

Basaloni
TO Gehrig

BRIEFING OUTLINE

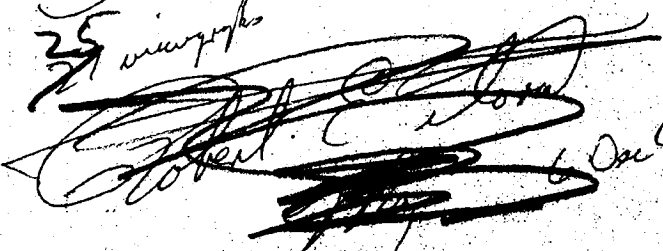
LEFT VIEWGRAPH

- ~~1. Contractor Responsibilities~~
- ~~2. Payload Characteristics~~
- ~~3. Error Budget~~

RIGHT VIEWGRAPH

- o ✓ 1. Title
- ✓ 2. Schedule
- ✓ 3. Inboard Profile - Manned Version
- ✓ 4. Inboard Profile
- ✓ 5. Mission Module
- 6. Mirror Technology
- 7. Tracking Mirror Gimbal Arrangement
- 8. Direct View & Tracking System
- 9. Acquisition Scope
- 10. Readout System
- ✓ 11. Payload Operations
- o 12. Lab Vehicle Arrangement
- ✓ 13. Attitude Control & TS
- ✓ 14. Environmental Control & Life Support
- o ✓ 15. Structural Arrangement *pulled out*
- ✓ 16. Electrical Power System
- ✓ 17. Communications & Data Handling
- ✓ 18. Gemini B
- o ✓ 19. Titan IIM (*pulled out*)
- ✓ 20. Current Weight Status
- ✓ 21. Aerospace Ground Equipment
- 22. Aerospace Ground Equipment
- ✓ 23. Laboratory Vehicle Flow
- ✓ 24. Factory Test Program
- ✓ 25. MOL Mission Simulator
- 26. LCC Master Control Room Equipments
- 27. Schedule Chart

Pittman viewgraphs

25 viewgraphs

6 Dec 66

Sampson's List

WFS-090 as of 11 January 1967

Classification

- | | | | |
|----|------|---|------------------|
| 1 | ✓ 1. | MOL Engineering Baseline Description | UNCL |
| | 1a. | Purpose of MOL/Dorian System | SSH |
| 3 | ✓ 2. | Inboard Profile | SSH. |
| 4 | ✓ 3. | Inboard Profile (Automatic) | SSH |
| 19 | 4. | T3 Picture | should be secret |
| 2 | 4a. | Current Launch Schedule | Unc. |
| 24 | 4b. | General Schedule | SSH |
| | 5. | System Capabilities | SSH |
| 5 | 6. | Mission Module | SSH |
| | 7. | Payload Characteristics | SSH |
| 11 | 8. | Payload Operating Capability | SSH |
| | 9. | Payload Sequence | SSH |
| | 10. | Sino Soviet Bloc Map | SSH |
| | 11. | Mission Control & Recovery | Confidential |
| | 12. | Orbit Altitude Control | SSH |
| | 13. | Altitude Versus Latitude | SSH |
| | 14. | Coverage Pattern at 40° Latitude | SSH |
| | 15. | First Day | SSH |
| | 16. | Day N. | SSH |
| | 17. | Ground Control | SSH |
| | 18. | MOL MCC | SSH |
| | 19. | Ascent Control | Uncl. |
| | 20. | Recovery | Uncl. |
| | 21. | East Fence Area | Uncl. |
| | 22. | West Fence Area | Uncl. |
| | 23. | | |
| | 24. | <i>Not Used anymore.</i> | |
| 18 | 25. | Gemini B <i>WEE 65-121466</i> | Confidential |
| 13 | 26. | Attitude Control & Translation System <i>WEE 65 121479</i> | Confidential |
| 14 | 27. | Environmental Control & Life Support <i>WEE 65 121479</i> | Confidential |
| 15 | 27a. | Structural Arrangement | Uncl. |
| 17 | 28. | Communications/Data Handling <i>AD 65 0000 02174 ex 42
WEE 65 121521</i> | Secret |
| 16 | 29. | Electrical Power System <i>WEE 65 121481</i> | Confidential |
| 20 | 30. | MOL Weight & Performance Summary | Uncl (?) |
| | 31. | Development Milestones | Uncl. |
| 23 | 32. | Lab Vehicle Hardware Flow | SSH |
| 21 | 33. | Aerospace Ground Equipment | SSH |
| | 34. | Requirements for Simulation | Uncl. |
| 25 | 35. | MOL Mission Simulator | Uncl. |

