4									
CDR SUPPORT					.1		.3							
SUSTAINING DESIGN REVIEW							.2		.2					.2
TRS VERIFICATION EVALUATION	.1		.3		.3		.3							
DEVELOPMENT TESTS REVIEWS	.3		.3		.2									
QUALIFICATION TESTS REVIEWS							.1		.6			.3		
ACCEPTANCE TESTS REVIEWS														.2
FACI SUPPORT														.2
AVERAGE MANNING LEVEL	0.7		1.0			1.1			0.9			0.6		

EC/LS

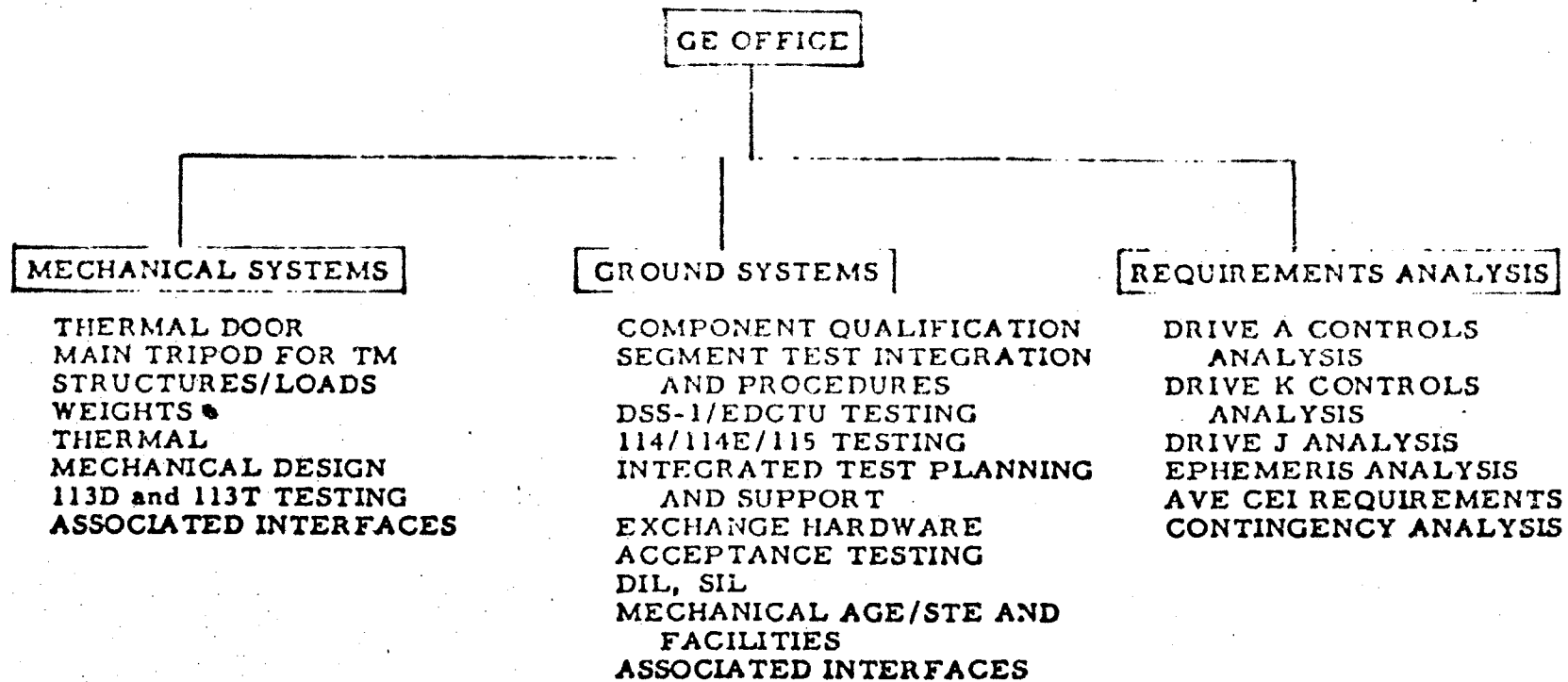
TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
<u>PROJECT FUNCTION</u>															
SAFSL CHANGE REV. & ACTION	.1			.1			.1			.1			.1		
CDRL/GFDL CHG. REV. & ACTION	.1			.1			.1			.1			.1		
CREW TRANSFER MONITOR	.1			.1			.1			.1			.1		
SAFETY REVIEW SUPPORT	.2			.2			.2			.2			.2		
NON METALIC MATERIAL REVIEW	.2			.2			.2			.2			.2		
AVERAGE MANNING LEVEL	.7			.7			.7			.7			.7		

EC'S PROBLEM AREAS

DUMP VALVE FAILURE MODES
WATER DUMP INHIBIT
HUMIDITY CONTROL ASSEMBLY FREEZING
BAY CLOSURES
LOCALIZED CONDENSATION
CATALYTIC BURNER POISONING
SINGLE CHEMISORBENT CANISTER PERFORMANCE
POTABLE WATER CONTAMINATION CONTROL
ASTROVAC PERFORMANCE AND INTERFACES
PLUME IMPINGMENT ON RADIATOR
HEATERS IN ARSS FOR PSA HIGH O₂ FLOW
INCORPORATION OF PLAYER IN TCS
LM FORE AND AFT JOINT HEATING
ESE #1 EFFECTS ON RADIATOR PERFORMANCE

EC/LS SUMMARY

TASK	FY 69	FY 70									
	A M J	J A S	O N D	J F M	A M						
EC/LS SUBSYSTEM	2.0	2.0	2.0	2.6	2.8						
EC/LS TEST MODULE	0.4	0.9	1.9	1.5	1.6						
ENVIRONMENTAL CONTROL SYSTEM	1.0	1.4	1.2	1.2	0.7						
THERMAL CONTROL SYSTEM	1.2	1.3	1.1	1.2	1.7						
ATMOSPHERE/REACTANTS SUPPLY SYS	0.9	1.1	1.3	1.3	1.4						
WASTE MANAGEMENT SYSTEM	0.7	1.0	1.1	0.9	0.6						
PROJECT FUNCTIONS	0.7	0.7	0.7	0.7	0.7						
AVERAGE MANNING LEVEL	6.9	8.4	9.3	9.4	9.5						



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TEST DOCUMENTATION REQUIRING APPROVAL

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
DETAILED TEST PLANS FOR MAJOR VEHICLE TESTS - 113D, 113T, DSS-1, 114, 115, 118	3	1	1	2	1	1	1		2	1		1	2	1	1
DETAILED TEST PROCEDURES FOR EACH MAJOR TEST	5/MONTH			10/MONTH			10/MONTH			20/MONTH			20/MONTH		
DETAILED TEST REPORTS FOR EACH MAJOR TEST		1			2				3	2	2	2	1	1	1

