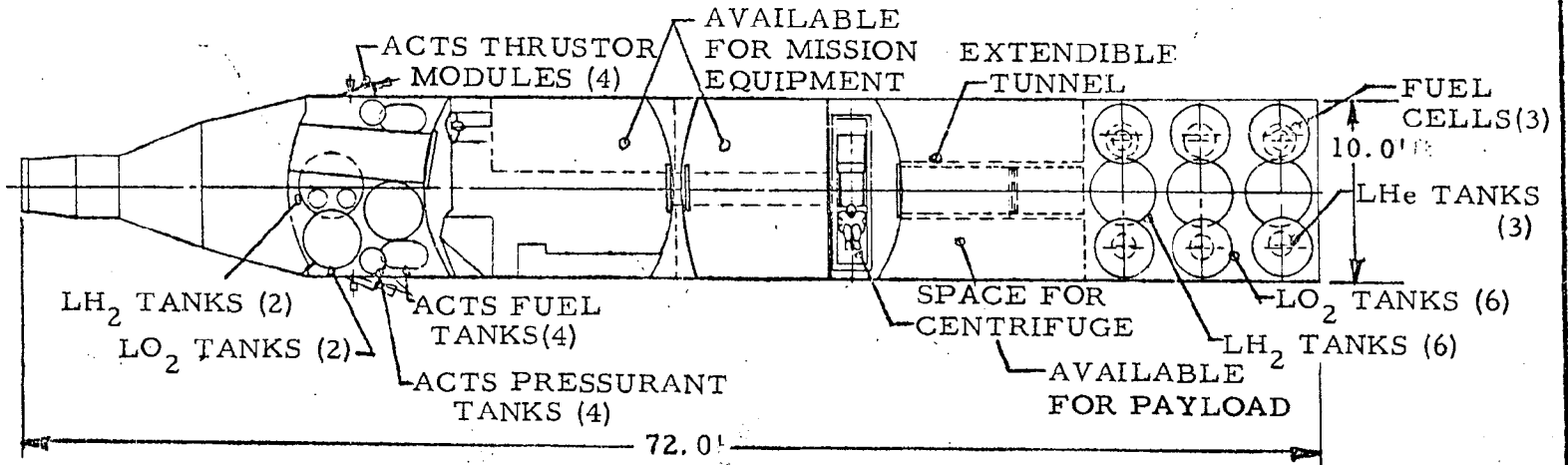


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 ETR

INTEGRAL LAUNCH DUAL COMPARTMENT LABORATORY

(CONFIGURATION AND PERFORMANCE)

o CONFIGURATION



o PERFORMANCE

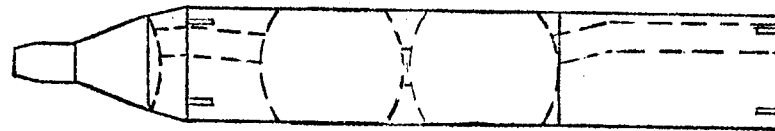
TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,000 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	600 FT <sup>3</sup>
AVAILABLE UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	~ 700 FT <sup>3</sup>
EXPERIMENT PAYLOAD CAPACITY (ETR, i = 28.5°, 180 N M CIR)	~ 5,500 LB
(WTR, i = 80°, 180 N M CIR)	~ 1,000 LB
ELECTRICAL POWER (AVERAGE)	1,650 WATTS*
MISSION DURATION	90 DAYS

\*INCLUDES 200 WATTS FOR EXPERIMENTS

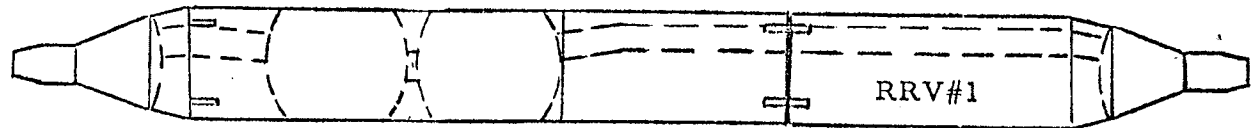
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2 MAN DUAL COMPARTMENT LABORATORY

