This is the manned MOL configuration. Its major elements include the:

CHART 2

1. Gemini B, used as a personnel vehicle during launch, and a recovery vehicle for the astronauts and exposed film.

2. The Laboratory Module, consisting of a pressurized compartment, and an unpressurized service section housing propellants and propulsion system, oxygen, hydrogen, helium, fuel cells, and a tunnel which connects the GEMINI and the pressurized compartment;

3. And the Mission Module which contains the optical assembly. As you will recall, this is a [redacted] focal length frame camera. The earth image is reflected from this six-foot diameter mirror -- which tracks the target continuously during photography -- to another six-foot mirror, to these diagonal mirrors, and then through corrector lenses to the camera.

This spacecraft will weigh about 30,000 pounds and will carry enough expendables for at least 30 days. It will be launched from Vandenberg Air Force Base into polar orbits which will provide photographic access to the entire world.

This is the unmanned version of the MOL. Its major elements include:

CHART 2 Overlay

1. A Support Module, in lieu of the GEMINI B in the manned version, which houses 6-8 film recovery vehicles of the same kind used by present reconnaissance satellites;

2. A Modified Laboratory Module, with the life support and manual controls of the manned version removed;

3. And the same Mission Module -- or optical assembly -- used in the manned version.

The unmanned spacecraft will weigh about 26,000 pounds and is expected to function on-orbit for at least 30 days. Expendables for about 42 days on-orbit lifetime will be carried on initial flights.

There are five major associate contractors involved in the MOL Program:

CHART 3

1. Douglas provides the Laboratory Module and the external structure of the Mission Module which houses the photographic system. Douglas also will physically integrate the major MOL system segments and perform the final launch-readiness tests and checkouts.

2. McDonnell builds the GEMINI B.

3. General Electric provides the control system and structure for the large tracking mirror in the Mission Module, most of the photographic mission-related control equipment in the Orbiting Laboratory, software for mission accomplishment, and data return capsules for the unmanned system.

4. Eastman Kodak is responsible for developing and manufacturing the optical and camera elements. Camera performance will be tested in Eastman Kodak facilities before shipment to the West Coast for final vehicle assembly.

5. Martin and other Titan III associates are providing the Titan IIIM launch vehicle and booster launch services.

Chart 4

Here are a few of the program milestones prior to flight and the flight schedule. The MOL Program, as presently approved, includes seven launches: two unmanned launches to qualify the Titan IIIM booster, verify spacecraft structural integrity, and qualify the GEMINI B; three 30-day manned-automatic missions in all-up configuration photographic systems; and two 30-day -- or longer -- unmanned-automatic missions with all-up photographic configuration systems.

You will recall that last summer, the first manned launch was projected for December 1969. During the project definition phase, it became obvious that there was insufficient time to accomplish all sequential ground testing prior to that date. Additionally, in view of the small number of flights, and to insure the very best resolution photography at the outset, we decided to fly a production-type optical assembly rather than a development model. This required a nine-month program adjustment into 1970. Then, for higher assurance in meeting critical milestones, and in view of expected funding levels in FY 68 and FY 69, another three months was added. Thus, the first all-up manned flight now is planned for December 1970.

All associate contractors participated in the formulation of the present master schedule; all agree it is technically attainable, realistic, and can be accomplished within the funds estimated; and signed contracts to that effect.

Note the more than two year period required for manufacture, assembly, and test of a complete system.

CHART 5

This is the manpower picture -- present and projected -- for the five major associate contractors.

The level-off this last spring reflects the transition period from the old schedule to the current one.

For comparison purposes, the APOLLO Program had between 65 and 70,000 contractor personnel on board at its peak about the first of this year.

CHART 6

This is the estimated total cost of the MOL Program. The red bars on the chart indicate the amounts included in the current DoD Five Year Defense Plan.

Note the discrepancy in FY 68. The $480 million NOA requirement was the MOL Program Office estimate at the start of the year. The current AF Financial Plan includes $440 million. We are tracking forecast versus actual expenditures and commitments very closely for the first six months of Fy 68 and will have a more precise estimate about the first of the year.

CHART 7

The major extensions of current technology occurs in the Eastman Kodak and General Electric efforts associated with the camera system. Since they will talk about areas such as these listed on this chart, I will not.

I would like to mention, however, that back-up work is underway in several areas, for example:

1. Alternate mirror polishing techniques at two different manufacturers and one university;

2. An alternate mirror material called Cer-Vit which has greatly superior thermal qualities to the present fuzed silica.

Chart 8

Not only must the optical assembly and camera be manufactured with great precision, but several technically-difficult functions must also be precisely accomplished on orbit if [redacted] resolution photography is to be achieved. This is where man becomes an important asset in diagnosing troubles, adding vernier adjustments, or manually operating failed or malfunctioning automatic subsystems. Simulations indicate that man can provide at least as fine a control as the automatic systems for these four functions . . . and you will hear more about these during the course of the evening.

Also, once the automatic devices are working reasonably well and do not require repeated adjustment or extended manual operation, we expect the astronauts to increase both the quantity and quality of photography acquired through weather avoidance techniques and/or the selection of targets having a momentary increased value -- for example, a missile on a pad versus a nearby but empty pad.

CHART 9

Last, a word about Government management. The MOL Program has both an open and covert management channel under SecAF and the DNRO.

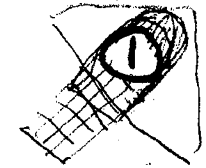
General Ferguson, the MOL Program Director reports directly to Dr. Brown and Dr. Flax and is responsible in the Air Force solely to them for the program. He has a small Program Office in the Pentagon, to assist him in Washington matters, which I head up as a full-time duty.

The Systems Office in Los Angeles, headed up by General Bleymaier, is responsible for overall management of the contractors. The Aerospace Corporation assists him in the general systems engineering and technical direction functions which are Government responsibilities in the MOL Program.