AVERAGE MANNING LEVEL

GE OFFICE

STAFF

INTERFACE PROGRAM
ECP/CCN MANAGEMENT
DCP/CDRL MANAGEMENT

FV-2
EFFECTIVENESS
SAFETY
CONTAMINATION
MATERIALS
AVE CEI SECTION 4 VALIDATION
AVE CDR COORDINATOR
AVE CEI PART II COORDINATOR
FY 6 AND 7

NAV AND CONTROL
ELECTRICAL

TM DRIVE ELECTRONICS
TM DRIVE ELECTROMECHANICAL
STARTRACKERS
FLIGHT ALIGNMENT SYSTEM
DOOR DRIVE
ELECTRICAL DISTRIBUTION
PYROTECHNICS
IVS
LOW G ACCELEROMETER
EMI
ASSOCIATED TESTING
ASSOCIATED INTERFACES

CREW SYSTEMS

ATS DESIGN
ATS DRIVE
CREW RESTRAINTS
CREW DISPLAYS & CONTROLS
VDP
ASSOCIATED TESTING
ASSOCIATED INTERFACES

SYSTEMS ANALYSIS

AVE SOFTWARE EQUATIONS
HARDWARE/SOFTWARE IF
AVE EQUATIONS VALIDATION
ERROR ANALYSIS
PERFORMANCE ANALYSIS

FY70 MANPOWER

GE OFFICE SUMMARY

TASK	FY 69	FY 70				
	A M J	J A S	O N D	J F M	A M	
DIRECTOR AND STAFF	4.5	4.7	5.0	6.0	6.0	
NAVIGATION & CONTROL SECTION	11.2	15.1	16.4	15.8	16.0	
CREW SYSTEMS SECTION	3.6	4.9	5.1	4.2	4.2	
SYSTEMS ANALYSIS SECTION	9.3	11.7	12.5	12.0	12.0	
REQUIREMENTS ANALYSIS SECTION	3.4	4.1	4.5	4.5	4.5	
GROUND SYSTEMS SECTION	4.6	5.7	6.1	6.7	6.3	
MECHANICAL SYSTEMS SECTION	1.3	1.8	1.9	1.4	1.3	
AVERAGE MANNING LEVEL	37.9	48.0	51.5	50.6	50.3	

FY70 MANPOWER

NAVIGATION AND CONTROL SECTION
TM DRIVE ELECTRONICS

TASK	FY 69			FY 70										
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
CDR														
PROBLEM RESOLUTION														
DC-1 TESTS														
MONITOR TESTS & EVALUATE RESULTS														
DSS-1 TESTS														
REVIEW PLANS														
MONITOR TESTS & EVALUATE RESULTS														
114 TESTS														
REVIEW PLANS														
MONITOR TESTS & EVALUATE RESULTS														
115 TESTS														
REVIEW PLANS														
MONITOR TESTS & EVALUATE RESULTS														
AVERAGE MANNING LEVEL														

FY70 MANPOWER

NAVIGATION AND CONTROL SECTION
TM DRIVE ELECTROMECHANICAL

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
CDR			3.0	3.0	△										
IN-HOUSE BEARING & TORQUER TESTS	1.8			2.5			2.5								
PROBLEM RESOLUTION	1.0			1.0			1.0			1.0				1.0	
DC-1 AND COMPONENT TESTS	<i>ENG.</i> △		△	<i>TORQUERS</i> △			<i>CLARINGS</i>			<i>PODUNG GYM</i> △					△
MONITOR TESTS & EVALUATE RESULTS	.3			1.0			1.0			1.5				1.5	
DSS-1 TESTS			△												△
REVIEW PLANS						1.0									
MONITOR TESTS & EVALUATE RESULTS	.3						3.5			4.5				4.5	
114 TESTS										△					△
REVIEW PLANS							.5								
MONITOR TESTS & EVALUATE RESULTS										1.0				1.0	
115 TESTS															△
REVIEW PLANS														1.0	
MONITOR TESTS & EVALUATE RESULTS															1.0
VENDOR ACCEPTANCE & DELIVERY					△	△		△	△	△	△	△	△	△	
					.5			.5		.5		.5			
AVERAGE MANNING LEVEL	4.4			8.0			8.5			8.5			9.0		

NAVIGATION AND CONTROL SECTION

IVS

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
IVS PDR'S AND CDR'S		△		△		⊙		⊙		⊙					
		.5			.5			.2			.2				
ANALYSIS OF REQUIREMENTS AND INTERFACE SUPPORT		1.6			1.1			1.0			1.0			1.0	
PROBLEM RESOLUTION		.8			.8			.8			.8			.8	
IVS TESTER PROGRAM		.5			.2										
DSS-1 TESTING						△				△					
TEST PLAN REVIEW					.2										
MONITOR TESTS & EVALUATE RESULTS								.4			.4				
114 TESTS										△				△	
TEST PLAN REVIEW								.2							
MONITOR TESTS & EVALUATE RESULTS											.4			.4	
115 TESTS															△
TEST PLAN REVIEW														.2	
MONITOR TESTS & EVALUATE RESULTS															.2
VENDOR ACCEPTANCE CRITERIA REVIEW								.2							

AVERAGE MANNING LEVEL

3.6

2.8

2.8

2.8

2.6



VENDOR PDR



GE PDR



VENDOR CDR



GE CDR

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FY70 MANPOWER

NAVIGATION AND CONTROL SECTION
FLIGHT ALIGNMENT AND REFERENCE SYSTEM (LGA, STARTRACKER, FAMS)

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
FARS DESIGN REVIEWS (CDR)	.3			.2											
ANALYSIS OR REQUIREMENTS AND INTERFACE SUPPORT	.8			.8			.8			.8			.6		
PROBLEM RESOLUTION	.5			.5			.5			.5			.5		
VENDOR FACI AND ACCEPTANCE				2			.3						.3		
DCI TESTS	.1			.1											
MONITOR TESTS & EVALUATE RESULTS										.3					
DSS-1 TESTS	.2														
REVIEW PLANS															
MONITOR TESTS & EVALUATE RESULTS				.2			.3			.3					
114 TESTS															
REVIEW PLANS							.2								
MONITOR TESTS & EVALUATE RESULTS										.3			.3		
115 TESTS															
REVIEW PLANS													.2		
MONITOR TESTS & EVALUATE RESULTS													.3		
AVERAGE MANNING LEVEL	1.7			1.9			2.0			1.9			1.9		

FY70 MANPOWER

NAVIGATION AND CONTROL SECTION
THERMAL DOOR DRIVE

TASK	FY 69	FY 70								
	A M J	J A S	O N D	J F M	A M J					
CDR			.4							
PROBLEM RESOLUTION	.3	.3	.3	.3	.3	.3				
DC-1 TESTING										
REVIEW TEST PLANS	.2									
MONITOR TESTS & EVALUATE RESULTS		.2								
DSS-1 TESTS										
REVIEW TEST PLANS	.2									
MONITOR TESTS & EVALUATE RESULTS		.2								
114 TESTS										
REVIEW TEST PLANS						.2				
MONITOR TESTS & EVALUATE RESULTS							.2			
115 TESTS										
REVIEW TEST PLANS									.2	
MONITOR TESTS & EVALUATE RESULTS										.2
AVERAGE MANNING LEVEL	.5	.8	1.0	.6	.9					

