

NRO APPROVED FOR
RELEASE 1 JULY 2015

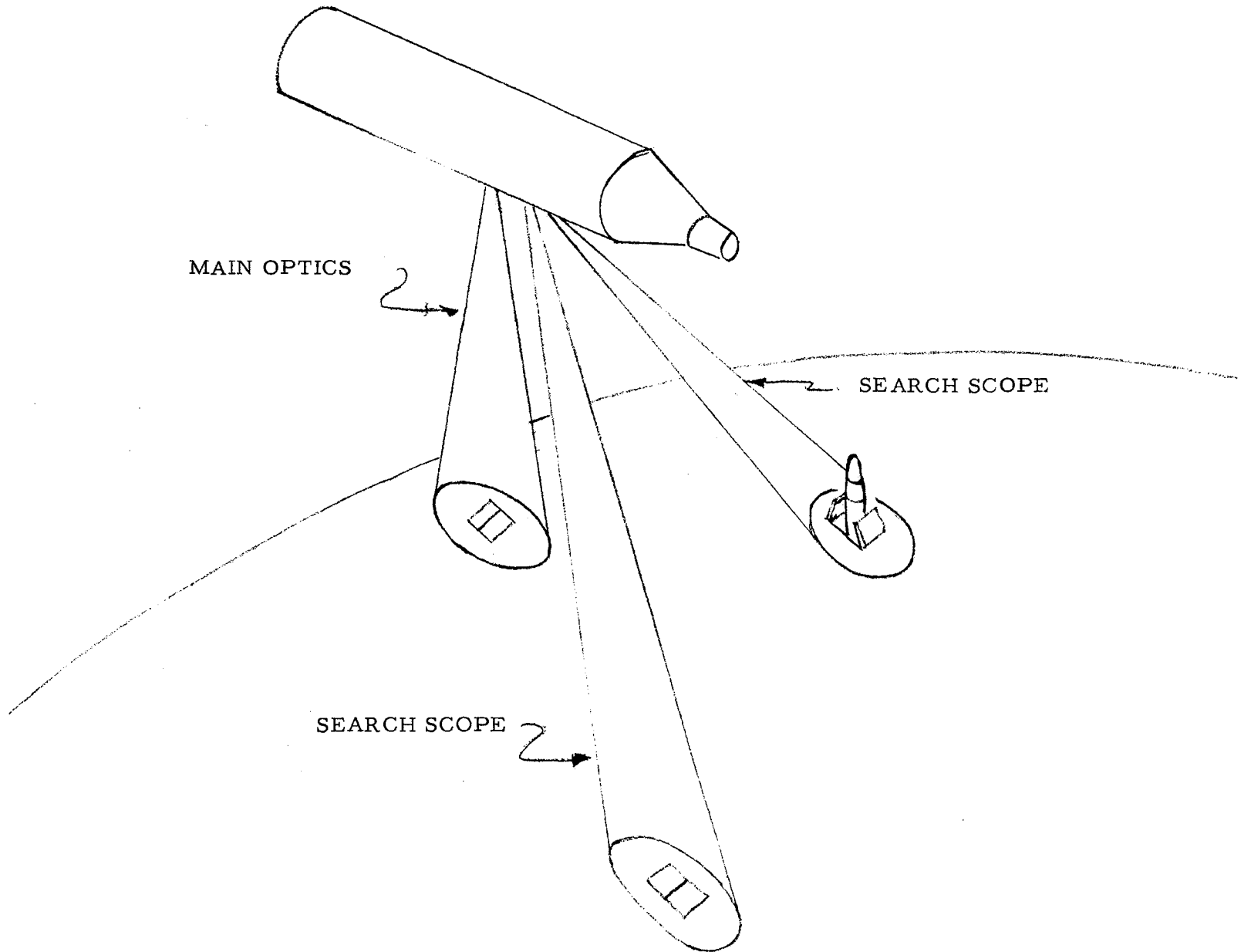
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LEONARD BRIEFING 21 MAY 1966

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MANNED ACQUISITION OF ACTIVE TARGETS

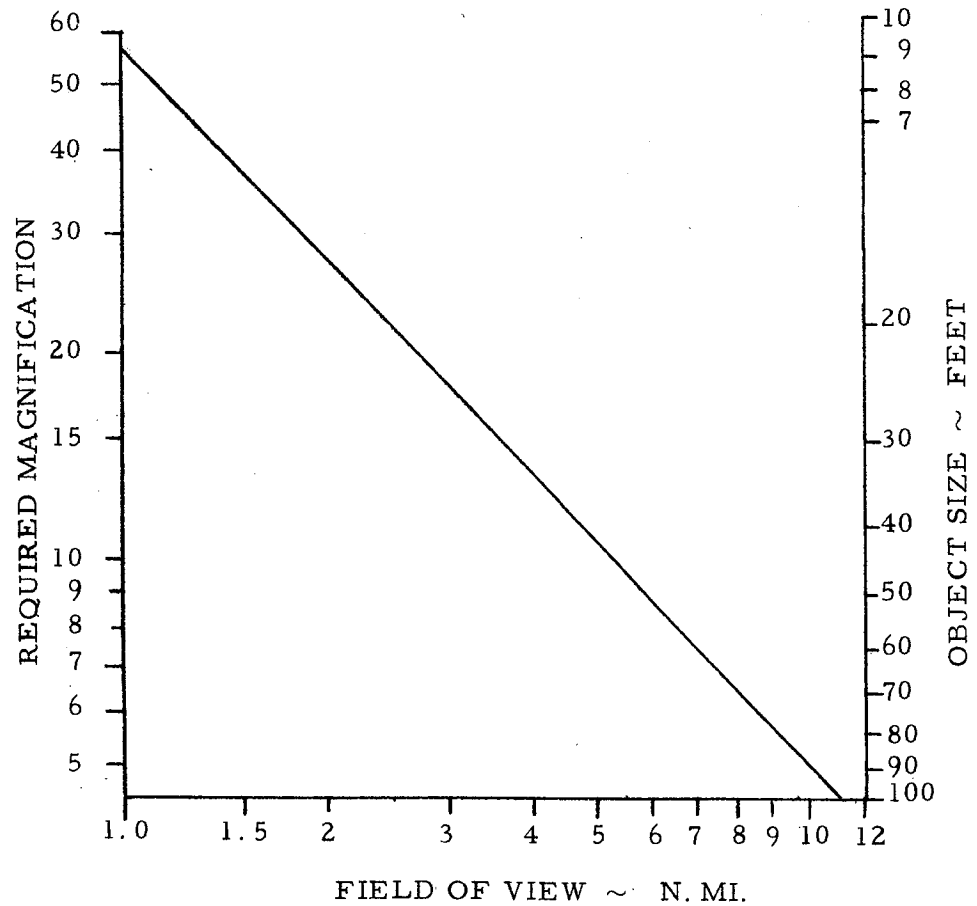


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TARGET EXAMINATION CAPABILITIES

EYE CHARACTERISTICS

- o 2:1 CONTRAST
- o ~ 3 LINE PAIRS PER TARGET
- o 40° EYEPIECE, 5 N. MI. EXIT PUPIL
- o MAX 50 POWER, 10 INCH APERTURE



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FUNDAMENTAL MANNED FUNCTIONS