This evening, you will hear from the two major associate contractors concerned with the most critical elements of the MOL system . . . . This is the agenda we propose to follow . . . . Let me note on behalf of GE that they are not on their homegrounds and some improvising has been necessary in terms of items on display.

With that, let me introduce Mr.___________ from the Eastman Kodak Company.

* * *

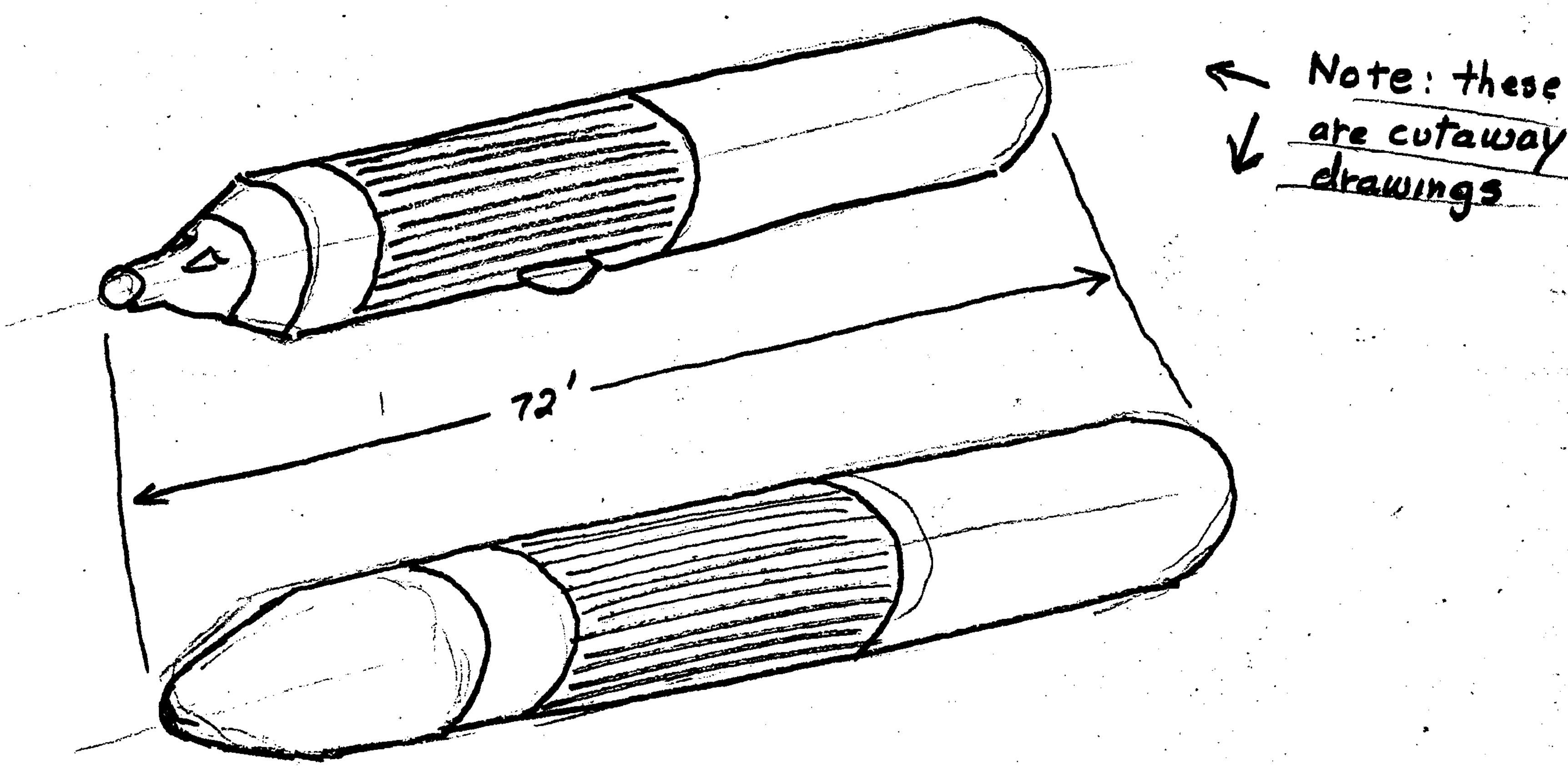


MOL OBJECTIVES:

- ∅ SECURE [redacted] OR BETTER RESOLUTION PHOTOGRAPHY OF SIGNIFICANT TARGETS FOR TECHNICAL & TACTICAL INTELLIGENCE PURPOSES...

- ∅ DEVELOP NECESSARY HIGH RESOLUTION OPTICAL TECHNOLOGY AND SYSTEMS FOR EITHER MANNED OR UNMANNED USE...