FY70 MANPOWER

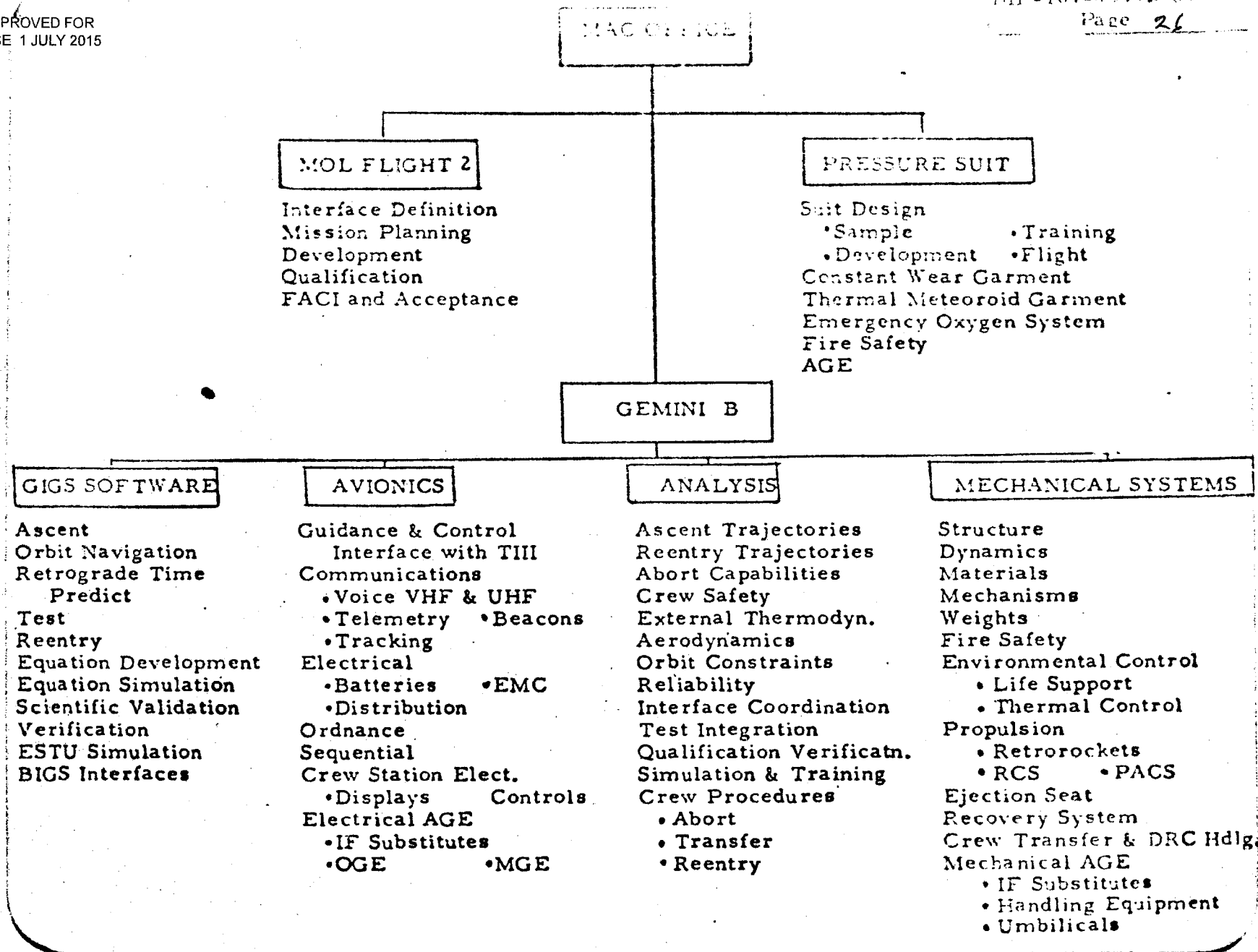
NAVIGATION AND CONTROL SECTION
ELECTRICAL POWER AND SIGNAL DISTRIBUTION

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
EP&SD CDR								.2	△						
INTERFACE SUPPORT	.1				.1			.1			.1			.1	
PROBLEM RESOLUTION	.1				.1			.1			.1			.1	
DC-1 TESTS				△					△						
MONITOR TESTS & EVALUATE RESULTS					.1			.1							
DSS-1 TESTS				△						△					
REVIEW PLANS	.2														
MONITOR TESTS & EVALUATE RESULTS					.2			.2		.2					
114 TESTS										△				△	
REVIEW PLANS									.2						
MONITOR TESTS & EVALUATE RESULTS										.2				.2	
115 TESTS														△	
REVIEW PLANS													.2		
MONITOR TESTS & EVALUATE RESULTS														.2	
AVERAGE MANNING LEVEL					.3			.5		.7			.5		.6

FY70 MANPOWER

NAVIGATION AND CONTROL SECTION SUMMARY

TASK	FY 69			FY 70										
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
TM DRIVE ELECTRONICS		.7		1.1			1.4			1.5			1.0	
TM DRIVE ELECTROMECHANICAL		4.4		8.0			8.5			8.5			9.0	
IVS		3.6		2.8			2.8			2.8			2.6	
FLIGHT ALIGNMENT AND REFERENCE (LGA, STARTRACKER, FAMS)		1.7		1.9			2.0			1.9			1.9	
THERMAL DOOR DRIVE		.5		.8			1.0			.6			.9	
ELECTRICAL POWER & DISTRIBUTION		.3		.5			.7			.5			.6	
AVERAGE MANNING LEVEL				11.2			15.1			16.4			15.8	16.0