- o TROUBLE SHOOTING
- o MANUAL OVERRIDE
- o MAINTENANCE
- o BACKUP FAILED SUBSYSTEMS
- o SEARCH FOR ACTIVE TARGETS

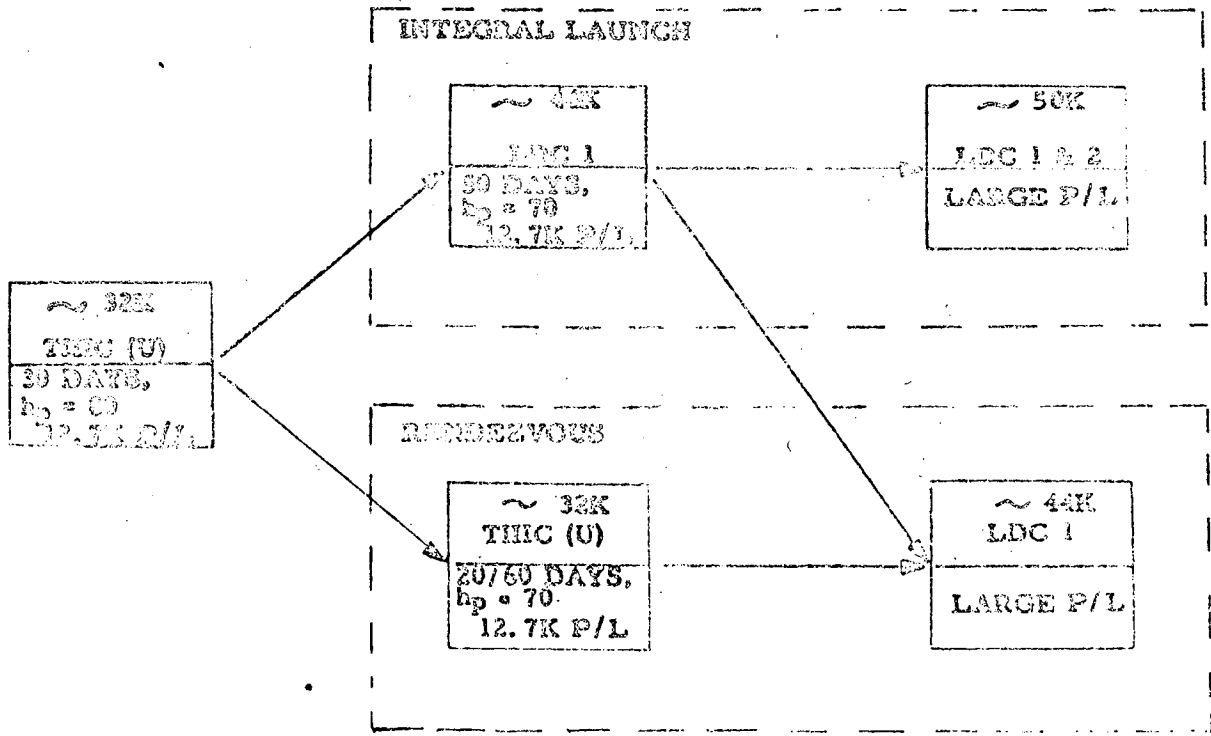
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FOREIGN MOL SYSTEM EVOLUTION



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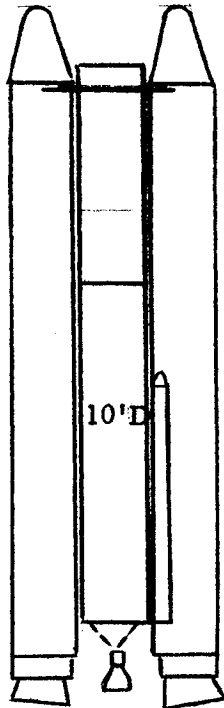
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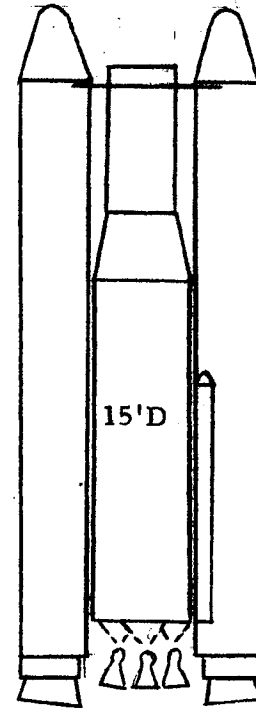


MOL LAUNCH VEHICLES

THH C (U)
32.8K# REF. P/L



THH C - LDC 1
44.0K# REF. P/L



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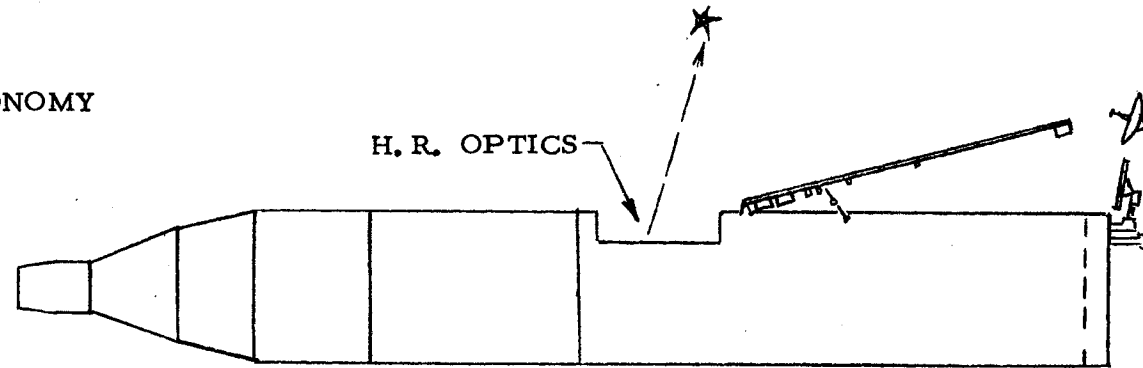
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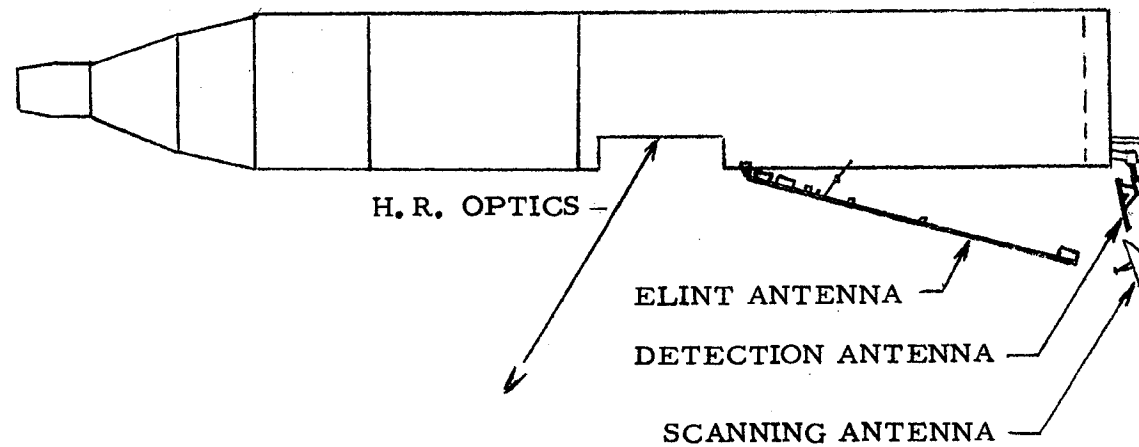


MULTI-MISSION
GROWTH APPROACHES
(APPLICABLE TO INTEGRAL OR RENDEZVOUS)

○ ASTRONOMY



○ ELINT, DETECTION, AND H. R. PHOTOGRAPHY



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SUMMARY

	<u>UNMANNED SYSTEM</u>	<u>MANNED BASED LINE</u>	<u>MANNED GROWTH SYSTEMS</u>
o LAUNCHES/YEAR	7	6	6
o RECYCLE TIME	1 MONTH	1 MONTH	8 DAYS
o NUMBER OF TARGETS PER.YEAR	8,800	10,000	20,000
o RELATIVE NUMBER OF ACTIVE TARGETS	1	~ 3	~ 3

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MOL COST SUMMARY
OPTION 6
MILLIONS OF DOLLARS

LABORATORY VEHICLE & MOL SYSTEM INTEGRATION	720.4
MISSION MODULE	422.5
GEMINI B	216.5
TITAN III M	311.9
FLIGHT CREW EQUIPMENT	7.3
FLIGHT CREW TRAINING	1.8
TEST OPS SUPPORT	2.1
FLT OPS SUPPORT	13.8
RECOVERY	8.9
GSE TD	<u>46.2</u>
TOTAL	1751.4