Received 1-27-67 C. H. H. H.

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30 Jan. 1967
Copy 1 of 1
Total Pages: 24

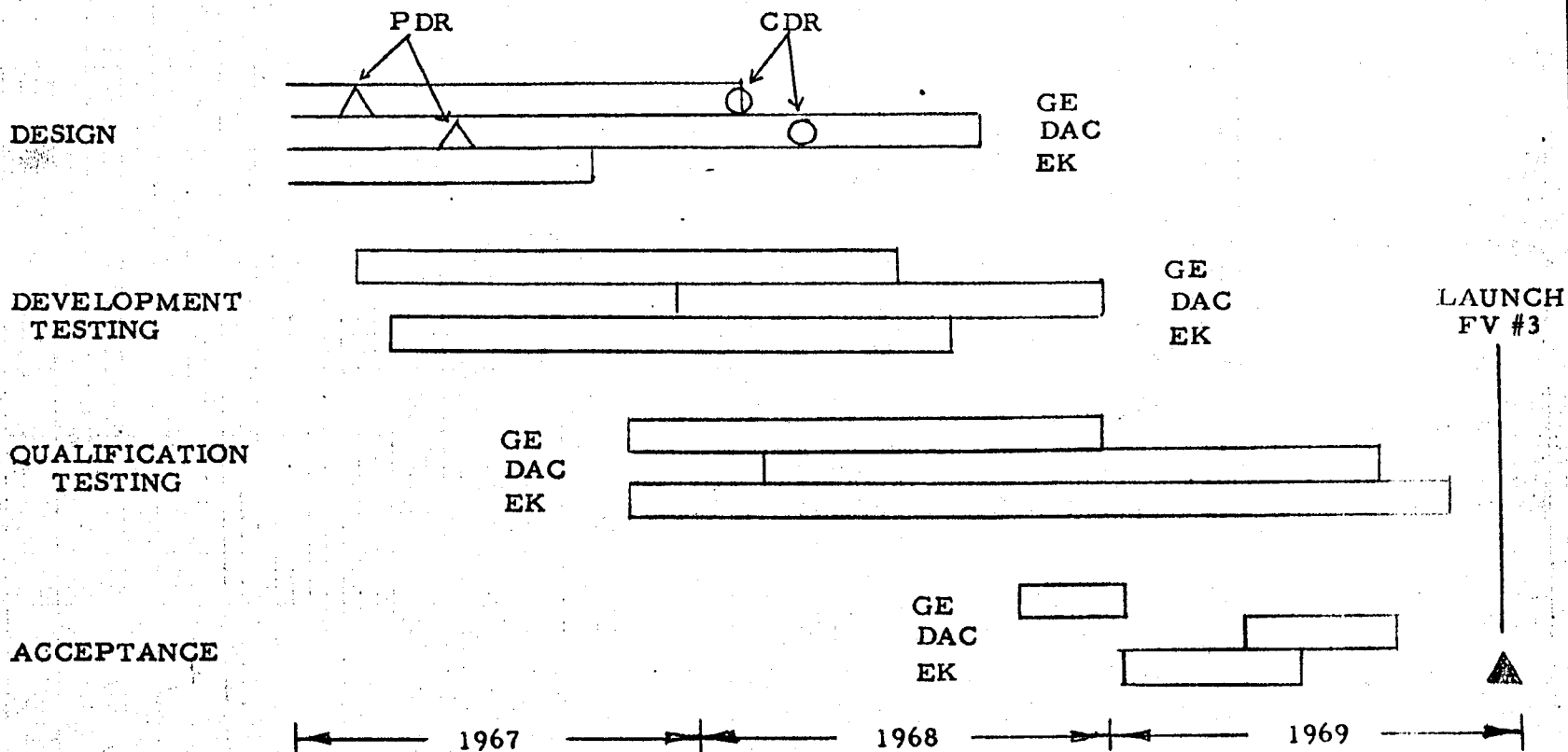
MOL ENGINEERING BASELINE DESCRIPTION

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HANDLING

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pg 2

GENERAL SCHEDULE