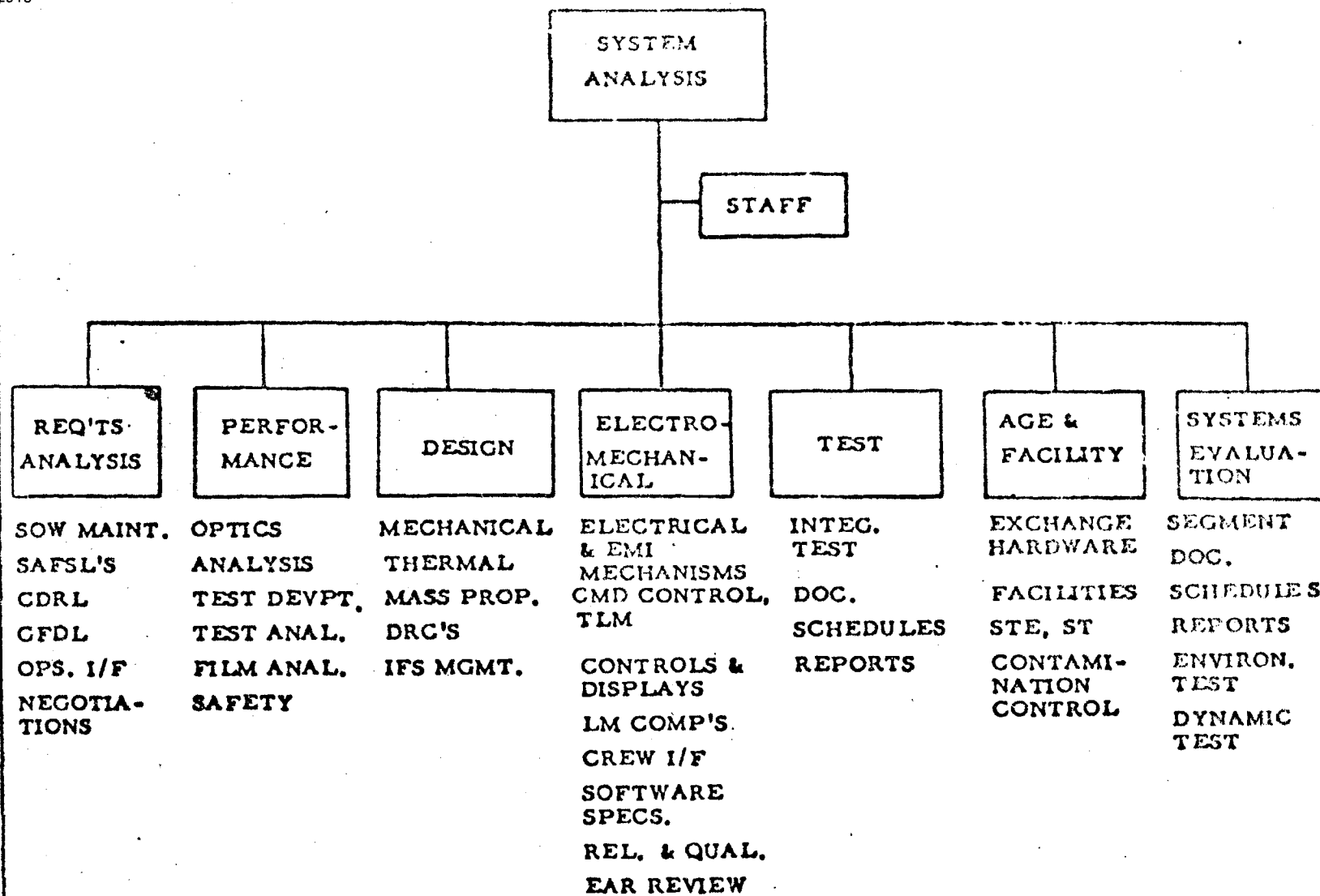
FY 70 MANPOWER

GIGS SOFTWARE

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
ASCENT GUID. EQUAS. DEVELOP. & SIMULATION	2.4			2.1			1.6			1.0			.35		
ORBIT ADJUST EQUAS. (MODE D)															
TARGETING EQUAS.															
DISPLAYS SUPPORT															
SCALING & RANGE OF VALUES SPEC.															
DEVELOP. & MAINTENANCE OF SIMULATION															
DOCUMENTATION															
RE-ENTRY MODULE EQUATIONS SIM.	.9			.9			.9			.9			.9		
SIMULATION COMPATIBILITY WITH MDAC-ED															
MONITOR MDAC-ED DEVELOP.															
DEVELOP. & MAINTENANCE OF SIMULATION															
CENTRAL & TEST MODULE EQUAS. MONITORING	.2			.2			.2			.1			.1		
MONITOR MDAC-ED DEVELOP.															
ASCENT GUID. EQUAS. SCIENTIFIC VALIDATION	.2			.5			1.0			1.6			2.25		
ASCENT STEERING															
ASCENT ABORT															

FY 70 MANPOWER
GIGS SOFTWARE (CONT'D)

TASK	FY 69			FY 70												
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	
ORBIT ADJUST																
SWITCHOVER																
SIMULATION SUPPORT																
SIMULATION CHECKOUT																
CENTRAL & TEST MODULE EQUAS. VALIDATION MONITORING	.1			.1			.1			.2			.2			
FLIGHT PROGRAM VALIDATION (DEV. OF ICS)	.5			.5												
OPERATIONS PLANNING SUPPORT MCC & VAFB - GBPS	.2			.2			.2			.2			.2			
CREW SAFETY SUPPORT	.1			.1			.1			.1			.1			
T3 INTERFACE ACTIVITY	.1			.1			.1			.1			.1			
ESTU, SST SOFTWARE	.1			.1			.1			.1			.1			
PROBLEM AREA RESOLUTION	.25			.25			.25			.25			.25			
TI & TD MTGS, DESIGN REVIEWS	.35			.35			.35			.35			.35			
CCB & IFS	.1			.1			.1			.1			.1			
MDAC-ED DOCUMENT REVIEWS																
PDR - VOL II	▲															
CDR - VOL II					▲											
CDR - VOL IV									▲							
AVERAGE MANNING LEVEL	5.5			5.5			5.0			5.0			5.0			



SYSTEM ANALYSIS

TASK	FY 69	FY 70					
	A M J	J A S	O N D	J F M	A M J		
REQUIREMENTS ANALYSIS	3.5	4.9	3.7	1.4	1.4		
PERFORMANCE (OPTICS & SAFETY)	6.0	5.7	4.6	6.0	5.3		
DESIGN (MECHANICAL & THERMAL)	6.5	6.3	6.2	5.2	5.3		
ELECTROMECHANICAL	5.7	6.5	6.0	6.9	6.3		
TEST (INTEGRATED TESTING)	4.9	4.9	5.7	6.0	6.1		
AGE & FACILITIES	2.2	2.2	2.3	2.3	2.2		
SYSTEM EVALUATION	5.6	6.4	6.4	6.2	7.6		
AVERAGE MANNING LEVEL	34.9	37.7	35.4	34.5	34.8		

PERFORMANCE

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
OPTICS ANALYSES															
PERFORMANCE PREDICTION RPT.	.2			1.0			.2			1.0			.2		
SMEAR ANALYSIS	1.0			.5						.5			.5		
FLARE ANALYSIS	.5			.5											
CONTAMINATION ANALYSIS	.2			.5			1.0			.5			.2		
EXPOSURE TIME IMPACT	.2														
DESIGN IMPROVEMENT STUDIES	.2			.2			.2			.2			.2		
OPTICS - TEST DEVELOPMENT															
TEST PROCEDURES REVIEW	1.0			.2			.2			.2			.2		
TEST EQUIPMENT ACCY. ANALYSIS	1.0			1.0			.2			.2			.2		
DATA REDUCTION & INTERPRETATION					.2		1.0			1.0			.5		
TEST ANALYSIS															
COMPONENT	.2						.2			.5			.5		
OAT	.2			.5			1.0			.5					
FLARE MODEL	.5														
ENGINEERING MODEL				.3			.3			.3			1.0		
AVERAGE MANNING LEVEL															