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COMPUTED CHARACTERISTICS

- o ASSUMED TIME CONSTANTS
 - 6°/SEC ROLL RATE, 12°/SEC PITCH RATE
 - 1 SEC ACCELERATION AND DECELERATION TIME
 - 2 SEC MIRROR SETTling TIME
 - 2 SEC V/H TIME (1 SEC OVERLAP OF SETTling TIME)
- o 80 N. MI. ALTITUDE, 8 DAY REPEATER TYPE ORBITS
(COMPLETE COVERAGE ABOVE 20°N)
- o ASSUMED PICTURE SEQUENCE
 - COMPUTER RUN USED G SOFTWARE
 - TARGET SELECTION ASSUMES BALANCED STEREO OF $\pm 7-1/2^\circ$
AND 1 N. MI. FRAME
 - EQUIVALENT TO TAKING 15° STEREO PAIRS BETWEEN $\pm 20^\circ$
PITCH ANGLES

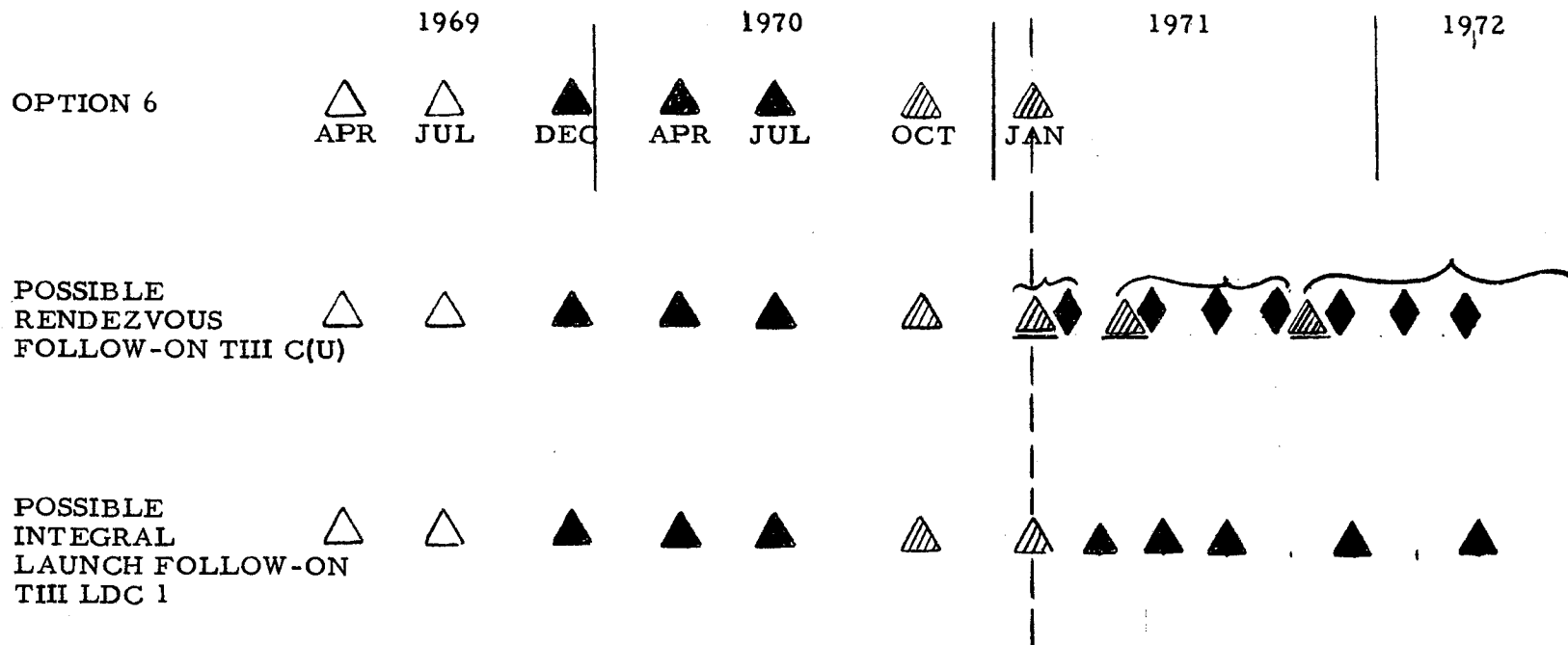
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POSSIBLE GROWTH PROGRAM PHASING



BASELINE PROGRAM IMPACTS:

EITHER FOLLOW-ON

- 60 DAY CRYOGENIC TANKAGE
- "PROVISION FOR" FILM CHUTE

ADDITIONAL FOR RENDEZVOUS

- "PROVISIONS FOR" DOCKING HARDWARE

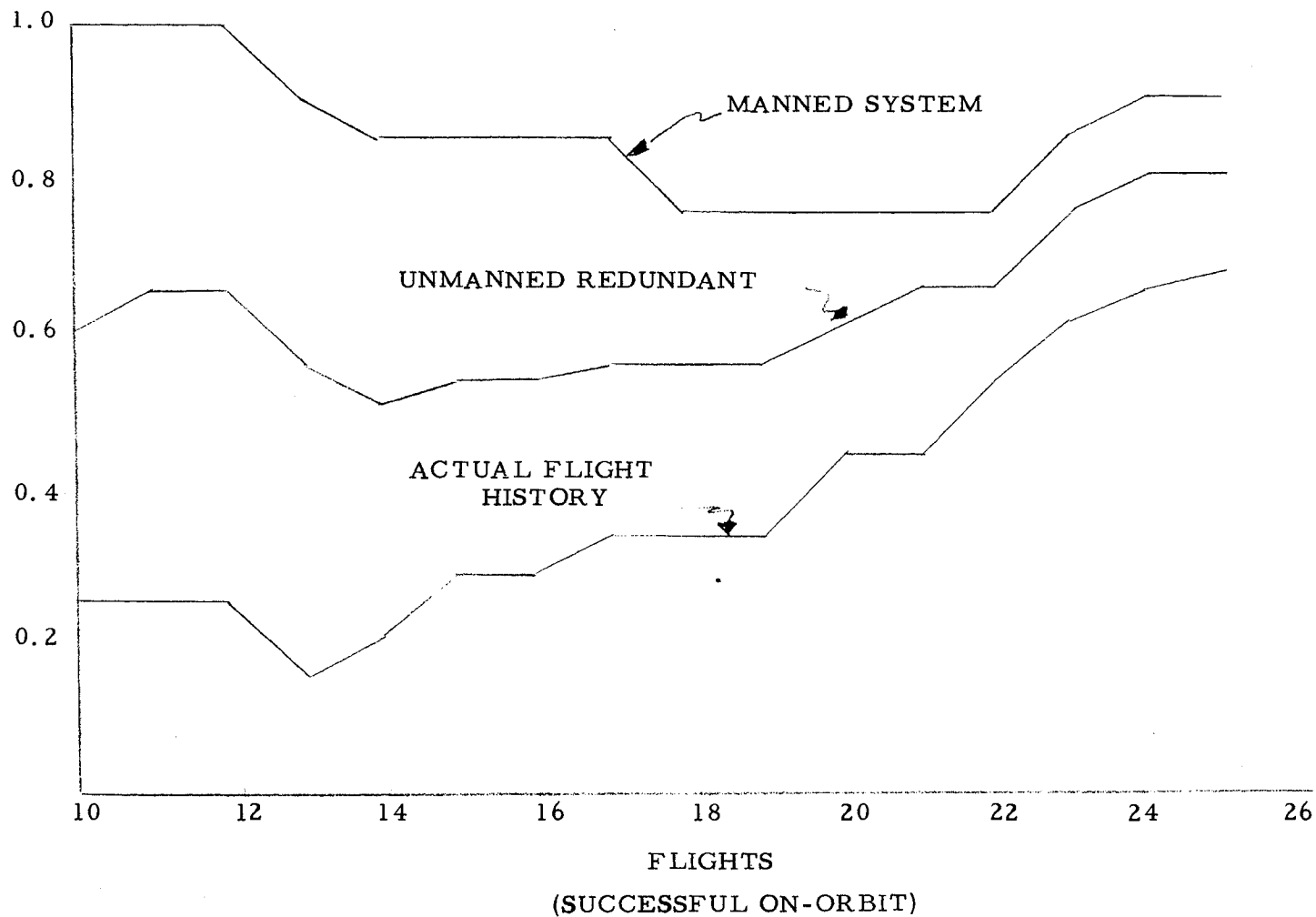
- △ UNMANNED TEST
- ▲ MANNED
- ▨ AUTOMATIC
- ▨ DOCKING PROVISIONS
- ◆ RENDEZVOUS/RESUPPLY