~~SECRET-BYE-D~~

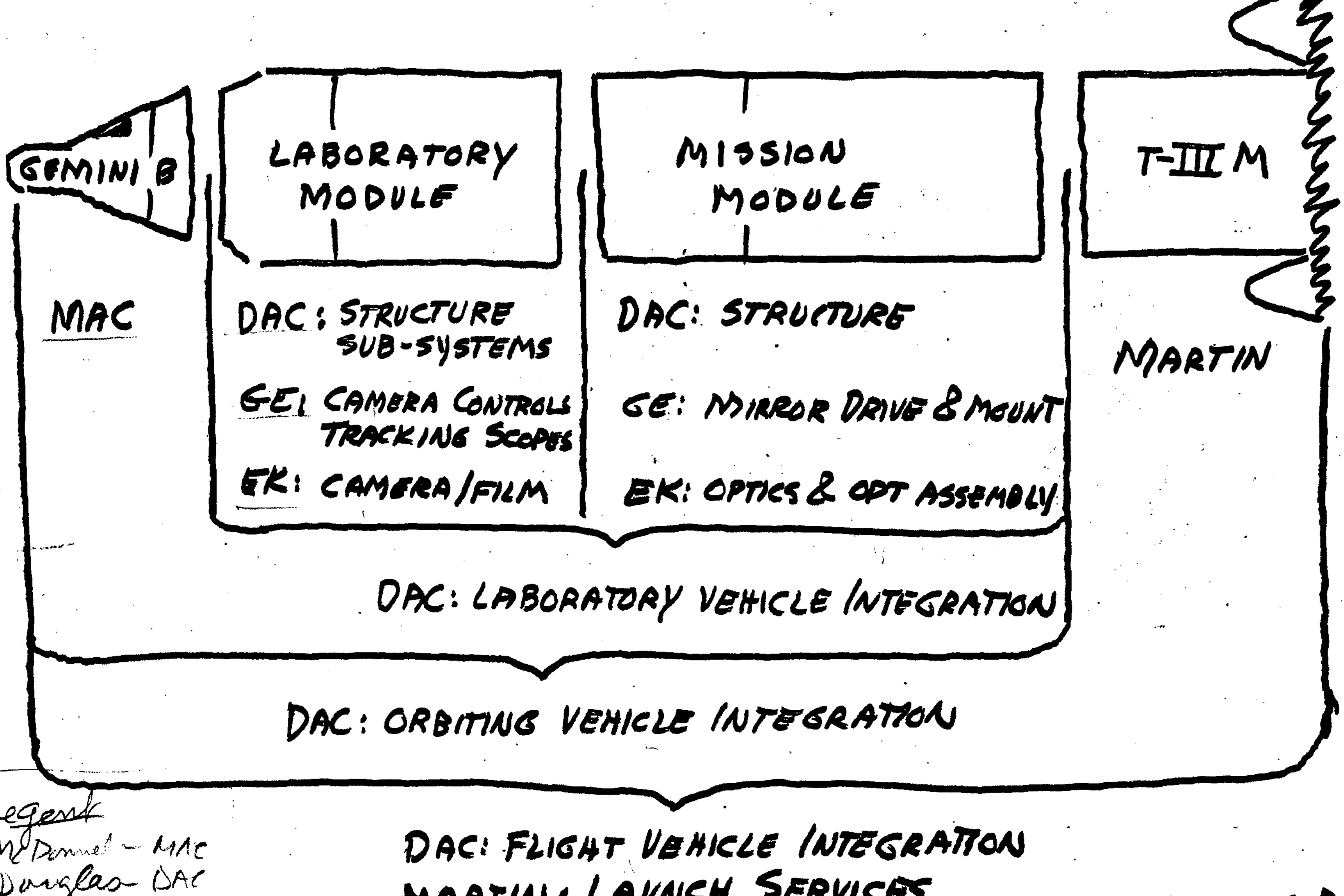


MANNED & UNMANNED MOL

~~SECRET BYE-D~~

acronyms (9)

MOL CONTRACTOR RESPONSIBILITIES:



Legend
McDonnel – MAC
Douglas – DAC

~~SECRET-BYE-D~~

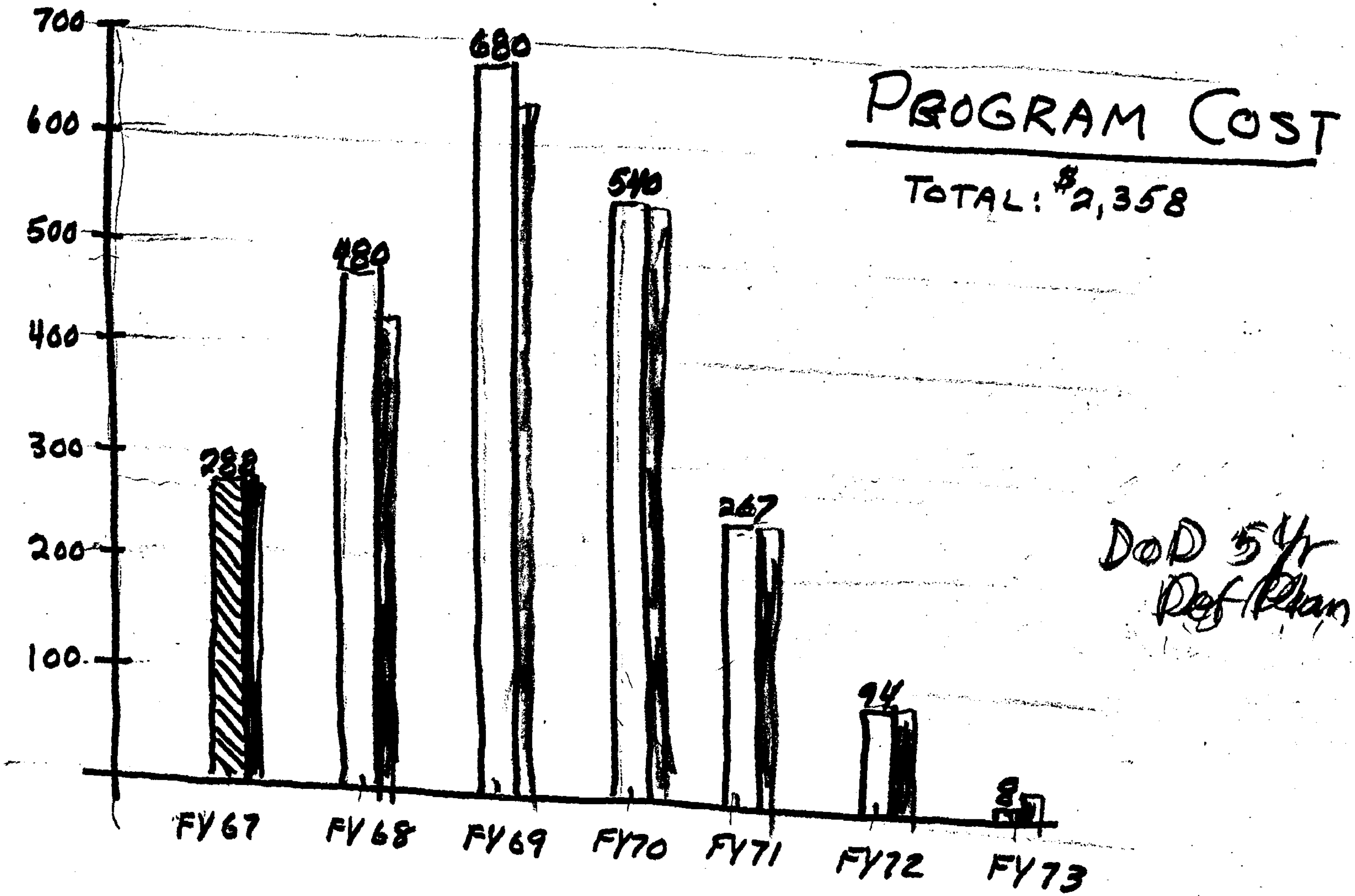
MOL PROGRAM SCHEDULE:

MILESTONES	FY 68	FY 69	FY 70	FY 71	FY 72
PRE-FLIGHT ITEMS					
DYNAMIC TEST OPTICS ASS'Y	▲——	——▲			
STATIC FIRE 7-SEGMENT		▲			
TEST RUN CAM/OPT ASS'Y		▲			
START ACCEPT 1ST PROD CAM			▲		
ASSEMBLE/TEST FV-3		▲——	——	——▲	
FLIGHT SCHEDULE					
T-IIIM/GEM/STRUC QUAL			▲ ▲		
MANNED ALL-UP				▲ ▲	▲
UNMANNED ALL-UP					▲ ▲

~~SECRET BYE D~~

PROGRAM COST

TOTAL: $2,358



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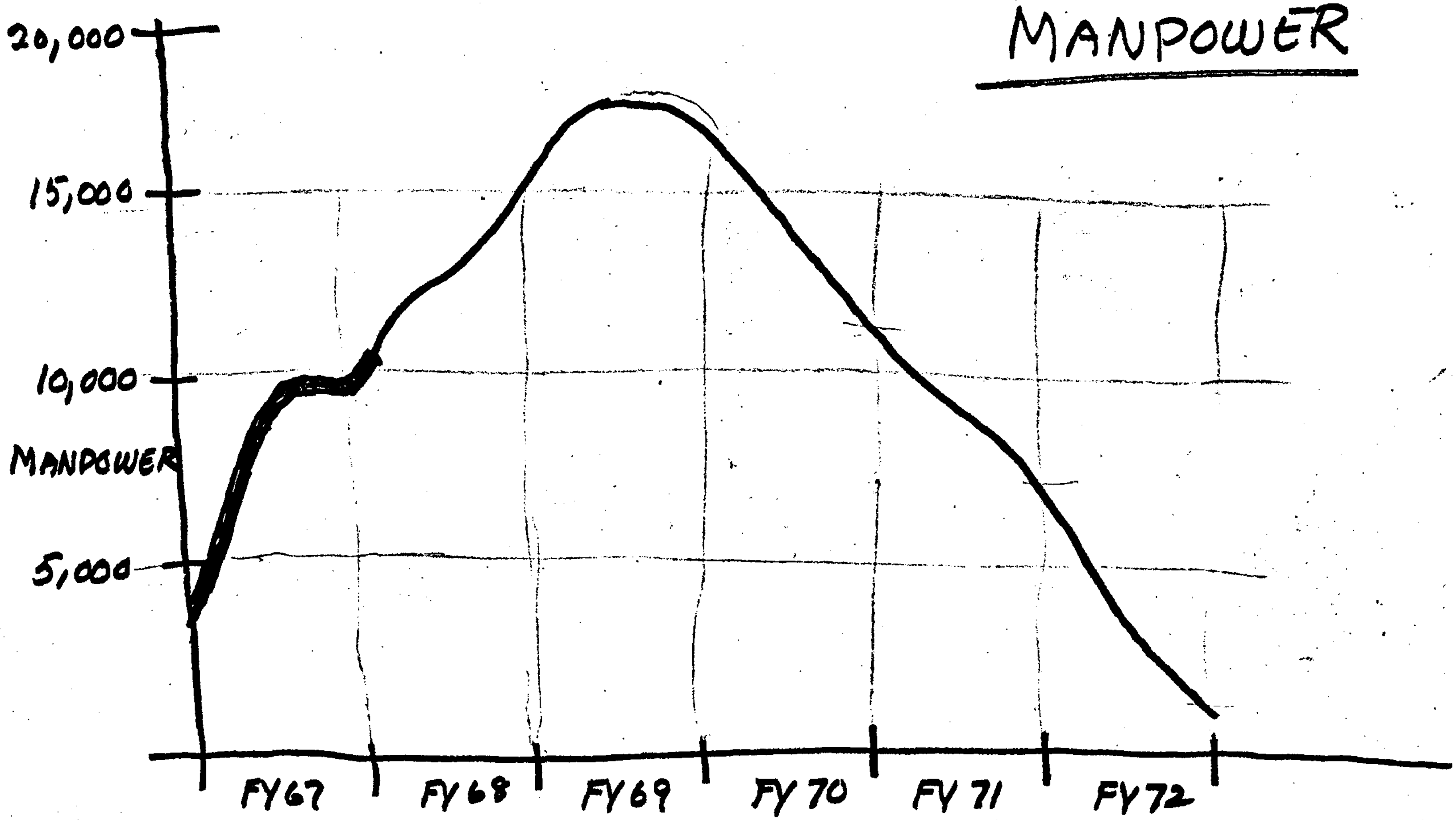
ASSOCIATE CONTRACTOR MANPOWER



~~SECRET BYE-D~~

PRINCIPAL TECHNICAL PROBLEMS:

- ϕ OPTICAL MANUFACTURE & TEST...
- ϕ OPTICAL THERMAL CHARACTERISTICS...
- ϕ TRACKING MIRROR DRIVE & CONTROL...
- ϕ IMAGE VELOCITY SENSING...
- ϕ SPEC PERFORMANCE VARIOUS SUB-SYSTEMS...