PERFORMANCE (CONT'D)

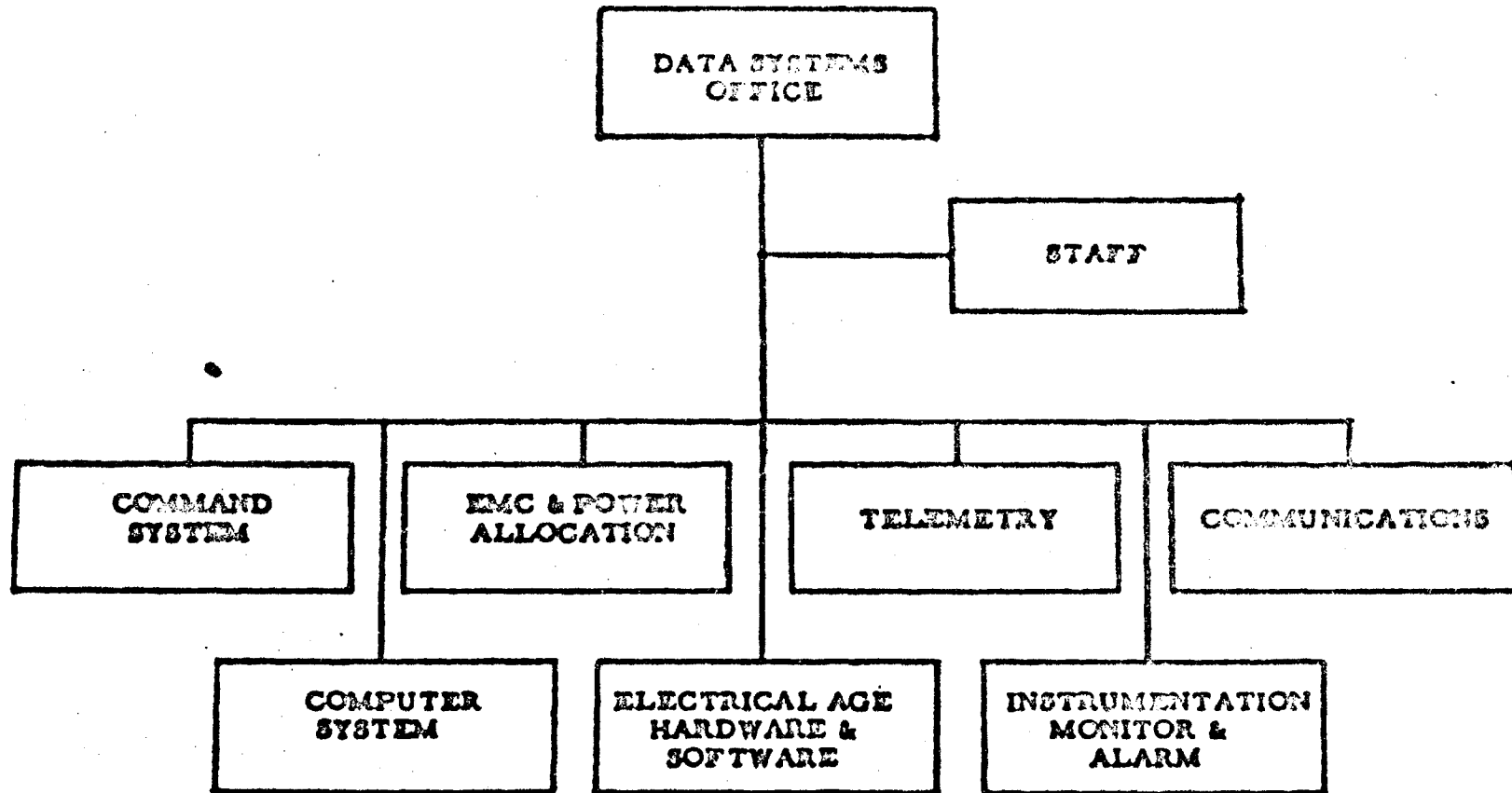
TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
TEST ANALYSIS (CONTINUED)															
• QUAL. MODEL											.5			.5	
FM-1											.5			1.0	
FILM ANALYSES	.1			.1			.1			.1				.1	
SAFETY*															
SURVEILLANCE & REVIEW OF CONTRACTOR ANALYSES	.2			.2			.2			.2				.2	
NON-METALLIC MATERIALS	.5			.5											
SEGMENT EFFORT ONLY - SAFETY OFFICE MANPOWER NOT INCLUDED															
AVERAGE MANNING LEVEL PERFORMANCE	6.0			5.7			4.6			6.0				5.3	

FY 70 MANPOWER

GEMINI B

PSA & FV-2

ORGANIZATION	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
GEMINI B															
GIGS SOFTWARE	5.5				5.5		5.0			5.0				5.0	
AVIONICS	4.5				5.7		6.6			6.1				6.0	
MECHANICAL SYST.	4.0				5.0		5.2			6.1				6.0	
ANALYSIS	2.2				4.0		5.7			5.6				5.5	
PSA	2.2				3.6		4.8			4.9				4.7	
FLIGHT 2	1.0				1.4		1.5			1.6				1.7	
TOTAL AVERAGE MANNING LEVEL	19.4				25.2		28.8			29.3				28.9	



**ELECTRICAL AGE
HARDWARE & SOFTWARE**

**ALL SYSTEMS TEST EQUIPMENT GROUP
(ASTEG)**

SIL CHECKOUT SYSTEM
THERMAL VACUUM CHAMBER
PSIA 1 AND 2
VAFB

CEI TEST SETS

RFI
CIRCUIT MODULE
BIO MED CONSOLE
PHYSIOLOGICAL SEMULATOR
HORIZON SIMULATOR

**MISSION MODULE CHECKOUT SYSTEM
(CITE)**

VALLEY FORGE
PSIA 1 AND 2 (HB)
VAFB

**MISSION MODULE TEST EQUIPMENT
(3 LOCATIONS)**

LM FORWARD INTERFACE ELECTRICAL
SUBSTITUTE (LMFIES)

ALL DAC AND GE ELECTRICAL STE (35
DIFFERENT ITEMS)

CITE TEST SUPPORT COMPUTER PROGRAMS
CITE DIAGNOSTIC AND READINESS
COMPUTER PROGRAM
MMTE TEST SUPPORT COMPUTER PROGRAMS
ASTEG OPERATING COMPUTER PROGRAM
MOLTOL COMPUTER LANGUAGE AND
LANGUAGE COMPILER
AGE WORKING GROUP
TEST INTEGRATION TEAM
AGE-AVE ELECTRICAL INTERFACES
AGE - FACILITY INTERFACES
AGE-AVE PERFORMANCE INTEGRITY
INTEGRATED TEST COMPUTER PROGRAMS
ASTEG-CITE INTERFACES & INTEGRATED
TESTING
ELECTRICAL AGE TO MECHANICAL AGE
INTERFACES