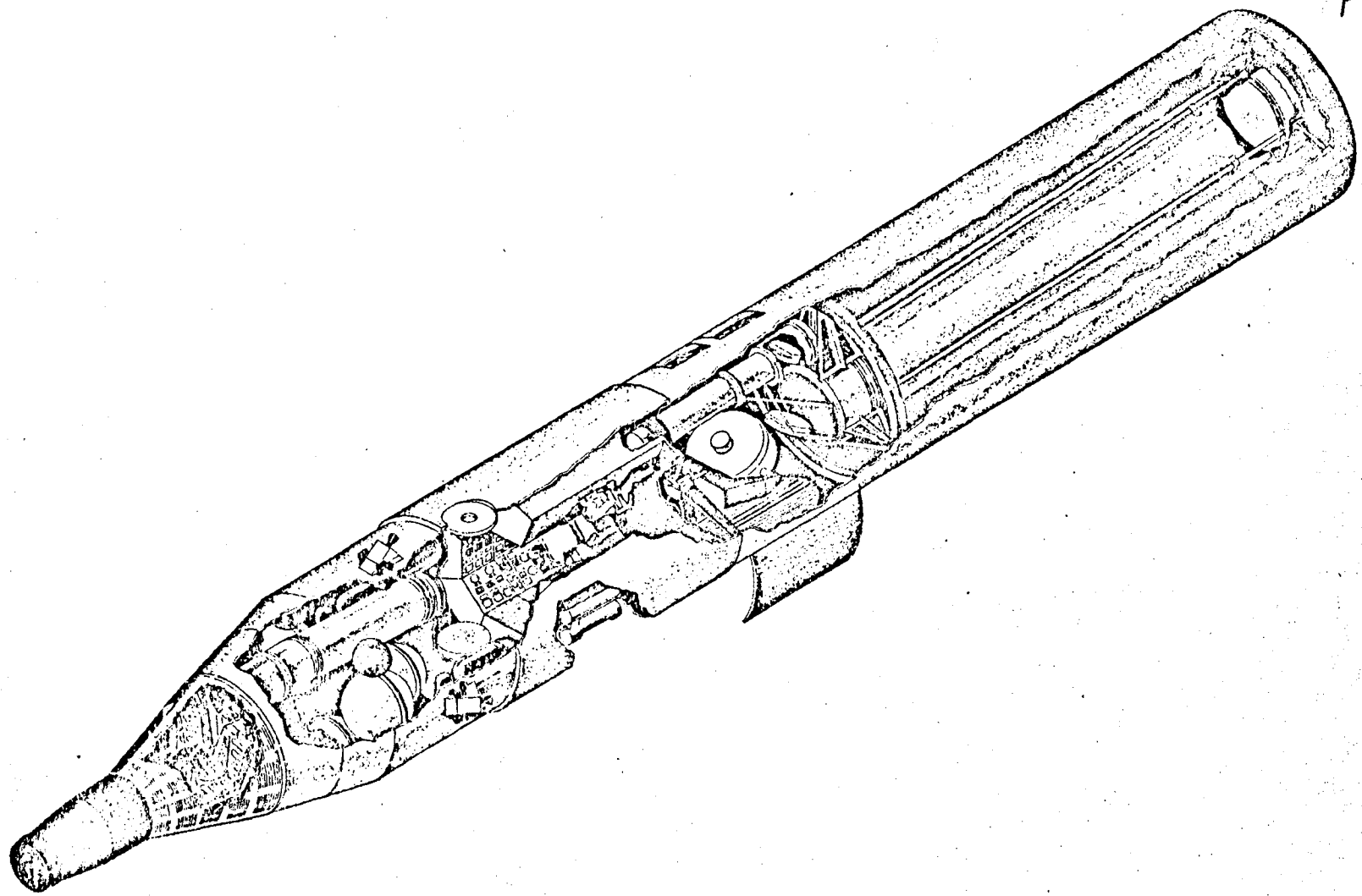


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pg 3

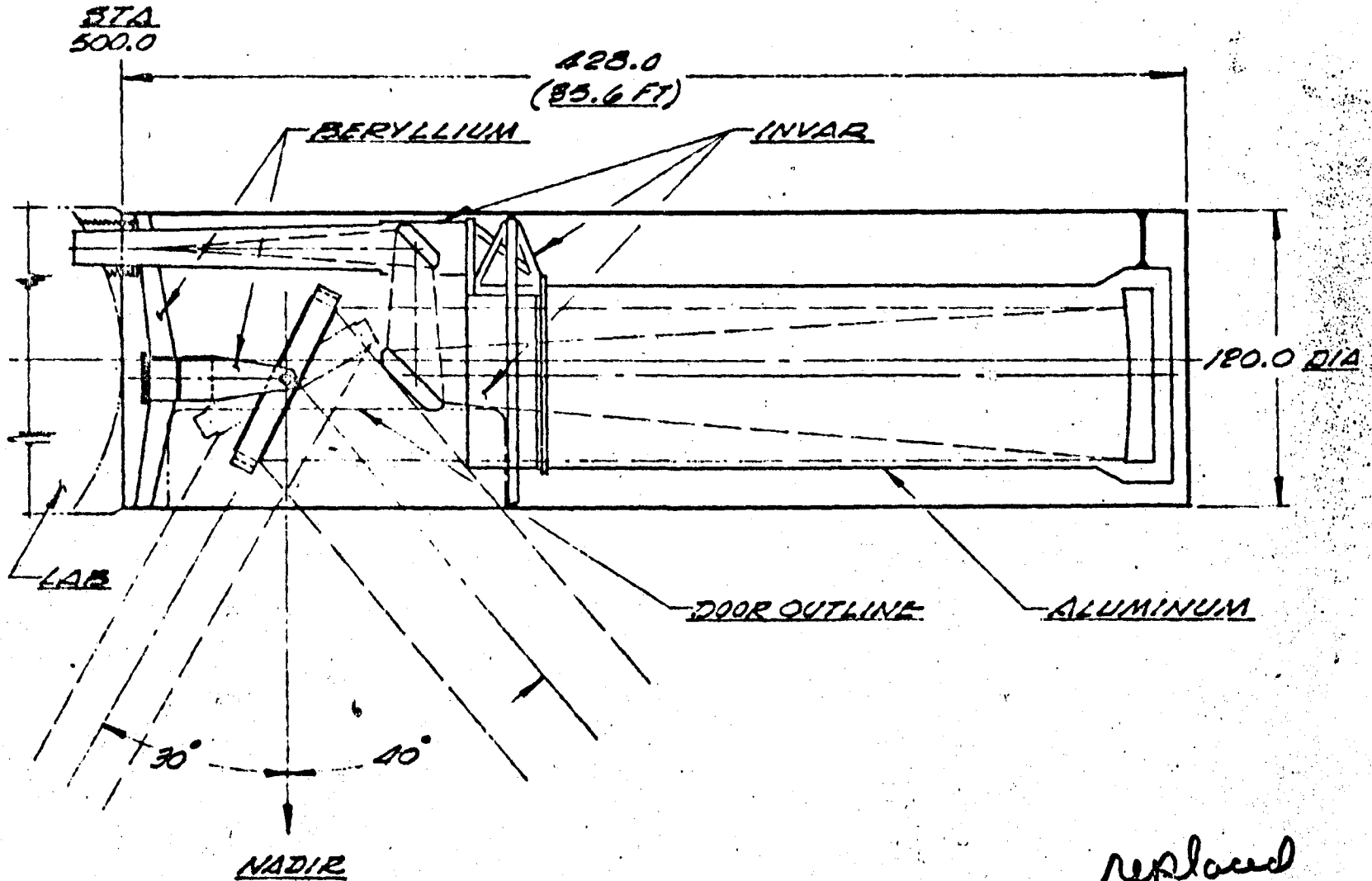


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p 4

MISSION MODULE



replaced
w/ color chart

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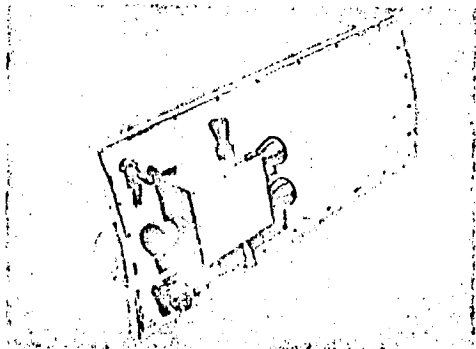
VEE-65-121489-R1111