MAN IN MOL:

ϕ VERIFY, ADJUST, OR MANUALLY CONTROL:

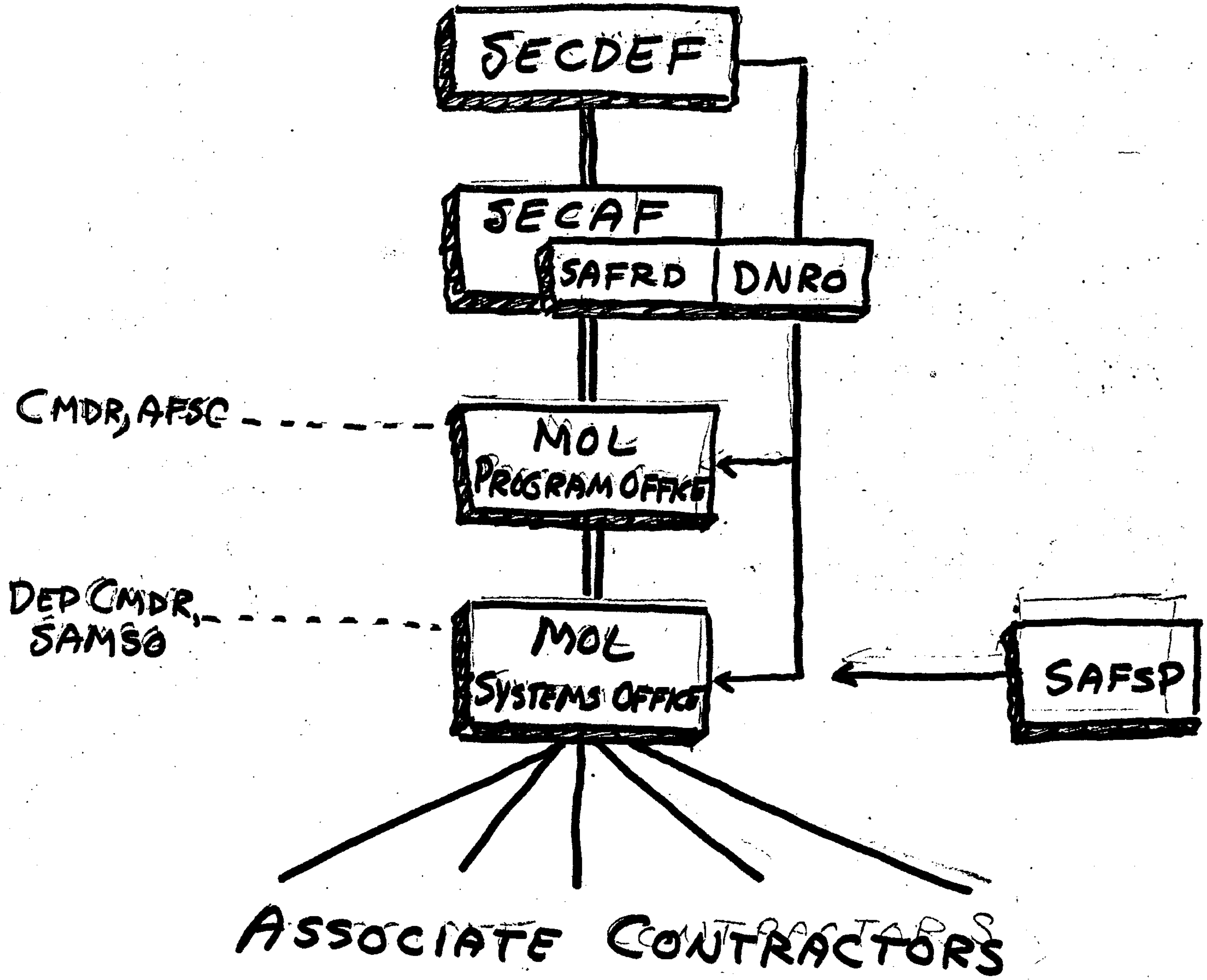
* ALIGNMENT...
* FOCUS...
* POINTING...
* TRACKING...
* EXPOSURE CONTROL...

ϕ BACK-UP FAILED OR MALFUNCTIONING SUB-SYSTEM.

ϕ INCREASE VALUE/QUANTITY OF RECCE PRODUCT.

~~SECRET-BYE-D~~

GOVERNMENT MANAGEMENT:



SECRET BYE D

GAMBIT/DORIAN COMPARATIVE INFORMATION

INDEX

1. Summary Cost Comparison MOL & G-3
2. Costs/Data re G, G-3, C, and Hex
3. MOL Miscl Costs/Data
4. G Flight Performance
5. G-3 Flight Performance

COST COMPARISON TABLE

	MOL		G^3
	Manned	Unmanned	
1965 Program Cost Estimate	$ 1.5 billion	$ 1.2 billion	[redacted]
Current Program Cost Estimate	$ 2.35 billion	$ 1.93 billion	[redacted]
Cost per Launch	$ 85 million	$ 66 million	[redacted]
Cost per day/30 day mission	$ 2.83 million	$ 2.2 million	[redacted]
Cost per day/8-16 day mission	---	---	[redacted] (average)
Cost per Photograph	$5600.-	$3300.-	Strip Camera
Cost per Cloud Free Target	$23,600.-*	$22,000.-*	[redacted]

* The MOL target deck will contain approximately 14000 targets. The target geometry is such that a single aiming point usually covers more than a single target. On a single mission, we estimate photographic coverage of approximately 3000 targets in the unmanned configuration and approximately 3600 in the manned configuration.