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10 SHOT SLIDING AVERAGE
206-I EXTRAPOLATION



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RESULTS OF TARGET RUNS

- o REQUIREMENT PROJECTIONS INDICATE 330 TARGETS/MONTH
- o 95% OF MONTHLY REQUIREMENT SATISFIED IN ONE CLOSURE
WITHOUT WEATHER
- o WEATHER FACTOR ON AVERAGE IS ABOUT 50%
- o TOTAL OF 836 TARGETS ARE OBTAINED PER CLOSURE (8 DAYS)
WITHOUT WEATHER
- o TAKE DOES VARY WITH CONVERGENCE ANGLE

<u>CONVERGENCE ANGLE</u>	<u>ESTIMATED DIFFERENCE</u>
20	-8 - 15%
15	REFERENCE
10	+20 - 30%

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TARGET RECYCLE ESTIMATE

TYPES OF TARGETS	NUMBER OF TARGETS	RATE % MONTH	INTERVAL (MONTHS)				YEARLY TOTAL
			1	3	6	12	
MISSILE TEST	50	50	25				300
MISSILE FACTORY	278	25	70				840
NUCL. BW/CW, RADAR, MISS.	252	17		50	153		506
A/C, NUCL., NAVAL, RADAR, MISS.	425	8.3		74	60	10	426
A/C, MISS.	2674	4.2			574	188	1336
NUCL., NAVY	2011	2.1				503	503
NUCL., BW/CW, NAVAL ARMY	550	0.8				55	55
							<u>3966</u>

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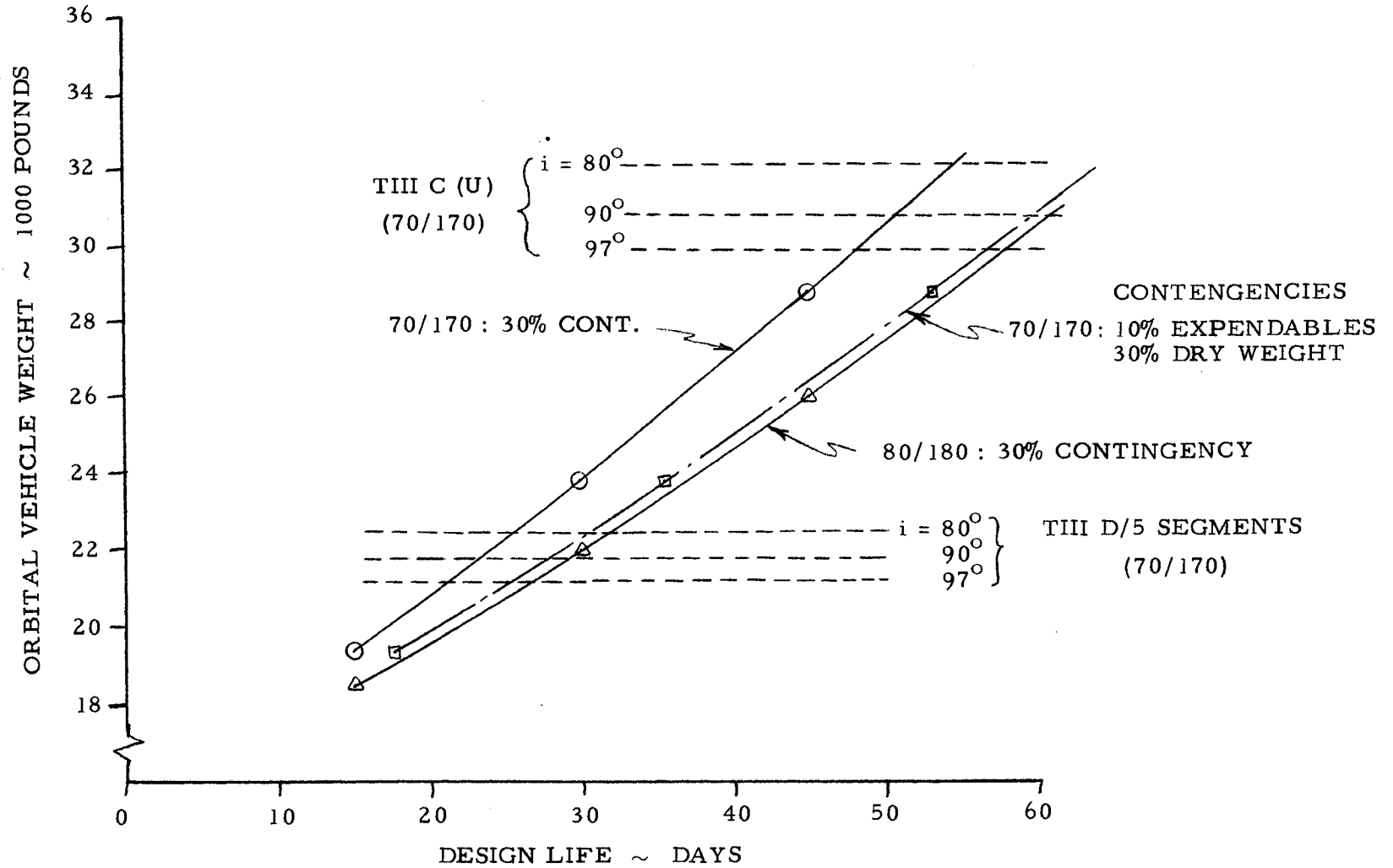
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DORIAN TARGET DECK AND REQUIREMENTS GENESES

- o CURRENT REQUIREMENTS REFLECT PRESENT SYSTEM CAPABILITIES
(MINIMUM INTERVAL 2 MONTHS)
- o SITES UNDER CONSTRUCTION AND MODIFICATIONS WARRANT MONTHLY INTERVALS
- o A CONCURRENT SURVEILLANCE SYSTEM (G³) WAS ASSUMED TO INDICATE
CONSTRUCTION/MODIFICATION ACTIVITY
- o A COMPOSITE DECK WAS CONSTRUCTED OF:
 - o G FLIGHT 977 DECK WITH 4370 TARGETS (SAM'S AND WORLD CITIES
NOT INCLUDED)
 - o DIA DORIAN STUDY DECK WHICH ADDED 1870 TARGETS, 645 OF WHICH
ARE NEW "GROWTH" TARGETS