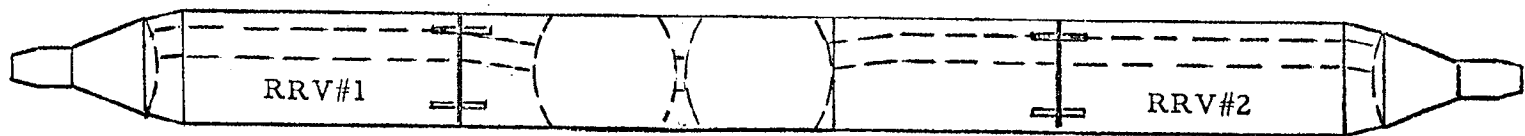
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- INITIAL LAUNCH CONFIGURATION (2 MAN OPS)



- FIRST RENDEZVOUS RESUPPLY (4 MAN OPS)



- ON-ORBIT CONFIGURATION (4 MAN OPS)

RRV FUNCTIONS

- ACTS PROPULSION
- PRIME ELECTRICAL POWER
- LIFE SUPPORT EXPENDABLES
- EXPERIMENTS
- SPARE EQUIPMENT

LABORATORY FUNCTIONS

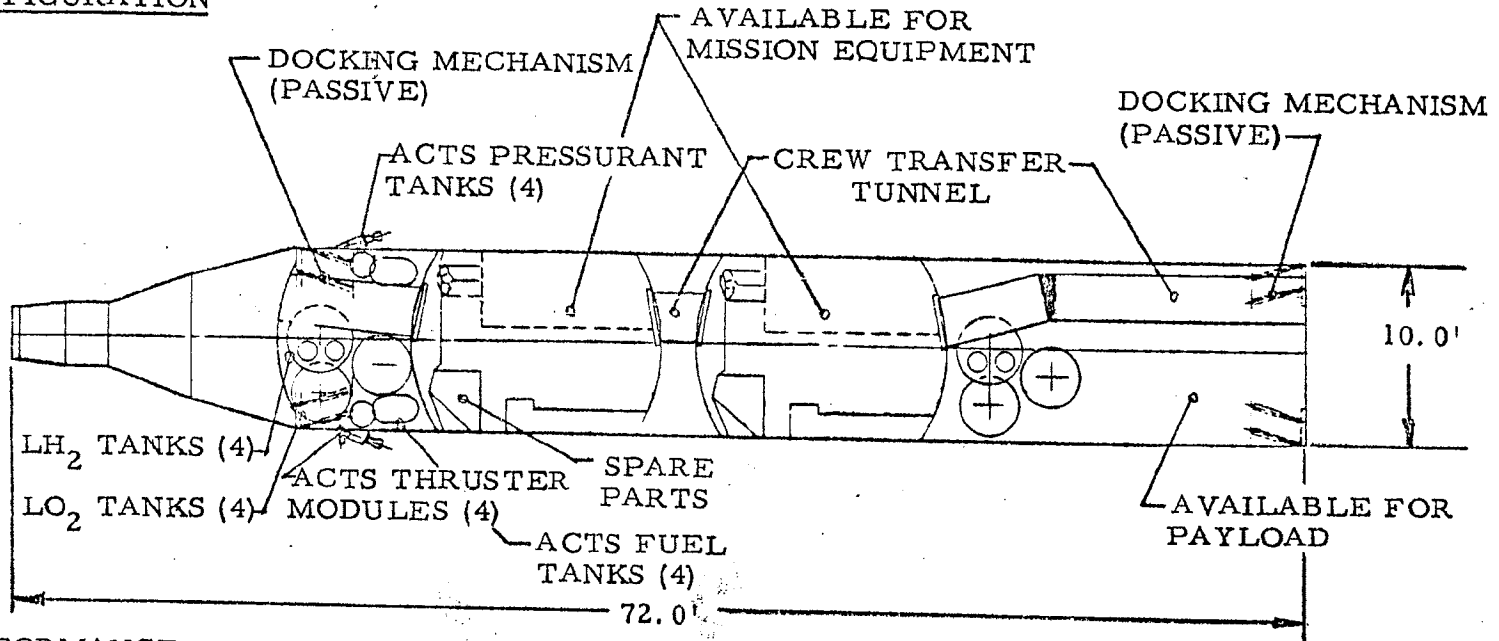
- LIFE SUPPORT/ENVIRONMENTAL CONTROL
- ACTS - REFERENCE
- COMMUNICATIONS/DATA
- BIO-MEDICAL EQUIPMENT
- EXPERIMENTS