** Based on actual take from 6 flights, and an estimate of the 7th flight. For G^3 calculation, any photograph which contains a target which can be positively identified as such, is included in the count, irrespective of its resolution. On this basis, the average is 850 targets per flight.

1/ Includes about [redacted] for increased reliability, double RV's, and other improvements. There are no recurring or production hardware systems (not even first six) included in this total.

2/ Cost of first six = approximately [redacted] each
Cost of double RV (#23 on) = approximately [redacted] each

3/ Cost per day from 8 days to 16 days

System	Launched Cost $(x10^6)$	Weight On Orbit	Days on Orbit	\$/Day on Orbit $(x10^6)$
GAMBIT	[redacted]			[redacted]
G #1 → G #25		4200#	4-5	average
G #26 → G #29		4400#	6	
G #30 →		4500#	8	
GAMBIT-3				
G-3 #1 → G-3 #8		7200#	8+	average
G-3 #8 → G-3 #23 (1 RV)		7200#	8-10	average
G-3 #24 → (2 RV)		8216#	14-16	average
KH-4				[redacted]
C #1 → C #25 (1 RV)		2300#	4-5	
C #26 → C #56 (1 RV)		2800#	5-6	
C #57 → C #91 (2 RV)		3600#	8-11	
*C #92 → C #102 (2 RV)		4000#	13-14	
C #102 → (2 RV)		4000#	13-14	
KH-9				
KH-9 #1		20,200# (T-IIIC)	30	

* First THORAD/14-day AGENA Aug 1966

TAB A

Manned vs Unmanned

Recurring Launch Cost Comparison

	Manned Mode*	Unmanned Mode*
Lab Vehicle	$25.3 million	$22.0 million
Mission Module	24.0	22.1
Gemini B	16.5	--
Support Module	--	4.0
Titan IIIM	17.0	17.0
Crew & Equipment	.5	--
Test Operations	1.0	.5
GSE/TD	.5	.5
TOTAL	$84.8 million	$66.1 million

* On a 4 launch per year basis

TAB B

Manned vs Unmanned MOL

Cost Comparisons

From September 1966
(Million Dollars)

	MOL (7 flights)	Unmanned DORIAN Program (10 flights)	Remarks
Experiments	338	378	Includes 10 payloads at $8M
Mission Module	306	275	
Laboratory Vehicles	836	150	Costs to 1 July plus Termination @$43M
New OCV	---	450	$250M plus 10 Vehicles @ $20M
Gemini B	235	50	Cost to 1 July plus Termination @ $15M
Titan III-M	332	390	Includes 10 Launch Vehicles at $20M
Crew	12	---	
Test Operations	30	25	
Pre-MOL	3	---	
Aerospace	70	60	
Other	42	40	
TOTAL	2204	1818	

o What is the cost per launch for the manned system?

A study completed in May 1967 estimated the cost of 4 launches per year for a 4 year period at $85 million per launch. This estimate included costs of the Gemini B, lab vehicle, mission payload, 7-segment booster and O&M costs (Tab A).

o What is the cost per launch for the unmanned system?

The same study estimated costs of $66 million per launch. The difference is due primarily to substitution of the Support Module for the Gemini B, and changes to the lab vehicle and mission module (Tab A).

o What would be the program cost had we proceeded with an unmanned system program originally?

The program cost, corrected for price escalations, and using the 1965 estimate of $1.2 billion as a base, is estimated at $1.93 billion.

o What would be the program cost if we now proceed with only an unmanned system program?

Approximately $2.05 billion. This cost provides for the development of a new Operational capability Vehicle (OCV).

o What are the costs per day of on-orbit operation?

Based on the launch cost estimates of $85 and $66 million:

Orbital Life	Manned	Unmanned
30 Days	$2.83 million	$2.2 million
42 Days	---	1.57 million*
60 Days	---	1.1 million**

For long duration missions utilizing rendezvous techniques, non-recurring costs are estimated at $300 million; recurring annual costs for the initial vehicle, and 5 resupply missions at 60 day intervals are estimated at $350 million.

At $350 million, 365 days on orbit would cost approximately $950 thousand per day.

* Baseline MOL includes a growth capability to 42 days.
** Provisions in design allow option of increasing operation time to 60 days.

o What is the cost per photograph for the Orbiting Lab as compared to G^3? (1)

	Manned (2)	Unmanned (3)	G^3
10 day mission	---	---	strip camera
30 day mission	$5600.-	$3300.-	---

o What is the comparative cost per cloud free target covered for the Orbiting Laboratory as compared to G^3? (1)

	Manned (4)	Unmanned (5)	G^3 (6)
10 days (5-8 day actual)	---	---	[redacted]
30 days	$23600.-	$22000.-	---

(1) None of the cost estimates consider a value factor for enhancement of the photographic "take" which the manned system permits through selectivity of target choice, and coverage of targets of opportunity, etc.
(2) 30 day mission, 13150' of film, 15000 frames
(3) 30 day mission, 17400' of film, 20000 frames
✓(4) 3600 targets covered (3000 + 20% manned system enhancement)
(5) 3000 targets covered
(6) Based on average launch cost - [redacted]