TELEMETRY

- LM PCM REMOTE MULTIPLEXER
- LM PCM CENTRAL UNIT
- LM PCM CONTROL UNIT
- LM PCM DIGITAL RECORDERS
- LM EVENT TIMERS
- VOICE RECORDERS
- TLM ENCRYPTORS
- VEHICLE MASTER TIMING SYSTEM
- LM FM SCO'S
- MM MULTICODER
- MM DIGITAL MUX
- MM ANALOG MUX
- MMFM SCO'S
- FV2 PCM TM (LM & MM)
- DATA ACQUISITION AND TIMING WORKING GROUP
- SUBSYSTEM - TLM INTERFACES
- GB - PCM INTERFACE
- VEHICLE TO GROUND INTERFACE
- TLM SYSTEM PERFORMANCE & INTEGRITY
- ORD & OPERATIONS INTERFACE SUPPORT
- TLM ALLOCATIONS

**INSTRUMENTATION
MONITOR & ALARM**

- LAB MODULE GAS TRANSDUCERS
 - PARTIAL PRESSURE OXYGEN
 - PARTIAL PRESSURE CO₂
 - TOTAL PRESSURE
 - DEW POINT
- LM ENVIRONMENTAL TRANSDUCERS (VIB., ACOUSTICS AND TEMP.)
- MM ENVIRONMENTAL TRANSDUCERS (VIB., ACOUSTIC, TEMP.)
- LM SIGNAL CONDITIONING
- MONITOR AND ALARM (MAS) SUBSYSTEM
- MAS SUBSYSTEM INTERFACES
- LM DISPLAYS AND CONTROLS (EL PANEL LIGHTING, PANEL SWITCHES AND METERS)
- CREW STATUS MONITORING EQUIPMENT
 - HEART INTERVAL MONITORING SYSTEM
 - CHARGED PARTICLE SPECTROMETER
 - ACTIVE BIOLOGICAL DOSIMETER
 - CONTAMINANT GAS SENSOR
- LM SWITCHING ASSEMBLIES
- INSTRUMENTATION, MAS PERFORMANCE & INTEGRITY
- LM INSTR. CONTROLS & DISPLAYS INTERFACE
- MAS & INSTRUMENTATION WORKING GROUP
- FLIGHT VEHICLE 2 ELECTRONICS
- INSTRUMENTATION LIST

**EMC & POWER
ALLOCATION**

- EMC WORKING GROUP
- EMC REQUIREMENT SAFSL 10005
- EMC CONTROL PLAN, SAFSL 20005
- ANALYSIS, TEST REQUIREMENTS & DATA
REDUCTION OF LAUNCH PAD RF ENVIRON-
MENT
- INTERFACE EMC REQUIREMENTS - ALL
SEGMENTS
- EMC EED ANALYSIS AND TEST
- VEHICLE SYSTEM GROUND ANALYSIS
- AGE GROUNDING ANALYSIS
- PROGRAM FREQUENCY MANAGEMENT AND
ALLOCATION
- SWITCHING TRANSIENT ANALYSIS
- INTERFACE SHIELDING ANALYSIS
- CRITICAL TEST POINT ANALYSIS
- ANALYSIS OF EDCTU EMI TEST DATA
- ANALYSIS OF LMQTV EMI TEST DATA
- PLANNING, SUPPORT VAFB EMI TEST,
AND ANALYSIS OF TEST DATA
- EVALUATION OF EQUIPMENT WAIVER
REQUESTS
- WIRING HARNESS SAFSL
- POWER ALLOCATION SAFSL
- POWER QUALITY ANALYSIS
- WIRING PROCEDURES SUPPORT
- OV POWER STATUS REPORTS
- POWER TIME LINE - OPERATIONS INTERFACE
- POWER WORKING GROUP
- INTERSEGMENT CABLING COMPATIBILITY
- CABLING DEVELOPMENT FIXTURE REVIEW

**COMMAND
SYSTEM**

- COMMAND LOGIC UNIT
- LABORATORY DECODERS
- BACKUP COMMAND SYSTEM
- ON-BOARD CONTROLS
- COMMAND DECRYPTORS
- MISSION DATA ADAPTER UNIT
- CONSOLE CONTROLLER
- EXPERIMENT CONTROLLER
- COMMAND-COMPUTER INTERFACES
- COMMAND/VEHICLE SUBSYSTEM INTERFACES
- COMMAND ALLOCATION
- COMMAND DEFINITION SPEC SUPPORT
- COMMAND VEHICLE TO GROUND COMPATIBILITY
- HARDWARE - COMMAND SOFTWARE VALIDATION
- COMMAND SYSTEM PERFORMANCE & INTEGRITY
- COMMAND SYSTEM WORKING GROUP

**COMPUTER
SYSTEM**

- AIRBORNE DIGITAL COMPUTER
- LABORATORY DATA ADAPTER UNIT
- AIRBORNE PRINTER
- COMPUTER SUBSYSTEM CONTROLLER
- AIRBORNE MAGNETIC TAPE UNIT
- KEYBOARD UNIT
- DISPLAY PANEL
- COMPUTER SYSTEM PERFORMANCE RQMTS.
- COMPUTER SYSTEM LM I/F
- COMPUTER SYSTEM - GE SEGMENT INTERFACES
- CORE ALLOCATION ANALYSIS
- COMPUTER SYSTEM PERFORMANCE & INTEGRITY
- AIRBORNE COMPUTER SYS. WKG. GROUP
- AVE COMPUTER EX. HDW.
- COMPUTER SIMULATOR EX. HARDWARE (ADCAS)
- PAM
- PAMAT

COMMUNICATIONS

- TTCV TRANSPONDER
- SIGNAL PROCESSOR
- VOICE CONTROL CENTER
- POWER AMPLIFIER
- ANTENNA & RF TRANSMISSION
- COM. CONTROL PANEL
- FV-2 TRANSMITTER
- SECURE EQUIPMENT
- HIMS TRANSMITTER/RCVR
- COM. CONTROL & SWITCHING ASSY.
- SPACE-GROUND INTERFACE
- MICROPHONE/HEADSET
- LINK COMPUTATIONS
- SGLS COMPATIBILITY TEST
- TEMPEST TEST
- ORD SUPPORT
- COM. SYSTEM QUAL TEST
- VOICE INTELLIGIBILITY
- LM SUBSYSTEM INTERFACES
- GB VHF TRANSCEIVER I/F
- COM SYSTEM PERFORMANCE & INTEGRITY
- COMM. WORKING GROUP