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 4 MAN DUAL COMPARTMENT LABORATORY

(CONFIGURATION AND PERFORMANCE)

o CONFIGURATION



o PERFORMANCE

TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,000 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	600 FT <sup>3</sup>
AVAILABLE UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	950 FT <sup>3</sup>
EXPERIMENT PAYLOAD CAPACITY (WTR, i = 80°, 180 N M CIR)	5,700 LBS
ELECTRICAL POWER (AVERAGE)	2,000 WATTS*
RESUPPLY CYCLE	60 DAYS

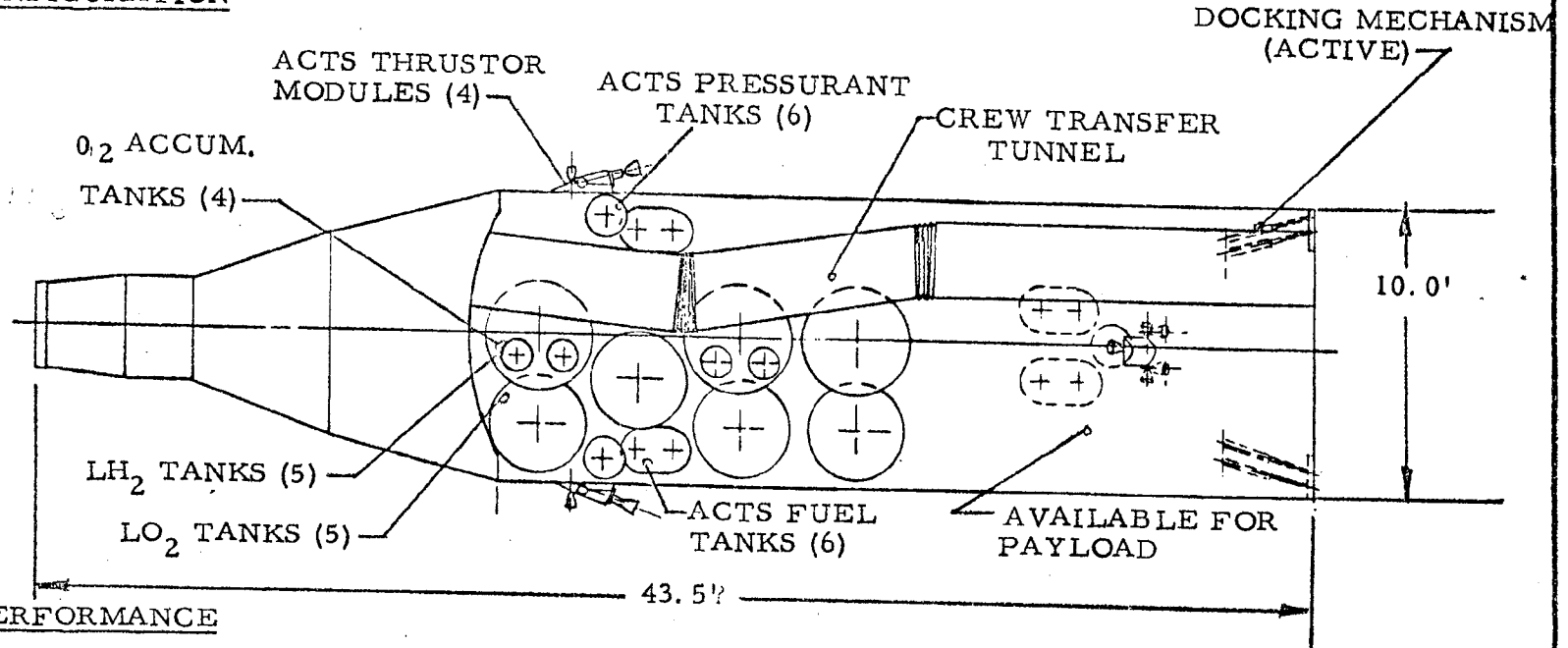
\* 200 WATTS AVAILABLE FOR EXPERIMENTS

~~D SECRET~~ SPECIAL HANDLING  
RENDEZVOUS RESUPPLY VEHICLE

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(CONFIGURATION AND PERFORMANCE)