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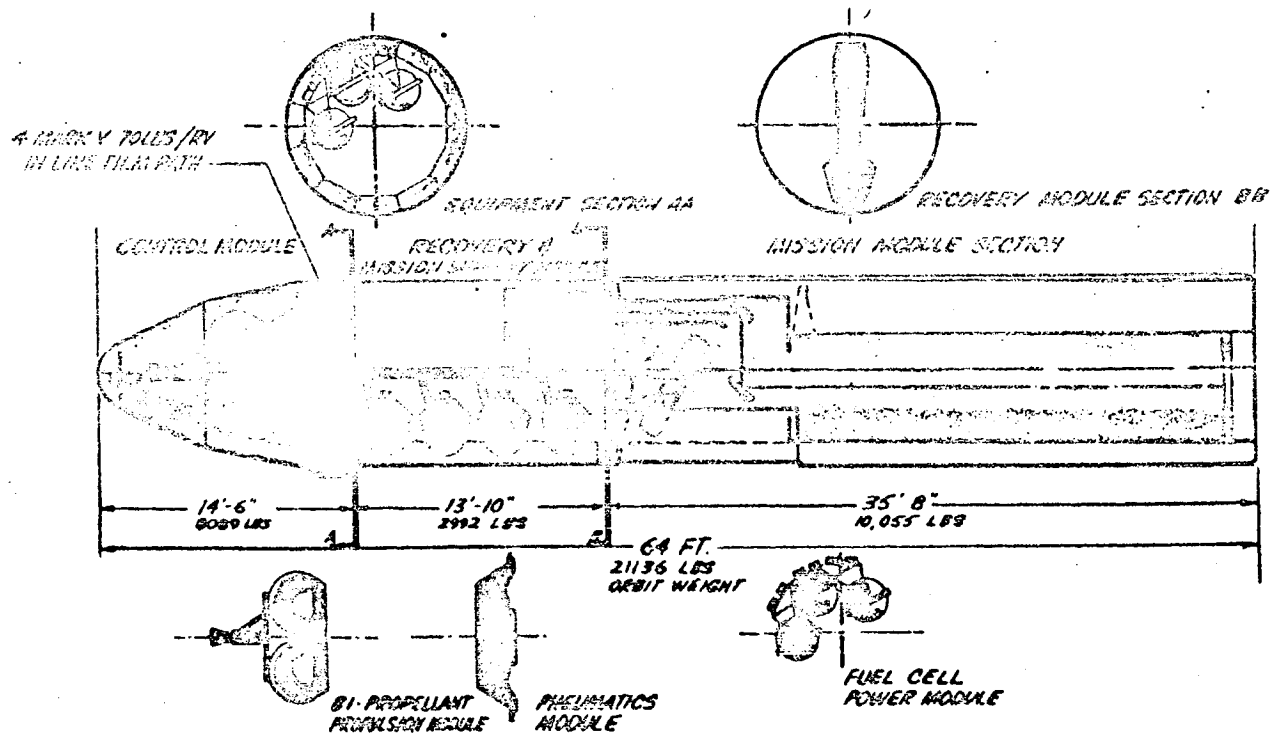
UNMANNED VEHICLE PERFORMANCE TRADEOFFS



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30 DAY DORIAN SYSTEM

TITAN III D-5 SEGMENT BOOSTER - 97° INCLINATION, 70-170 N.M. ORBIT



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ASTRONOMY POTENTIAL

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MARS PHOTOGRAPHY

- o NO MODS
- o PTS FOR INITIAL ACQUISITION - MANNED POINTING THROUGH MAIN OPTICS
- o EXPOSURE TIME - .004 SEC. SO346 (4404 x) -
- o RESOLUTION - MOL 50 N. MI.
 GROUND 300 N. MI.
 PROBE .1 N. MI.

DISTANT STARS

- o MUST HAVE MODIFICATIONS
- o EITHER MOVABLE PLATE HOLDER AND EYEPIECE OR
 LOCKED OPTICS WITH CONTROL MOMENT GYROS
- o POINTING TO .01 SEC. POTENTIAL CONTROL
- o RESOLUTION LIKE .1 SEC. (GROUND LIKE 1 SEC.)
- o 22 MAG WITH SO346-20 MIN. EXPOSURE
- o LIMIT MAG 26 - (20 MIN. EXPOSURE)

ULTRA-VIOLET (FREQUENCIES CUT OUT BY O₃ LAYER)

- o ROSS CORRECTOR INTERCHANGE TO QUARTZ
 (2300-3000A, 1800-2300A)
- o MUST HAVE CONTROL MOMENT GYROS
- o USE SWR FILMS TO PHOTOGRAPH STARS
- o USE IMAGE CONVERTER ON OPTICS FOR MANNED POINTING

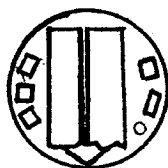
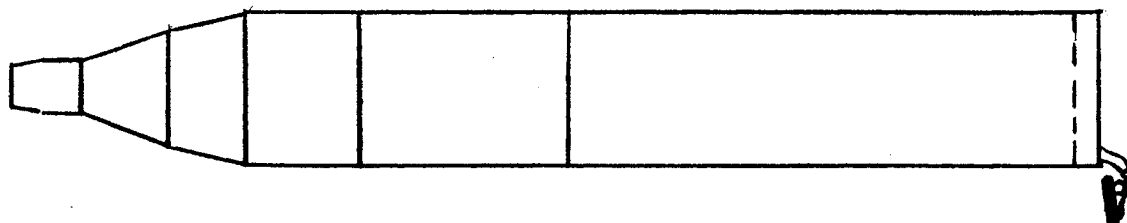
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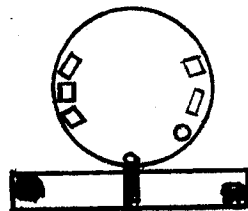
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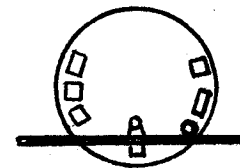
DETECTION RADAR SYSTEM INSTALLATION
BASIC MOL VEHICLE



STOWED



DEPLOYED



FEATHERED

RADAR CAPABILITY

- DUTY CYCLE - 15% ORBITING DURATION
- DEPLOYMENT CYCLE - 30% DEPLOYED
70% FEATHERED
- 100 M² TARGET
- 104 NM SWATH WIDTH
- < 3/4 MILE CROSS TRACK ACCURACY
- < 100 FT RANGE ACCURACY

INSTALLATION CHARACTERISTICS

- TOTAL HARDWARE WEIGHT - 387#
- POWER PENALTY - 800 WATTS OPERATING,
120 WATTS AVERAGE
- PROPULSION PENALTY - < 1 FPS/DAY

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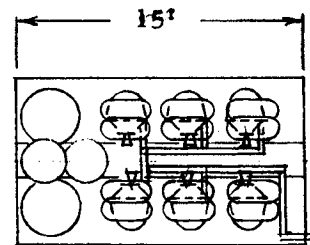
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RENDEZVOUS/RESUPPLY VEHICLE

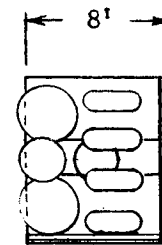
EXTENDED MISSION SERVICE MODULE

- o AUTOMATIC MODE VEHICLE SERVICE MODULE
- o ADD CRYOGENIC TANKS, FUEL CELLS, AND PROPULSION SYSTEM
- o ADD CREW TRANSFER TUNNEL