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ATTITUDE CONTROL & TRANSLATION SYSTEM BASELINE LABORATORY VEHICLE

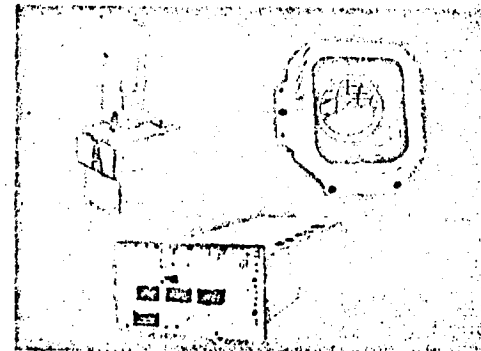


REACTION JETS



- 8-25 LBS
- 6-100 LBS
- RADIATION COOLED
- HYPERGOLIC BI-PROPELLANT
- MODULAR UNITS

ACTS. ELECTRONICS



- 0.5 DEG POINTING TOLERANCE
- 0.004 DEG/SEC RATE TOLERANCE
- MULTIPLE MODES, MANUAL AND AUTOMATIC
- COMPUTER INDEPENDENT ELECTRONICS; HORIZON SENSORS AND BMG REFERENCE

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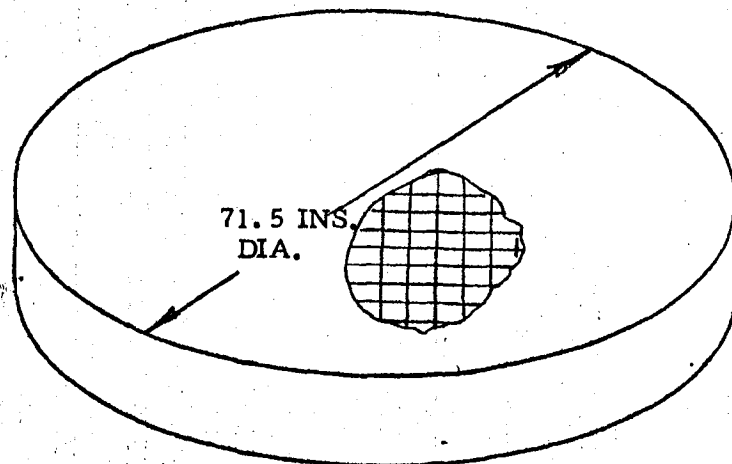
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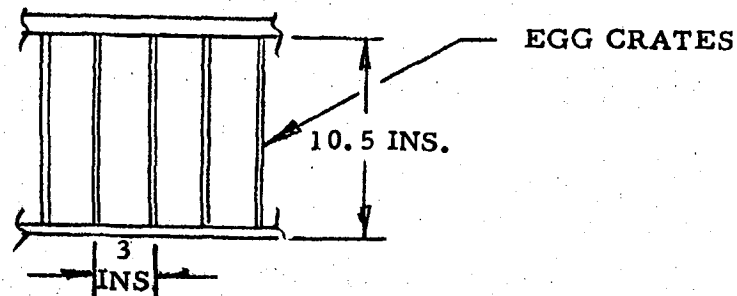
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MIRROR TECHNOLOGY