o CONFIGURATION



o PERFORMANCE

UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	2,000 FT <sup>3</sup>
EXPERIMENT PAYLOAD CAPACITY (WTR, i = 80°, 180 N M CIR)	10,000 LBS
ELECTRICAL POWER (AVERAGE)	2,000 WATTS*
RESUPPLY CYCLE (TO SUPPLY 4 MAN CREW)	60 DAYS

\*200 WATTS AVAILABLE FOR EXPERIMENTS

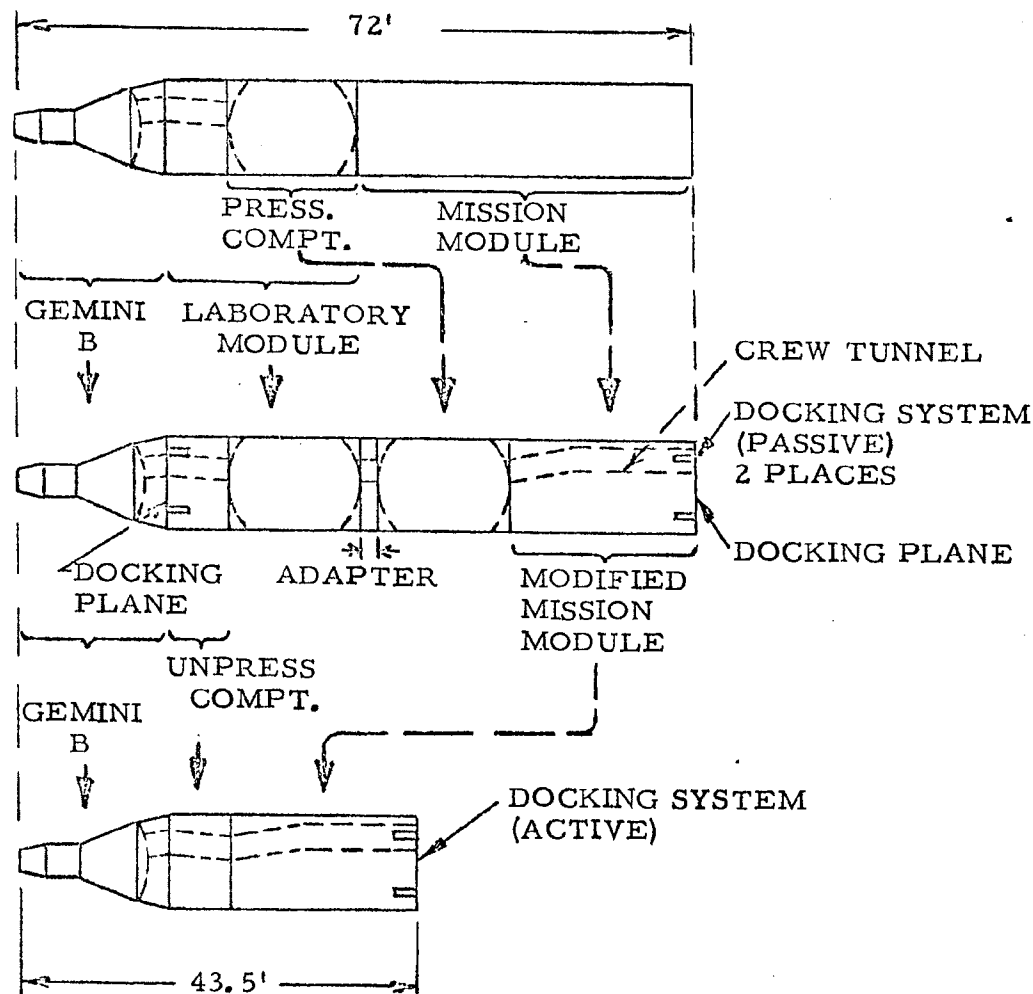
~~D SECRET~~ SPECIAL HANDLING

UTILIZATION OF MOL HARDWARE FOR  
4 MAN DUAL COMPARTMENT LABORATORY CONFIGURATION

○ MOL BASELINE VEHICLE

○ RENDEZVOUS INITIAL VEHICLE (RDV)