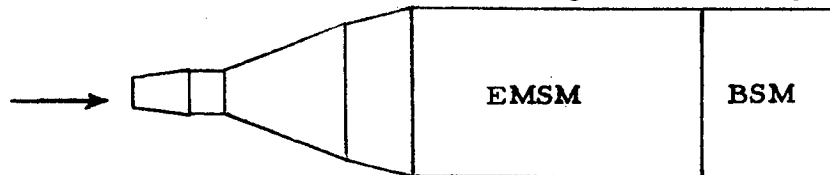


BASELINE SERVICE MODULE

- o BASELINE VEHICLE UNPRESSURIZED SECTION
- o ADD DOCKING HARDWARE



GEMINI-B →



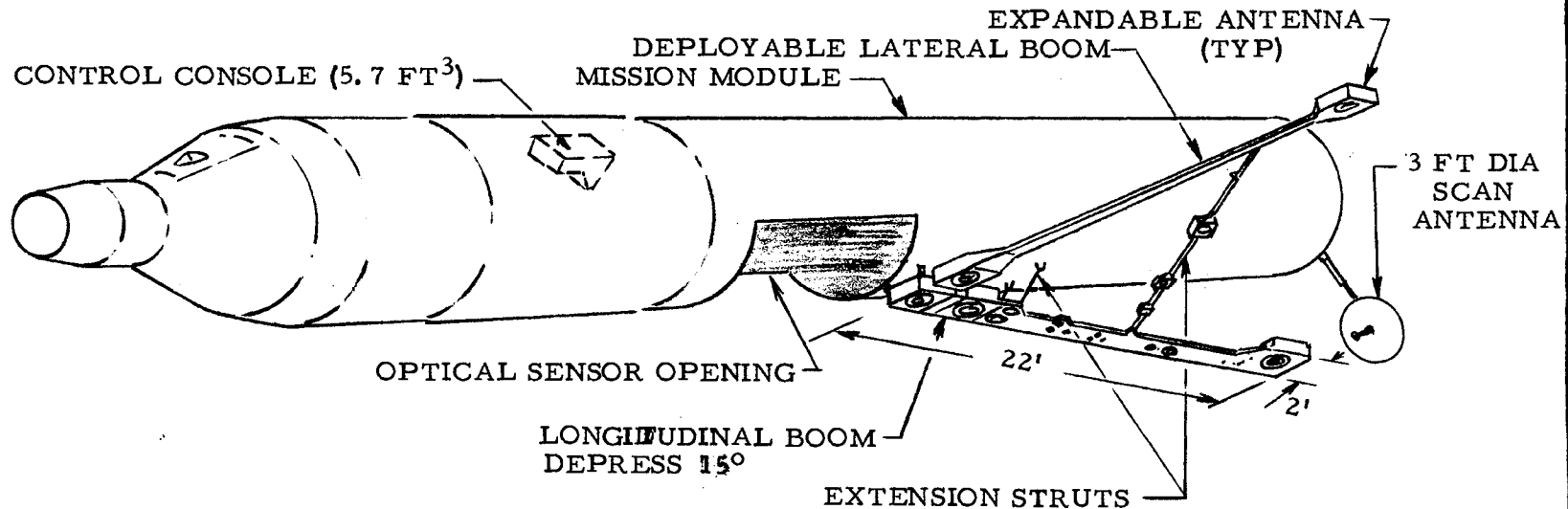
- o LAUNCH WEIGHT 30, 800 LBS

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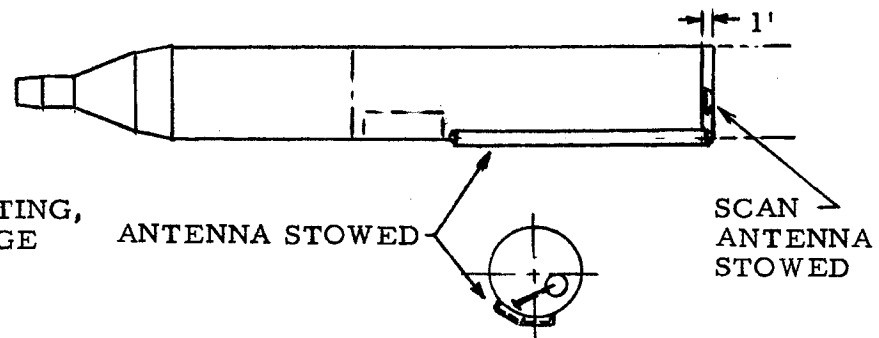
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TYPICAL ELINT INSTALLATION



INSTALLATION CHARACTERISTICS

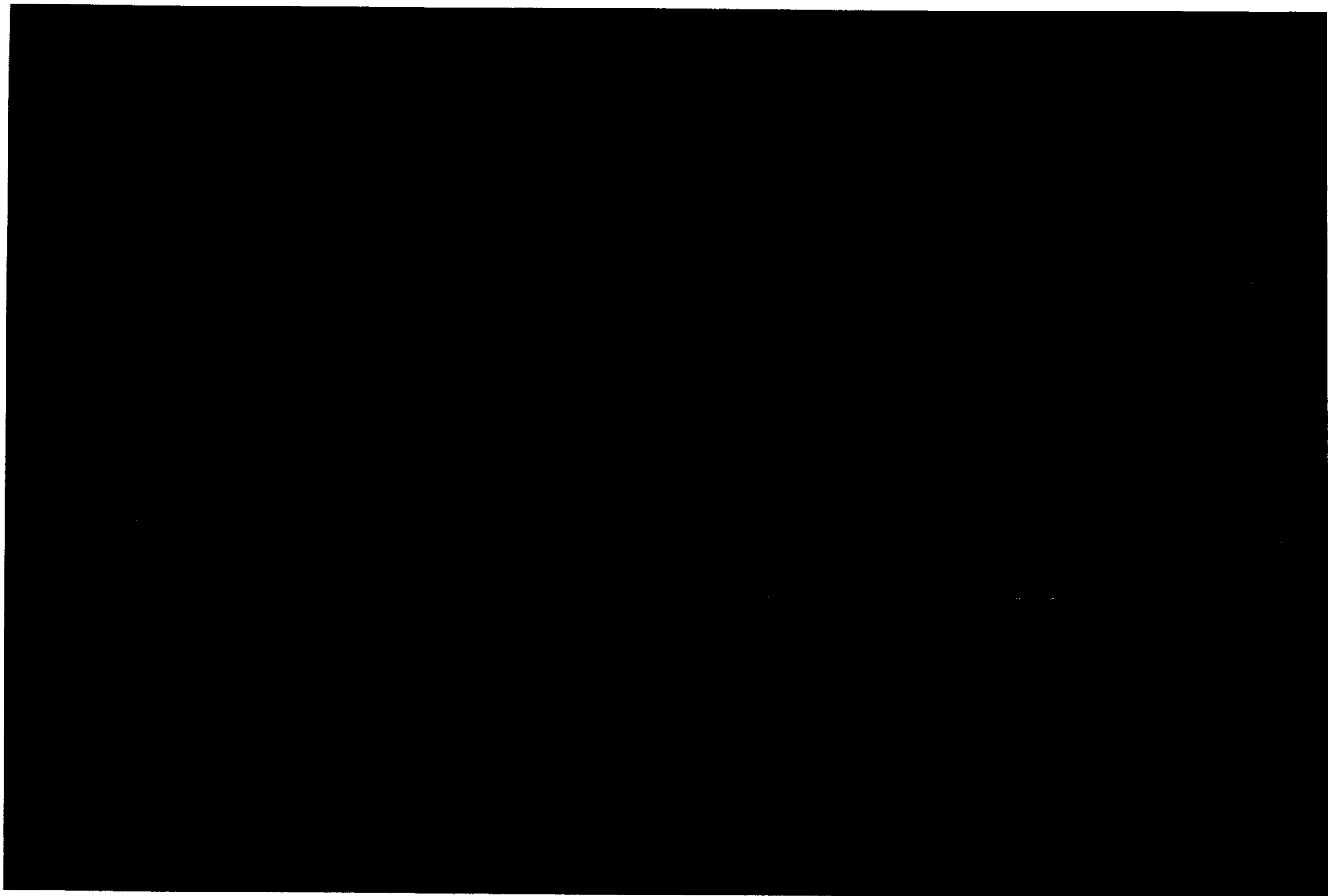
- **HARDWARE WEIGHT INCLUDING STRUCTURE** - 480#
- **POWER PENALTY** - 250 WATTS OPERATING,
25 WATTS AVERAGE
- **DUTY CYCLE** - 10% ORBITAL DURATION
- **DEPLOYMENT CYCLE** - 100%
- **PROPULSION PENALTY** - 1 FPS/DAY



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MOL VEHICLE SPECIFIED WEIGHTS

	<u>TARGET/WGT</u> (LBS)		<u>CONTINGENCY</u> (LBS)
LAB VEH. SEG.	13,555	+	1,940
G/B SEG.	5,660	+	270
MISSION PAYLOAD	8,433	+	1,700
FLGT. CREW SEGMENT	360	+	0
CREW EQUIP. SEG.	553	+	100
	<u>28,561</u>		<u>4,010</u>
TOTAL			