- PRIMARY AND TRACKING MIRRORS
- "EGG-CRATE" CONSTRUCTION
- MATERIAL - FUSED SILICA
- WEIGHT - 1020 LBS. EACH
- THICKNESS -
 - FACE PLATE 0.9 INS.
 - BACK PLATE 0.5 INS.
 - CORE 0.22 INS.
- OPTICAL TOLERANCE -
■ WAVE LENGTH



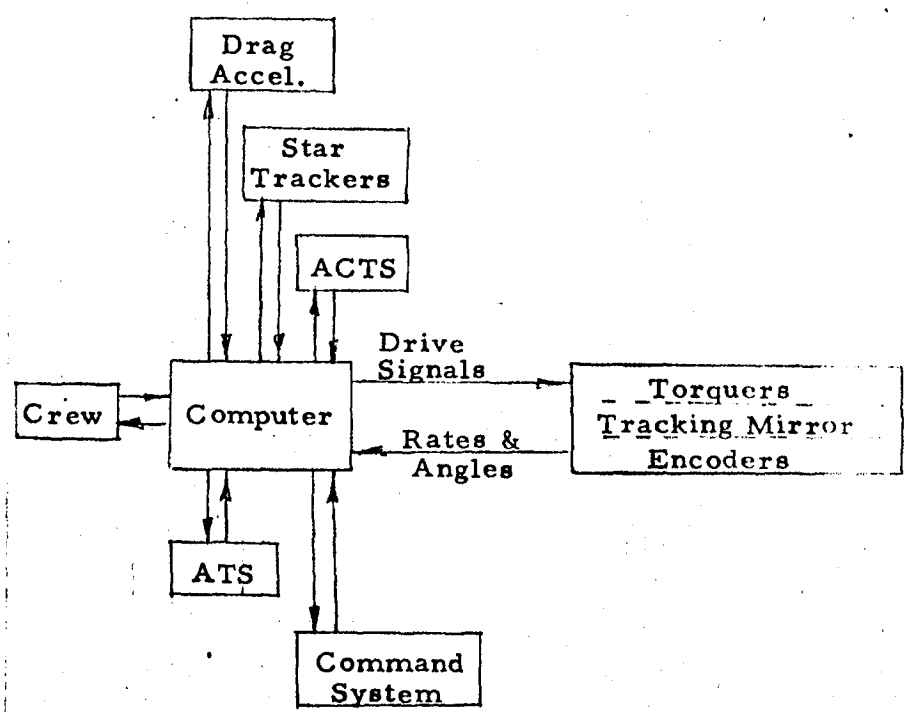
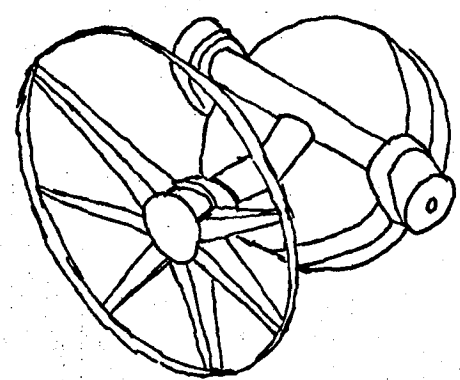
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p 7