○ RENDEZVOUS RESUPPLY VEHICLE (RRV)

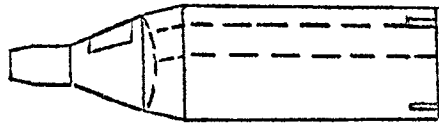


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2 MAN DUAL COMPARTMENT LABORATORY CONFIGURATION

(COMBINED MISSION)

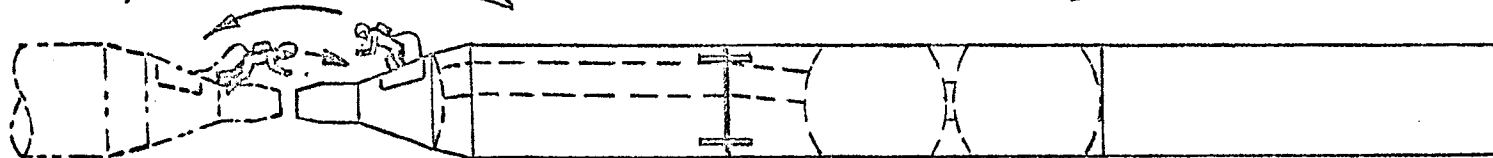


RENDEZVOUS  
RESUPPLY VEHICLE  
(RRV)



INITIAL LAUNCH RENDEZVOUS  
LABORATORY VEHICLE (RIV)

POSSIBLE CREW  
TRANSFER FROM  
SUBSEQUENT RRV'S



RENDEZVOUS ORBITING VEHICLE  
(ROV)

RRV FUNCTIONS

- CREW TRANSPORT VEHICLE
- ACTS PROPULSION
- PRIME POWER
- LIFE SUPPORT EXPENDABLES
- DATA RETURN SYSTEM
- SUBSYSTEM SPARES/REPLACEMENTS

RIV FUNCTIONS

- LIFE SUPPORT SYSTEM
- ATTITUDE CONTROL REF. ELECTRONICS
- COMMUNICATIONS AND DATA HANDLING
- ENVIRONMENTAL CONTROL
- PERFORMANCE DATA

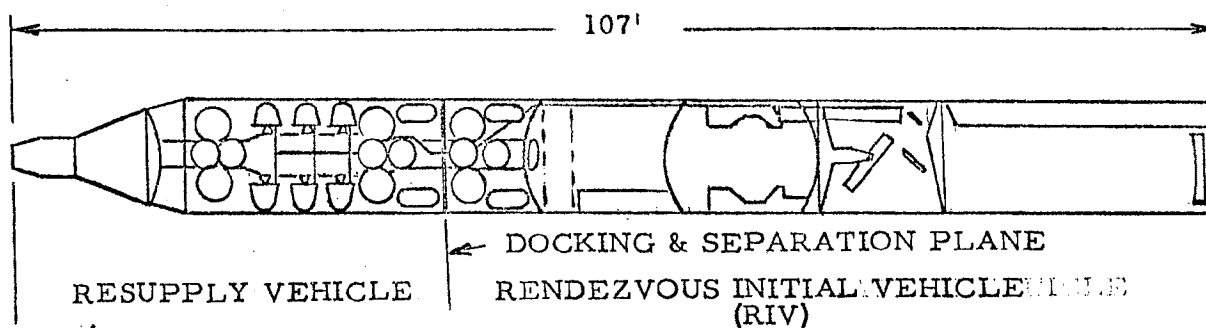
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2 MAN DUAL COMPARTMENT LABORATORY  
CONFIGURATION AND PERFORMANCE SUMMARY  
(COMBINED MISSION)