DORIAN/GAMBIT

6

	4001	4002	4003	4004	4005	4006	4007	4008
Launch Date								
Planned	13Jul63	15Aug63	11Oct63	6Dec63	3Feb64	10Mar64	9Apr64	19May64
Actual	12Jul63	6Sep63	25Oct63	18Dec63	25Feb64	11Mar64	23Apr64	19May64
Incl. Angle								
Planned	94.46	94.2	99.96	97.7	95.8	95.8	103.5	101.0
Actual	95.34	94.36	99.19	97.88	95.6	95.69	103.5	101.1
Apogee								
Planned	115	169.3	184.0	145.0	123.0	123.0	206	210
Actual	115.65	165.75	183.0	155.0	124.4	126.9	210.6	190
Perigee								
Planned	115	101.9	99.0	85.0	94.0	94.0	81.5	92
Actual	108.05	101.5	81.0	77.0	95.3	98.8	83.9	57
Days on Orbit								
Planned	1	3	2	2	2	3	3	4
Actual	1	2	2	1	2	3	4	2
Total COMIREX Targets Reported by NPIC	3	10	4	0	0	143	209	52
Best Resolution/Range Achieved on Msn	10' - 15'	4' - 5'	4' - 5'	--	--	3'	2'6"	2'3" - 2'6"

~~TOP SECRET~~
Handle via BYEMAN
Control System

	4009	4010	4011	4012	4013	4014	4015
Launch Date							
Planned	30Jun64	22Jul64	26Aug64	30Sep64	26Oct64	10Nov64	16Dec64
Actual	6Jul64	14Aug64	23Sep64	8Oct64	23Oct64	4Dec64	23Jan65
Incl Angle							
Planned	93.0	95.5	93.0	96.7	95.5	97.0	102.5
Actual	93.1	95.5	92.9	----	95.52	97.02	102.53
Apogee							
Planned	184.0	200.0	147.0	151.0	169.8	172.5	169.9
Actual	180.6	176.5	157.0	----	175.07	192.57	174.42
Perigee							
Planned	85.0	84.0	85.0	88.0	84.0	85.5	83.2
Actual	83.0	84.45	85.0	----	81.69	85.43	79.9
Days on Orbit							
Planned	4	5	5	5	5	4	4
Actual	2	2	4	-	4	1	4
Total COMIREX Targets Reported By NPIC	0	105	240	0	0	37	688
Best Resolution Achieved on Msn	-	5' - 10'	8'	-	-	2'6"	2'6"

~~TOP SECRET~~
Handle via BYEMAN
Control System

MSN #	*Reasons for Difference Planned vs Actual Launch Date	Mission Anomalies	Remarks
4001	Favorable checkout progress		Hitched-up mode
4002	Exchange second stage		" " "
4003	Tech. Problems during checkout		" " "
4004	Command system anomaly	Control gas depleted rev 5	1st OCV solo msn
4005	Electrical Problems in OCV	Extreme YAW error no usable photography	
4006	Tracking station communication Problem (Thule)		1st successful use of roll capability
4007	Payload power/command decoder		
4008		Vehicle unstable rev 16	
4009	AGENA electronics	Vehicle stabilization & film wrap up difficulties	
4010	OCV replaced	Only 2 days operation due to command malfunction	
4011	ATLAS booster changed command decoder malfunction		
4012	NRO Direction to avoid conflict	AGENA failure/no orbit	
4013			No recovery
4014	Tech. difficulties during checkout of R/V	Early recovery due to stabilization and battery	
4015	Anomalies in OCV checkout		

*Normally epresents operational problems - not contractual delivery

~~TOP SECRET~~
Handle via BYEMAN
Control System

"OCV PERFORMANCE"

G-1 951 "HITCH UP". Heat loss had depleted 4400 lb-sec of the 6300 lb-sec of stabilization thrust available at separation from AGENA on Vehicle 18. All gas lost on Rev 34 when valves went to high thrust mode. Command decoder inadvententy turned off due to noise or "switch bounce."

G-2 952 "HITCH UP." While "hitched up" to AGENA it was noted that OCV control gas temperature was decreasing to point where solo OCV operation would be marginal. Recovery executed on Rev 34 and OCV "solo-ed." At pressurization of the pneumatic system all control gas was expended. Probable cause--cover left off a fuel valve in the OCV pneumatic system. Spurious real time command accepted by vehicle on Rev 14. Attitude control power supply lost on Rev 35.

G-3 953 "HITCH UP." Recovered on Rev 33. Solo after recovery. Some problems in proper roll rates due to switching anomalies "Prohibited modes" resulted in excess gas usage.

G-4 954 Successful recovery Rev 18 on lifeboat. No useful photographs. Vehicle unstable Rev 4 due to gyro heater malfunction over heating rate gyro which exploded. No L.B. telemetry due to problem during countdown.

G-5 955 Successful recovery Rev 34. No pictures. Error in commanding sequence on Rev 2 caused vehicle to drift in yaw. After slewing film forward cause of error found and corrected. Lifeboat failed on post-recovery test. Rev 65--clock recycle and delay time erase (Command System problem).

G-6 956 Successful recovery Rev 51. Roll maneuvers o.k. but impingement of gas on bulkhead gave vehicle thrust effect (high thrust only). Lifeboat failed on post-recovery test. Orbit Adjust engines show erosion effects.

G-7 957 Successful recovery on Rev 64, fourth day.

1. 4°-6° negative pitch error after Rev 41. Attributed by GE to short in the H.S. mixer box.

2. Flew low o.k.

G-8 958 Successful recovery Rev 34, after bad injection from AGENA.

1. Vehicle unstable Rev 15 due to IR Scanners losing horizon reference. Attributed by GE to bad

initial orbital environment.

2. Also thermal blanket tore, bound the TARS platform and perhaps reflected into H.S.

3. No useful photographs after Rev 15.

4. 10pps time signal failed on Rev 16.

5. Command readout failure--certain stored program commands were not executed after Rev 16.

6. On Rev 37 the telemetry did not turn on as programmed. By BUSS command telemetry revealed store program commands were not being executed. Attributed to programmer power supply failure due to high temperature.

G-9 959 OCV.

1. Recovered on Rev 34. No useful photography.

2. Vehicle lost lock from the beginning in the vicinity of the South Pole. Did not re-stabilize away from the pole.

   a. Causes of the instability:

      (1) Horizon Sensor "spooked" by cold environment at S.P.

      (2) Re-located "Roll Nozzles" reflected into H.S.