32,571

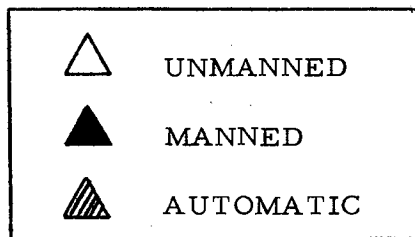
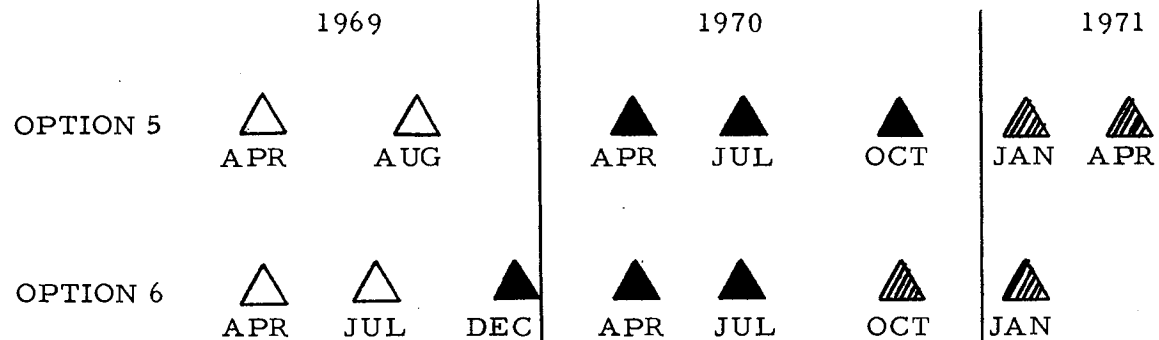
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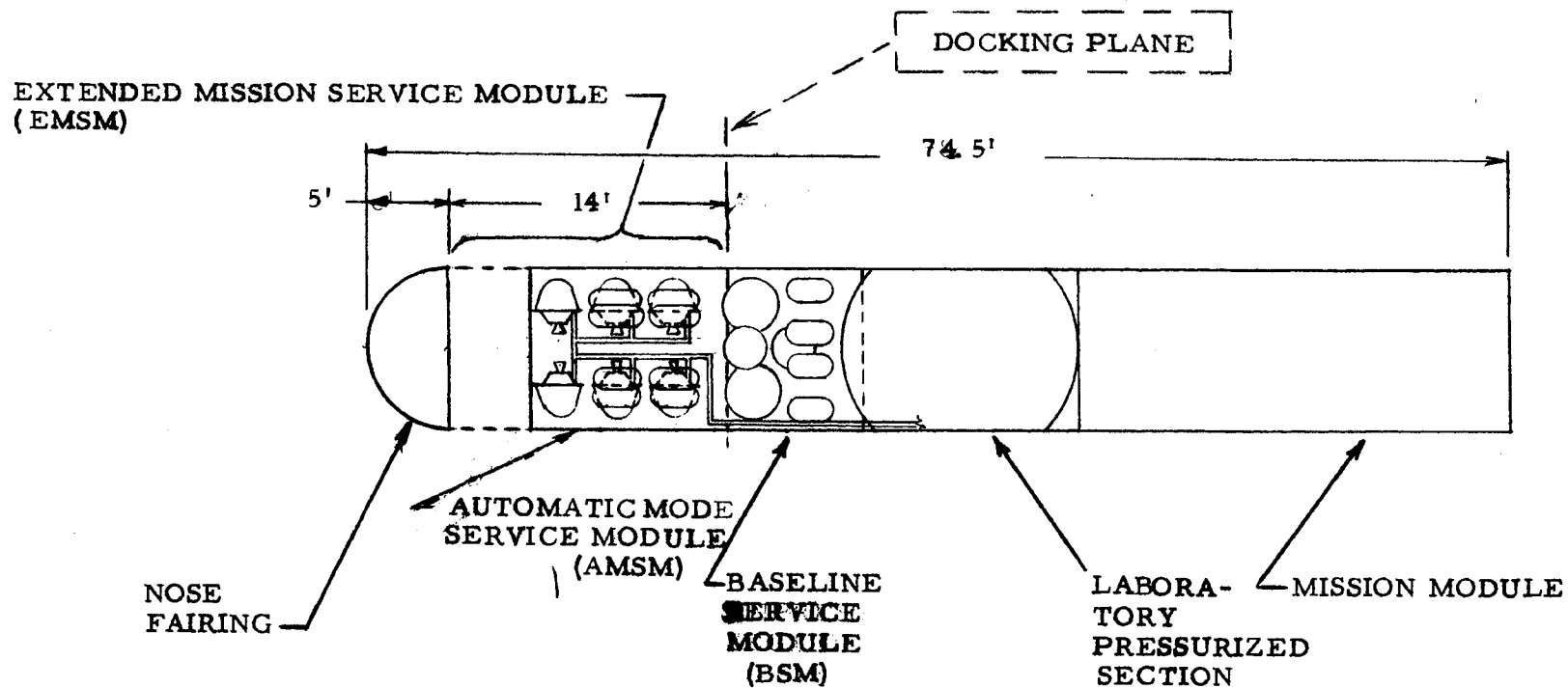
MOL LAUNCH SCHEDULE



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MOL AUTOMATIC MODE/RENDEZVOUS AUTOMATIC MODE VEHICLE



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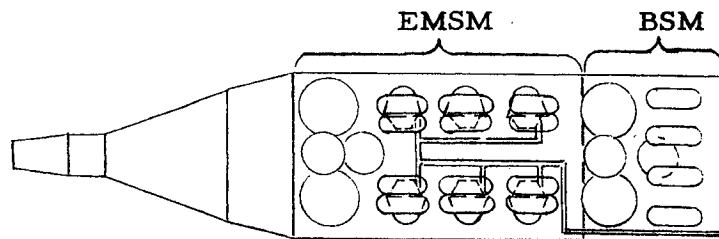


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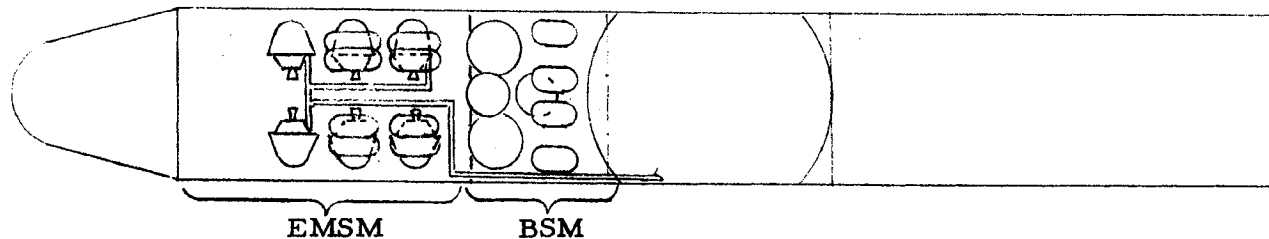
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RENDEZVOUS VEHICLE FAMILY

○ RENDEZVOUS/RESUPPLY VEHICLE (RRV)



○ RENDEZVOUS/AUTOMATIC MODE VEHICLE (RAMV)



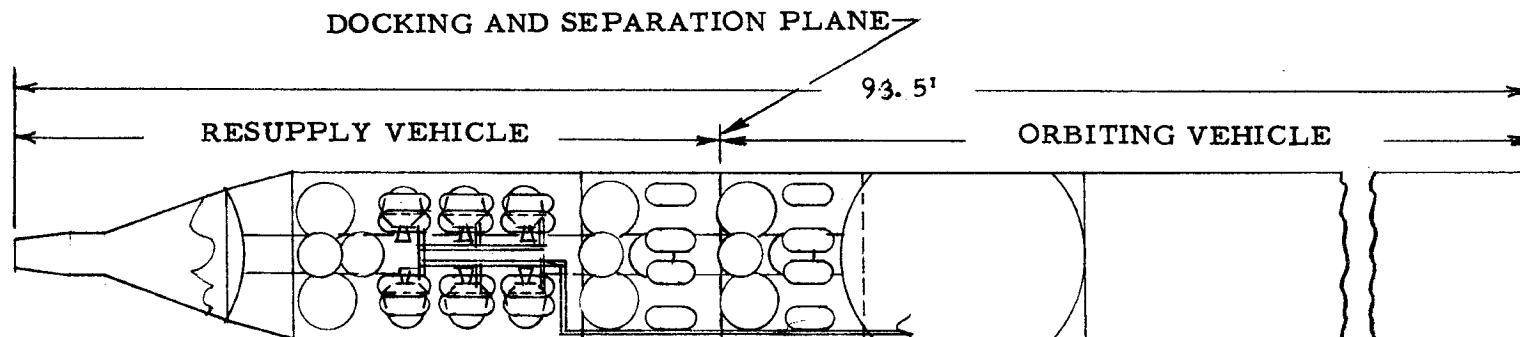
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RENDEZVOUS VEHICLE CONFIGURATION