● CONFIGURATION



● PERFORMANCE DATA

TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,060 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT <sup>3</sup>
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	210 FT <sup>3</sup>
R.I.V. EXP. PAYLOAD CAPACITY ( $i = 96.4^\circ$ , 80/180 NM)	3,000 LBS
ELECTRICAL POWER (AVERAGE)	1,950 WATTS
RESUPPLY CYCLE	60 DAYS

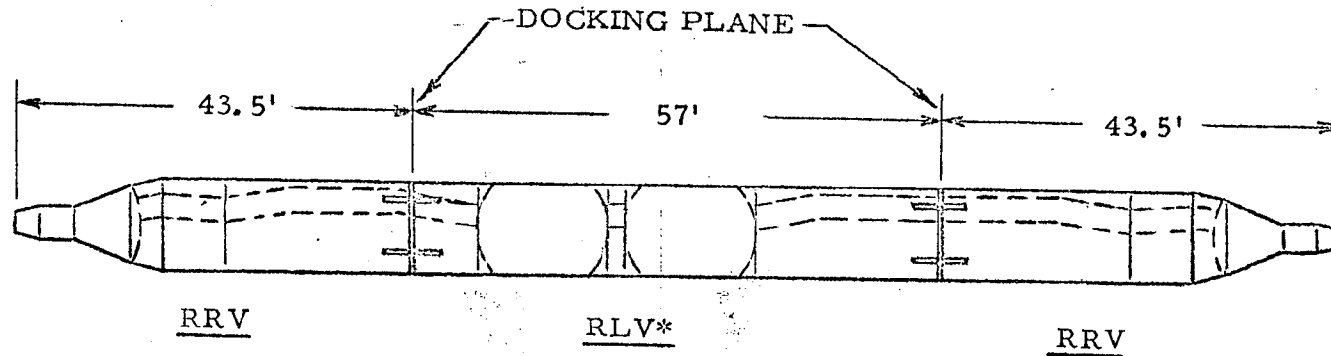
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SPECIAL HANDLING

FUNCTION DISTRIBUTION  
ORBITING CONFIGURATION



RRV FUNCTIONS  
(STORAGE END)

- o CREW TRANSPORT (STORAGE)

RLV FUNCTIONS

- o LIFE SUPPORT
- o ENVIRONMENTAL CONTROL
- o ACTS - REFERENCE
- o COMMUNICATIONS/DATA
- o BIO MED EQUIPMENT
- o EXPERIMENTS

RRV FUNCTIONS  
(ACTIVE END)

- o CREW TRANSPORT
- o ACTS - PROPULSION
- o PRIME ELECTRICAL POWER
- o LIFE SUPPORT EXPENDABLES
- o DATA RETURN SYSTEM
- o EXPERIMENTS
- o SPARE EQUIPMENT

~~D SECRET~~

\* RENDEZVOUS LABORATORY VEHICLE = R. O. V. LESS GEMINI B

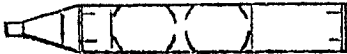




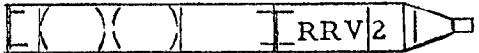
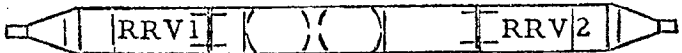
SPECIAL HANDLING



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4 MAN - DUAL COMPARTMENT CONCEPT  
POSSIBLE RENDEZVOUS/RESUPPLY OPERATIONS

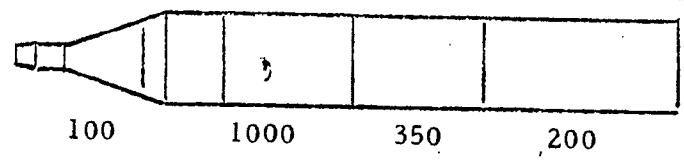
<u>TIME LINE</u> (DAY)	<u>FUNCTION</u>	<u>CREW</u>	<u>CONFIGURATION</u>
0-60	LAUNCH ROV & OPERATE	2	
60	LAUNCH RRV #1	2	
	RENDEZVOUS WITH ROV DOCK & OPERATE ROV SYSTEM	4	
120	LAUNCH RRV #2	2	
	RENDEZVOUS WITH ROV SEPARATE RRV #1 & STATION KEEP DOCK RRV #2 ON P/L COMPARTMENT SEPARATE GEMINI #1 & RETURN DOCK RRV #1 ON ROV/GEM I. F. OPERATE ROV SYSTEM	4	  
180	LAUNCH RRV #3 & SUBS. (REPEAT RRV SEQUENCE)		SAME AS RRV #2 CONFIG.