TRACKING MIRROR GIMBAL SYSTEM



ACTS - ATTITUDE CONTROL/TRANSLATION SYSTEM
ATS - ACQUISITION & TRACKING SCOPE

BLOCK DIAGRAM

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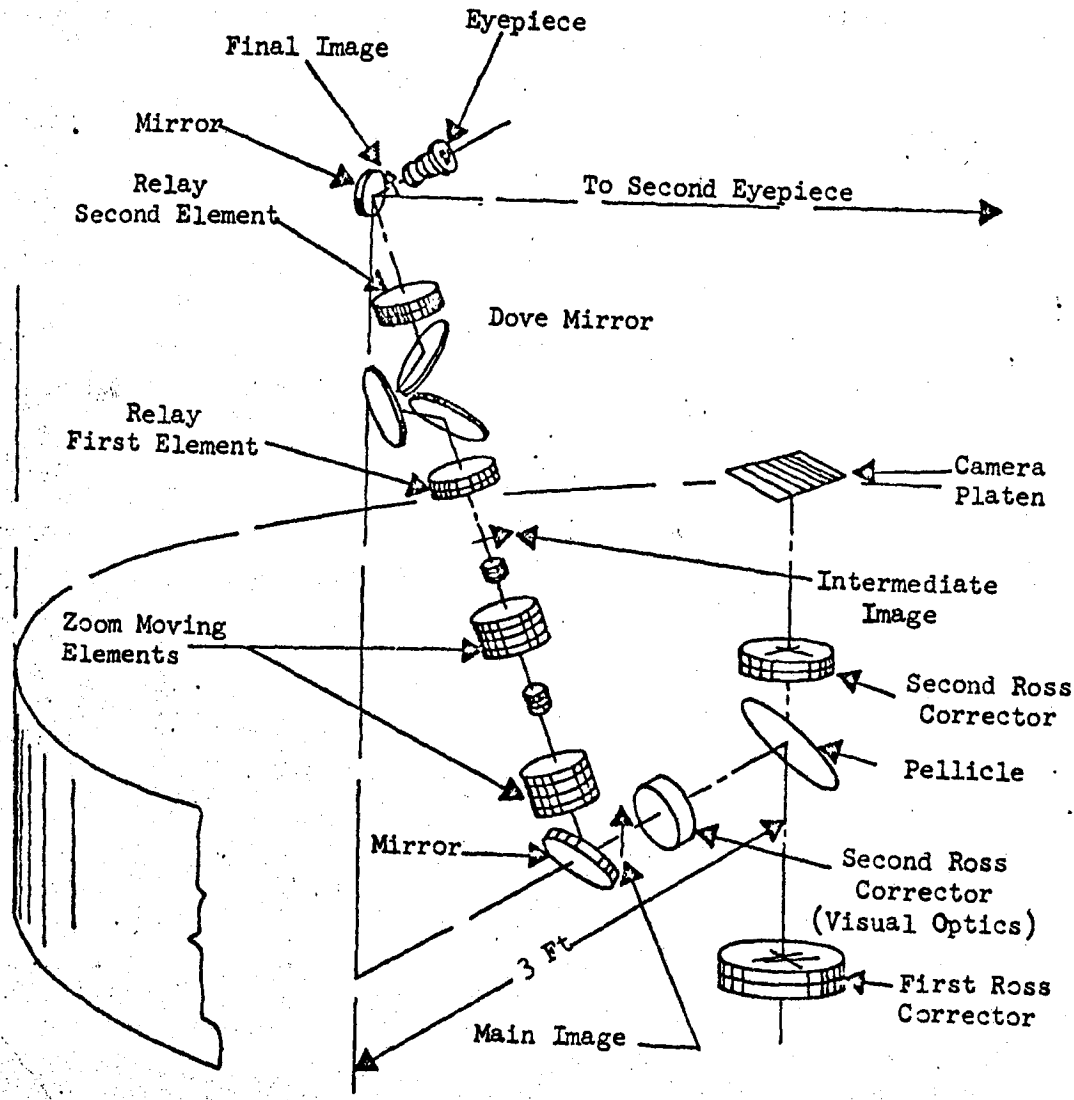
DIRECT VIEWING AND TRACKING SYSTEM