- o ONE YEAR ORBITING VEHICLE OPERATION
- o 60 DAY RESUPPLY CYCLE



RRV FUNCTIONS

- o ATTITUDE CONTROL (ACTS PROPULSION)
- o PRIME POWER SYSTEM
- o LIFE SUPPORT EXPENDABLES
- o DATA SYSTEM

RAMV FUNCTIONS

- o LIFE SUPPORT SYSTEM
- o ATTITUDE CONTROL ELECTRONICS
- o COMMUNICATIONS AND DATA HANDLING
- o ENVIRONMENTAL CONTROL

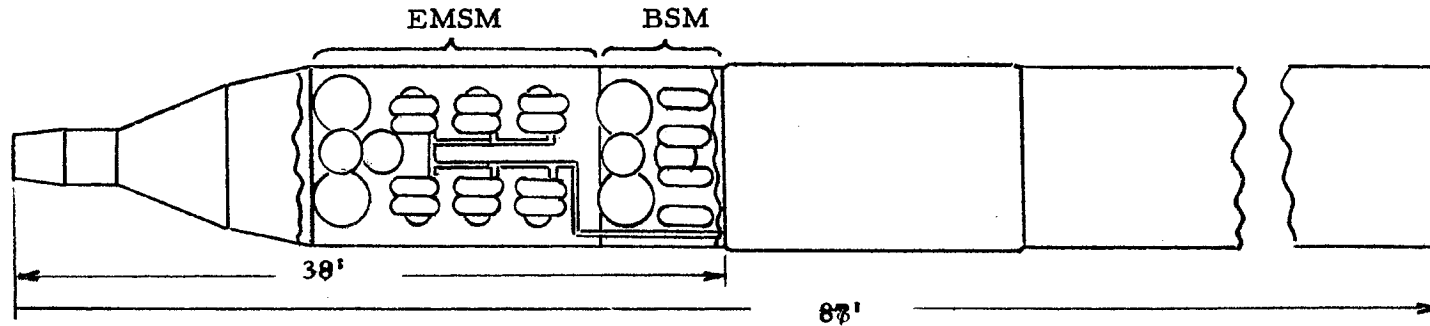
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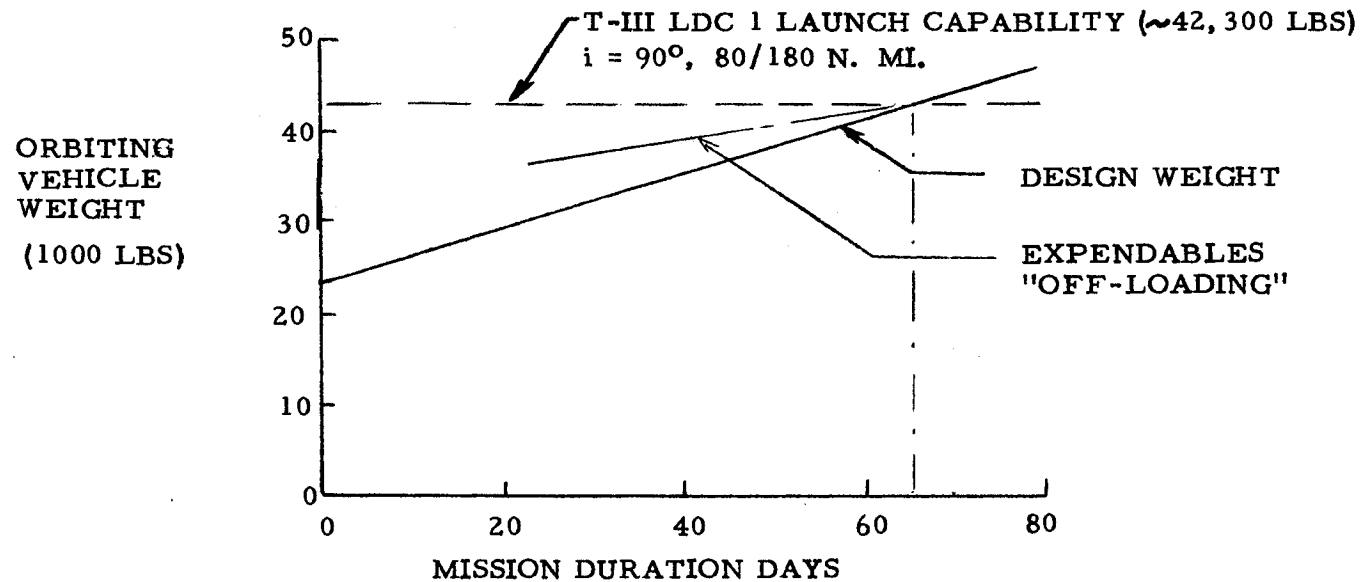
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T-III LDC 1 GROWTH
INTEGRAL LAUNCH



o TYPICAL 60 DAY VEHICLE WGT. = 41,000 LBS

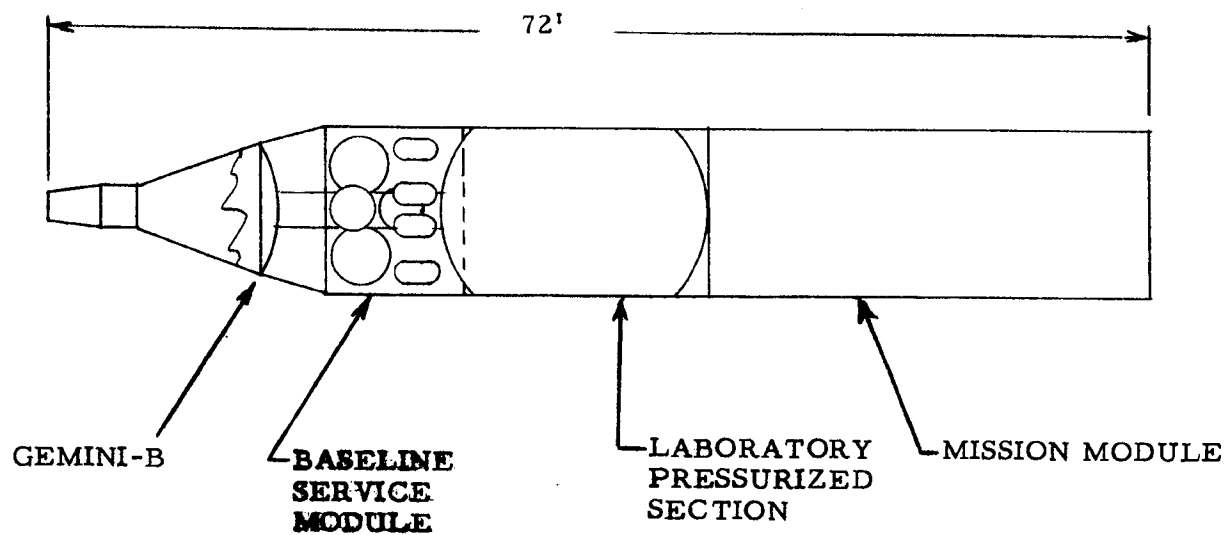


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MOL BASELINE VEHICLE



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