      (3) Thermal blanket at rear of OCV reflected into H.S. (if it expanded in vacuum due to trapped air).

   b. Fixes:

      (1) Operational procedure--turn off H.S. in vicinity of South Pole.

      (2) Re-locate "Roll Nozzle."

      (3) Restrain thermal blanket and reduce its reflectivity

3. A pressure leak on secondary propulsion system between Rev 32 and 34.

4. Wrench handle left in the R.V.

G-10 960 OCV.

1. Recovered on Lifeboat on Rev 66. (Attempted on 50 but failed due to Kodi problem).

2. No useful photos after Rev 23 due to command problems (started Rev 10).

3. SI--did not work after Rev 2.

4. Command Problem. Could not load stored program commands. Isolated to decoder and associated circuitry. Most probable cause--coaxil cable problems.

G-11
962 Successful recovery on Rev 67. Orbit adjust system malfunction during mission. Only 1 engine apparently burned. Also pressurizing gas leaked. SI worked fine. Soft photos.

G-12
961 No orbit. Agena burned less than one second. Agena engine received a shut down command. No SI on board.

G-13
963 Recovery capsule did not deorbit. Retro rocket did not fire. Destruct system worked.

G-14
964 Lost stability on Rev 9 due to power trouble.

G-15
965 Recovery on Rev 84. Mirror stuck in forward position on Rev 59 attributed to micro switch failure.

G-16
966 Recovery on Rev 81. Mirror stuck in vertical position on Rev 16. TM anomalies on Rev 63 and 64. Transmitter on but no data when first seen. Erroneous readings on secure word counter, environmental power turned off and pneumatic control system was in high thrust. Attributed to EMI from tape recorder.

GAMBIT

G-17 957	Primary door actuator failed Rev 4. One 100 second focus test not executed due to G minute timer. Focus control malfunctioned by rev 31. Excellent photos. Two incidents: (1) mirror servo mechanical interference. (2) Buss test not successful due to ground system problem.
G-18 968	One delay line failed. Slightly reduced programming flexibility.
G-19	Short in 28 volt power system during Agena burn. Unstable. No payload functions

3

	4301	4302	4303	4304	4305	4306	4307
Launch Date							
Planned	28Jul66	27Sep66	14Dec66	22Feb67	25Apr67	6Jun67	8Aug67
Actual	29Jul66	28Sep66	14Dec66	24Feb67	26Apr67	20Jun67	
Incl. Angle							
Planned	94.01	94.00	109.53	107.0	111.5	111.5	111.5
Actual	94.14	93.98	109.57	107.0		111.42	
Apogee							
Planned	159.55	177.77	222.5	231.49	240.48	245.66	249.04
Actual	152.00	177.82	221.97	232.37		198.24	
Perigee							
Planned	84.42	84.50	84.31	77.62	77.75	77.82	74.82
Actual	84.05	81.71	82.44	76.44		75.58	
Days on Orbit							
Planned	5	6	8	8	8	8	10
Actual	5	7	8	8	0	10	
Total COMIREX Targets Reported by NPIC	451	704	828	876	-	2279	-
Best Resolution Range Achieved on Msn	[redacted]	2'6" - 3'	[redacted]	30"	-	[redacted]	-

~~TOP SECRET~~
Handle via [illegible]
Control System

MSN #	Reasons for Difference Planned vs Actual Launch Date	Mission Anomalies	Remarks
4301	Ground guidance equipment malfunction		
4302	Ground guidance station		
4303			
4304	Hardware delivery from contractor		
4305	Delay in delivery of Photo payload section	Failed to orbit TIII B 2nd Stage	
4306	Photo payload relay		1st 10 day msn
4307	Titan 2nd stage skirt (Present planned launch date - 16 Aug 67) ✓ update		

~~TOP SECRET~~
Handle via BYEMAN
Control System

G^3 Anomalies

4301 Slit change mechanism disabled before launch. Time track not recorded due to known small misalignment of film prior to launch.

Much of the stellar camera degraded by flare. Flare from camera looking toward earth great enough to degrade adjacent frame. Minor pressure and static marks.

4302 Variable image quality due to out-of-focus condition and error in IMC. Stellar camera disabled prior to launch.

4303 Memory malfunctions caused loss of 11 pictures. The stereo mirror did not respond to commands to move from the forward to the vertical position - 8 frames were lost. Average film velocity .38% below the commanded velocity. CORN targets read from [redacted] 38".

375 unprogrammed terrain camera exposures were taken due to command malfunctions. Terrain camera time block malfunctioned. Right stellar camera shutter stuck open intermittently.

4304 Focus setting in error by approximately 5 mils. CORN targets varied from 27" to 84"; focus sensor performance erratic.

Right and left stellar camera shutters experienced sticking. Flare degraded stellar photography. Time blocks for terrain and stellar malfunctioned.

4305 Failed to orbit, T III B 2nd stage.

4306 Best CORN targets - 2 feet. Stop film coast distance gradually increased to 6 inches due to failure of the dynamic brake. As a result, 212 more feet of film were used than programmed.

An error in roll joint position began on Rev 65, corrected by softwear compensation on Rev 74.

Terrain camera time word intermittently exposed. 35 programmed terrain camera exposures did not occur.

[redacted]

Mr. Secretary:

During the next ten minutes, let me refresh your memory on the MOL Program so that the Eastman Kodak and General Electric discussions which follow may be considered in their proper context.

CHART 1 These are the objectives of the MOL Program.

We are developing the manned system and plan to fly it first because: 1. This gives much higher assurance of achieving the primary objective; and 2. It is almost essential to its early accomplishment.

The unmanned system is being developed to insure the continued availability of this reconnaissance capability should international objections or a foreign threat preclude manned operations, or should man be unable to function effectively in space for prolonged periods -- although we do not expect difficulties in this latter regard.

WORKING PAPERS