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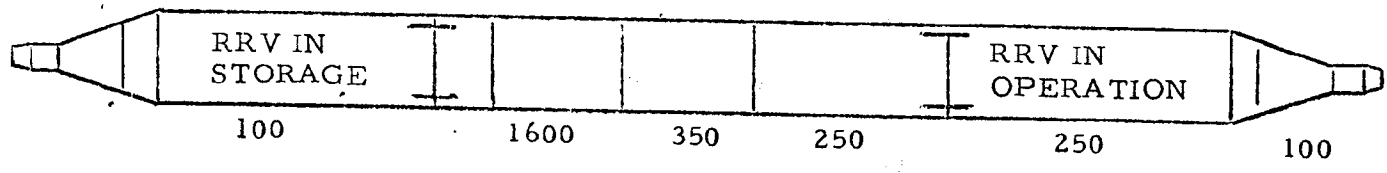
ESTIMATED ELECTRICAL POWER REQUIREMENTS  
(WATTS)

- 2 MAN DUAL COMPARTMENT VEHICLE - INTEGRAL LAUNCH



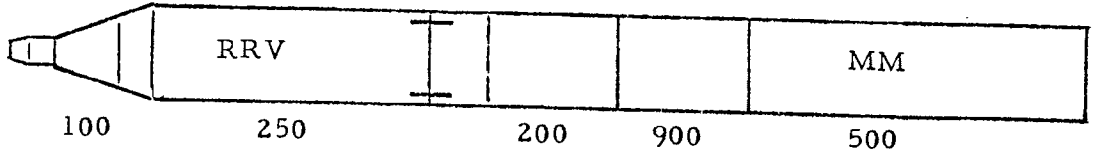
1650 WATTS

- 4 MAN DUAL COMPARTMENT VEHICLE - RENDEZVOUS (BIO TEST) -



2000 WATTS

- 2 MAN DUAL COMPARTMENT VEHICLE - RENDEZVOUS (COMBINED MISSION)