COMMAND SYSTEM - DAG SEGMENT

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
<u>LM FLTS 3, 4, 5</u>															
BASIC DESIGN REVIEW		.2			.2			.1				.1			
SUSTAINING DESIGN REVIEW									.1			.1			
CEI VERIFICATION EVALUATION			.1		.1				.1						
CEI PART II SPEC REVIEW			.1			.1		.2				.1			.2
PROBLEM RESOLUTIONS			.1			.1		.1							.2
INTERFACE ACTIVITY		.2			.2			.2				.2			.2
CDR PLANS, REVIEWS, ACTIONS		.1			.1			.1				.4			.2
<u>LMQTV</u>															
TEST PLAN REVIEW								.1			.1				.2
<u>LAB MODULE FLT 3</u>															
FACTORY ASSEMBLY REVIEW															.2
ACCEPTANCE TEST PLANNING															.2
															DEL
AVERAGE MANNING LEVEL		1.2			1.8			1.0				1.7			2.2

LAB DECODERS - DAG SEGMENT

TASK	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
BASIC DESIGN REVIEW	.2														
SUSTAINING REVIEW															
CEI VERIFICATION EVALUATION															
CEI PART II SPEC REVIEW															
PROBLEM AREA RESOLUTIONS															
INTERFACE ACTIVITY SUPPORT															
CDR PLANS, REVIEWS, ACTIONS															
TRS VERIFICATION EVALUATION															
<u>PROTOTYPE DEVELOPMENT MODEL</u>															
TEST PLAN REVIEW															
TEST SUPPORT															
TEST RESULTS REVIEW															
<u>QUALIFICATION TESTS</u>															
TEST PLAN PROCEDURE REVIEW															
TEST SUPPORT															
TEST RESULTS REVIEW															
ACCEPTANCE TEST REVIEW															
FACI															
AVERAGE MANNING LEVEL	.6			.5			.4			.6			.5		

DATA SYSTEMS OFFICE SUMMARY

ORGANIZATION	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
I. INTEGRATION															
EMC		2.7			2.9			2.7			2.9			2.6	
POWER & WIRING		2.8			3.0			3.0			3.0			3.0	
		<u>5.5</u>			<u>5.9</u>			<u>5.7</u>			<u>5.9</u>			<u>5.6</u>	
II. GE SEGMENT															
TELEMETRY		1.0			1.3			1.7			1.7			1.6	
COMMAND		2.2			2.7			2.6			2.5			2.7	
INSTRU.		.4			.4			.4			.4			.4	
AGE		2.5			4.1			4.4			4.4			4.0	
		<u>6.1</u>			<u>8.5</u>			<u>9.1</u>			<u>9.0</u>			<u>6.7</u>	
III. DAC SEGMENT															
COMMAND		2.7			2.8			2.0			3.0			3.1	
TELEMETRY		2.1			2.5			3.0			3.0			2.9	
INSTRU., DISPLAYS AND CONTROLS		2.2			2.5			2.8			2.6			2.6	
COMPUTER		3.3			3.1			3.2			3.8			4.1	
COMMUNICATIONS		3.1			4.0			4.1			3.5			3.1	
ELECTRICAL AGE		4.5			4.7			5.9			6.1			6.2	
		<u>17.9</u>			<u>19.6</u>			<u>21.0</u>			<u>22.2</u>			<u>22.0</u>	
TOTAL AVERAGE MANNING LEVEL		29.5			34.0			35.8			37.1			36.3	

SYSTEMS INTEGRATION

CREW SYSTEMS	RADIATION PROGRAM	PERFORMANCE ASSURANCE	CONTAMINATION
<ul style="list-style-type: none">o Integrate Crew Equip.<ul style="list-style-type: none">- Human Factors Engr.- Monitor all Crew Equip Interfaces- Establish & Review Human Performance Design Criteria- Provide TD for Integ. Crew Task Analyses- Monitor Flight Crew/ Contractor Crew Surrogates	<ul style="list-style-type: none">o Monitor Active Biologic Dosimeter Design/Testo Monitor Charged Part. Spectrometer Design/Testo Monitor/Review Dose Projection Computer Program (LMCP)o Monitor/Review Anal. Shielding Analysiso Monitor Passive Dosimeters Design/Testo Monitor Solar Flare Event Modelingo Monitor/Review Nuclear Weapons Effectso Monitor MCC Requirements Display/Flight Interfaceo Establish Radiation Damage to Payload/Crew Dose Crit.	<ul style="list-style-type: none">o Monitor/Review Contractor<ul style="list-style-type: none">- Reliability Models and Assessment- Failure Mode/Effects- Contingency Analyses- PLOT- Maintain. Programo Integrate<ul style="list-style-type: none">- SP/DR/SAFSL Exhibitso Responsible for<ul style="list-style-type: none">- System Perf. Assurance	<ul style="list-style-type: none">o Estab. Contam. & Clean. Repts<ul style="list-style-type: none">- AVE- Ground Facilitieso Estab. Design Solutions & Control Procedureso Estab. Sampling & Anal. Techniqueso Monitor Contractors Ground Contam. Control Plano Monitor Anal. & Test Act.<ul style="list-style-type: none">- Determination of allowable levels- Determination of expected levelso Monitor Assoc. Interf. Activityo Support & Participate in Contamination Wkg Grp

SYSTEMS INTEGRATION OFFICE

TASK	FY 1969			FY 1970											
	A	M	J	O	N	D	J	F	M	A	M	J			
<u>STRUCTURES</u>			7.3			10.6			10.6			9.3			9.4
SS "A"			1.6			4.2			3.8			4.5			5.6
SS "B"			.9			1.4			1.2			.7			.7
SS "C"/ALPHA			.7			.8			1.6			.7			.2
INTEGRATION			4.1			4.2			4.0			3.4			2.9
<u>DYNAMICS</u>			4.5			4.0			4.9			5.0			5.4
SS "A"			.5			.5			.5			.7			.6
SS "B"			.3			.3			.6			1.0			.9
SS "C"/ALPHA			.7			.7			.5			.9			.5
INTEGRATION			3.0			2.5			3.3			2.8			3.4
<u>DESIGN/WTS</u>			6.0			7.2			7.2			8.3			7.2
DES			3.3			3.0			4.6			4.6			4.6
WTS			2.7			4.2			2.6			3.7			2.6
<u>PERFORMANCE ASSURANCE</u>			5.0			6.5			6.8			6.0			6.0
RELIABILITY/MAINTAINABILITY			3.0			4.5			4.4			4.0			4.0
SYSTEM PERFORMANCE			2.0			2.0			2.4			2.0			2.0
<u>CONTAMINATION</u>			1.7			2.2			3.0			3.1			3.2
<u>RADIATION</u>			1.5			1.5			1.6			1.6			1.6
<u>CREW SYSTEM</u>			1.0			2.0			2.7			2.7			3.2
<u>THERMAL</u>			2.1			2.3			2.3			2.3			1.8
TOTAL AVERAGE LEVEL			29.1			36.3			39.1			38.3			37.8