1950 WATTS

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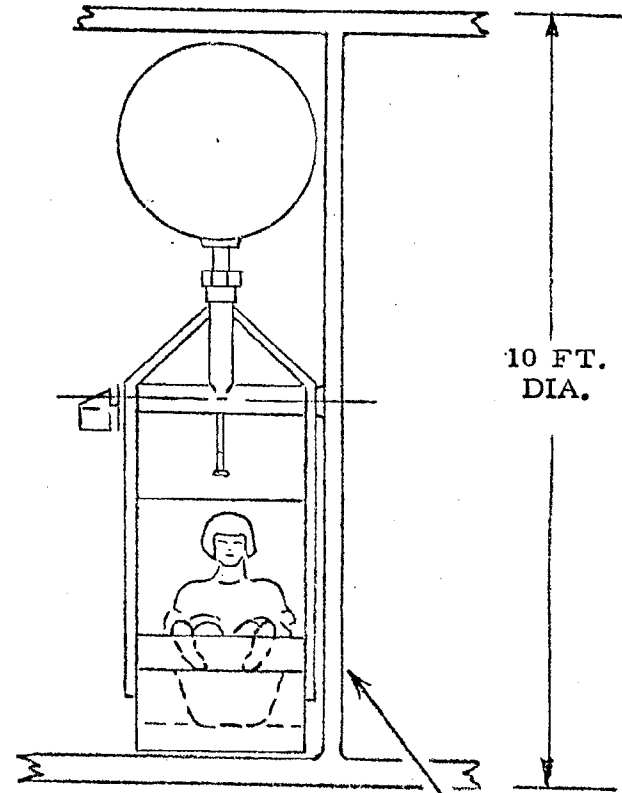
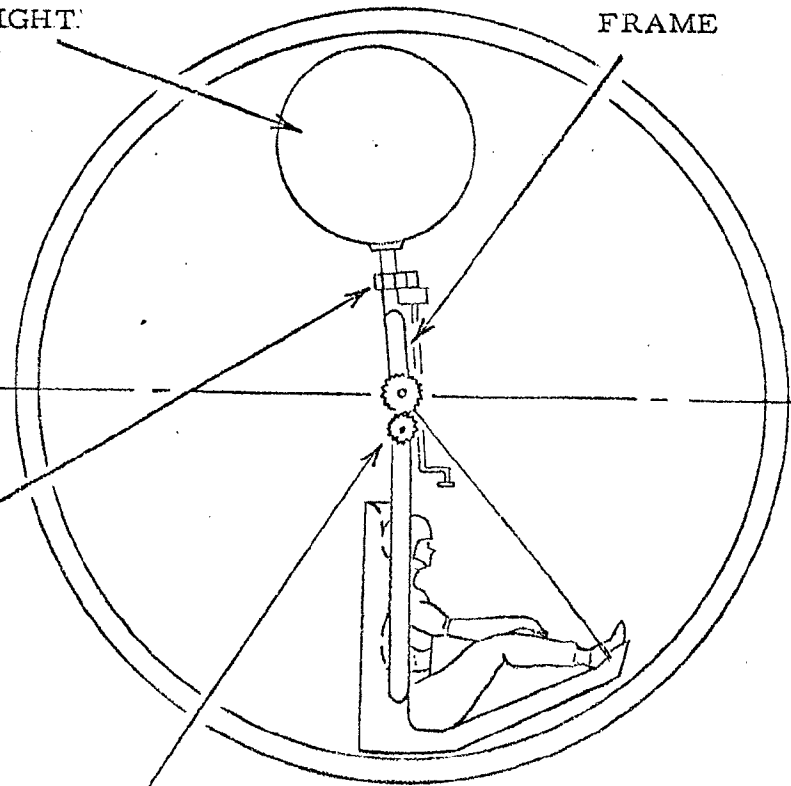
INTERNAL CENTRIFUGE CONCEPT

COUNTER WEIGHT  
(BALLAST)

FRAME

BALANCING  
MECHANISM

MOTOR DRIVE



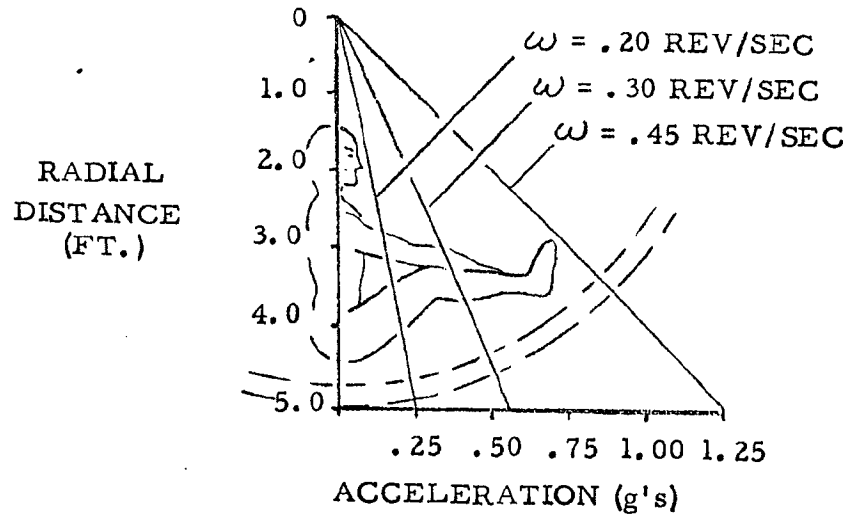
SUPPORT STRUCTURE

⊙ WEIGHT PENALTY = 400 LBS. PLUS ATTITUDE CONTROL REQUIREMENTS

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INTERNAL CENTRIFUGE  
ACCELERATION & ATTITUDE CONTROL FUEL CONSUMPTION



● FUEL CONSUMPTION FOR SPIN  
CYCLE DURATION - 600 SEC.

● SPIN/DESPIN	1.0
● GYRO COUPLING	0.3
TOTAL	<u>1.3 LBS.</u>

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