FY 1969

FY 1970

K	FY 1969			FY 1970										
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
SUBSYSTEM 'A' SL-12														
a.						.52			.1					
b.									.64		1.0			.37
c.			.2			.2								
d.						.7			.33					
e.			.07			.43			.43		.07			
f.									.2					
g.			.33			.3			.1					
h.			.03			.1			.17		.40			.10
i.											.20			.20
j.														.37
k.											.13			
l.														
m.			.07			.20								
n.						.15			.2					
o.											.17			.07
p.											.07			.47
q.									.17		.07			

K	FY 1969			FY 1970										
	A	M	J	J	A	S	O	N	D	J	F	M	A	M
SUBSYSTEM 'A' (CONT)														
10.												.15		
11.												.10		.30
12.						.33								
13.														.20
14.														.20
15.												.4		.07
16.														.35
17.														.30
18.														.35
19.			.17			.35			.07					
20.						.25			.14					
21.									.27			.25		
<u>SUBTOTAL</u>														
			1.6			4.2			3.8			4.5		5.6
SUBSYSTEM 'B' SL-16														
a.			.07			.13						.15		.10
b.						.25			.20					
c.						.20			.20					

FY 1969

FY 1970

X	FY 1969			FY 1970										
	A	M	J	J	A	S	O	N	D	J	J	M	A	J
SUBSYSTEM 'A' (CONT)														
r.						.15			.24					
s.			.07			.13			.07			.40		.07
t.														.30
u.						.07			.3					
v.			.07			.13			.17			.27		
w.			.13			.13						.27		
x.						.13						.27		
y.												.07		.3
z.												.07		.3
<u>1.</u>			.13			.25								
<u>2.</u>												.07		.3
<u>3.</u>														.3
<u>4.</u>			.27			.15								.2
<u>5.</u>														.2
<u>6.</u>									.13			.07		
<u>7.</u>														.13
<u>8.</u>														.20
						.07			.07					

K	FY 1969			FY 1970							
	A	M	J	O	N	D	J	F	M	A	M
SUBSYSTEM 'B' SL-16 (CONT)											
d. Tech. Reviews			.23			.25			.25		.23
e. SDM2 Vibr. Test								.10		.20	
f. Acoustic Devel. Test			.13			.25		.20			
g. FV-2 Acoustic											.17
h. Math. Model Review			.27			.10		.15		.10	.20
i. Lds. Cycle 4 Impact			.23			.22		.10			
<u>SUBTOTAL</u>			.9			1.4		1.2		.7	.7
SUBSYSTEM 'C' SL-14											
a. CDR								.36			
b. Static Test			.14					.27		.05	
c. Structural Analys. Rev.			.13			.23		.17			
d. TD Meetings			.23			.23		.23		.25	.20
e. 113D Dynamic Test						.10		.25			
f. DSS-1 Test								.07		.40	
g. Lds. Cycle 4 Impact			.23			.24		.25			
<u>SUBTOTAL</u>			.7			.8		1.6		.7	.2

SK	FY 1969					FY 1970								
	A	M	J	J	A	S	O	N	D	J	J	M	A	M
ADDITIONAL TASKS/INTEGRATION														
a.						.20								
b.											.20			
c.						.20								
d.						.13	.07	.20						
e.						.23	.27	.50		.40			.40	
f.						.07	.23	.07						
g.						.5	.48	.50		.50			.50	
h.						.5	.48	.50		.50			.50	
i.						.07	.13	.07		.14			.10	
j.						.27	.25	.10						
k.						.2	.20							
l.						.27	.13	.16		.13				

SYSTEMS INTEGRATION

STRUCTURES

- o Maintain Struct. Design Criteria
SAFSL 10004
- o Maintain Vehicle Loads
SAFSL 10003
- o Review Stress, Dynamic Loads,
Environmental, and Fluid Mechanics
Analyses
- o Chair Loads Working Group Mtg
- o Surveillance/Review/Evaluation
of all Structures Test
- o Support Interface Activity
- o Support PDR's, CDR's, FACI's,
and Struct. Hdwre Acceptance
- o Review Hardware Fab and Conduct
MRB Reviews

DYNAMICS

- o Develop Realistic Vibration Budget
Criteria
- o Coordinate Interchange of Modeling
Data
- o Review Modeling and Dynamics Anal.
- o Chairmanship of the Dynamics Work-
ing Group
- o Provide Direction for all Phases of
Dynamic Testing
- o Assessment/Diagnosis of Dynamic
Performance

DESIGN

- o LM Mech. I/F
 - TSOM's, TEM's, TIM's -
Prepare/Co-Chair
 - Control Lab Arrangements
 - Review IFS's and ICD's
 - Manage Lab Equip. Install/
Access Provisions
 - Manage Lab Space Allocations
 - Conduct Critical Lab Design
Studies/Briefings
- o OV Mass Properties Status
and Control
 - Review/Brief Segment OV/FV
Status
 - Conduct Segment Audits
 - Review AVE ECP's for
Weight Impact
 - Fact Find Changes/Obtain
Contractor Agreement
 - Support CCB
 - Review/Main. CDRs and
SAFSLs
 - Manage OV Cont. Verif./Ops
Support Plan
 - Brief Mgmt. on Status

FY 1969

FY 1970

	A	M	J	J	A	S	O	N	D	J	F	M	A	M
ADDITIONAL TASKS/INTEGRATION (CONT)														
m. OV/THI I/F Meetings SL-12, SL-13			.1		.10			.10			.10			.10
n. DAC/MAC I/F Meetings SL-12			.1		.10			.1			.10			.10
o. SAFSL 10003, 10004, 10012 SL-12, SL-14, SL-16			.5		.30			.60			.30			.30
p. Alignment SL-14			.3		.25			.30			.43			.37
q. Continuing ICN Reviews SL-12, SL-14, SL-16			.3		.30			.30			.30			.30
r. Fact Finding SL-12 (2/3), SL-14 (1/3)			.5		.50			.50			.30			.20
<u>SUBTOTAL</u>			4.1		4.2			4.0			3.4			2.9
<u>MANPOWER TOTALS</u>			7.3		10.6			10.6			9.3			9.5

OVERALL ENGINEERING SUMMARY

ORGANIZATION	FY 69			FY 70											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
GROUP DIRECTOR'OFFICE	2.0			2.0			2.0			2.0			2.0		
GE OFFICE	37.9			48.0			51.5			50.6			50.3		
SYSTEMS INTEGRATION	29.1			36.3			39.1			36.3			37.6		
DAC OFFICE	46.5			52.0			56.6			56.3			55.8		
DATA SYSTEMS	29.5			34.0			35.8			37.1			36.3		
GEMINI B	12.6			20.2			22.5			22.8			22.5		
PSA	2.2			3.6			4.8			4.9			4.7		
FLIGHT 2	1.0			1.4			1.5			1.6			1.7		
SYSTEMS ANALYSIS	34.9			37.7			35.4			34.5			34.8		
TOTAL	195.7			235.2			249.2			246.1			245.7		