CHARACTERISTICS

FIELD OF VIEW - 40°

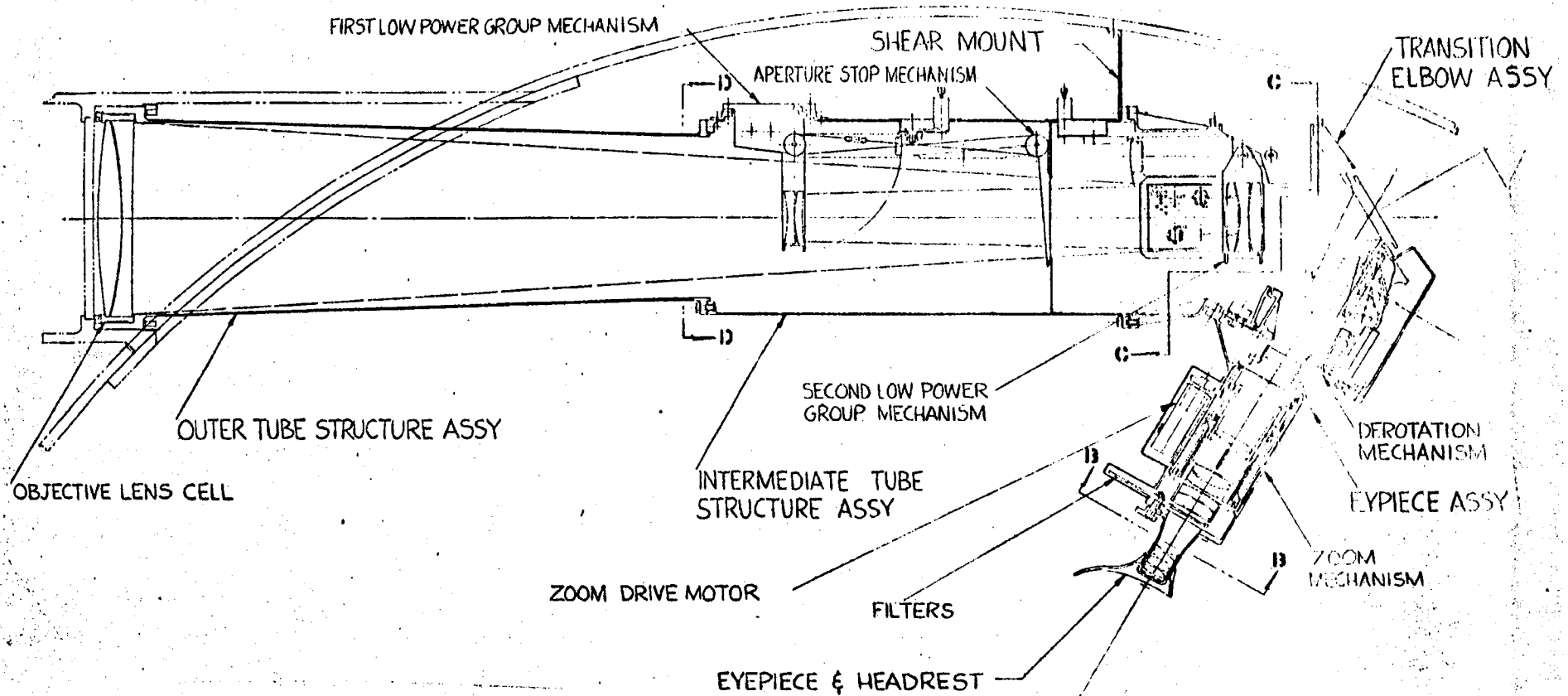
ZOOM RANGE - [REDACTED]

GROUND RESOLUTION [REDACTED]



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ACQUISITION AND TRACKING SCOPE



CHARACTERISTICS:

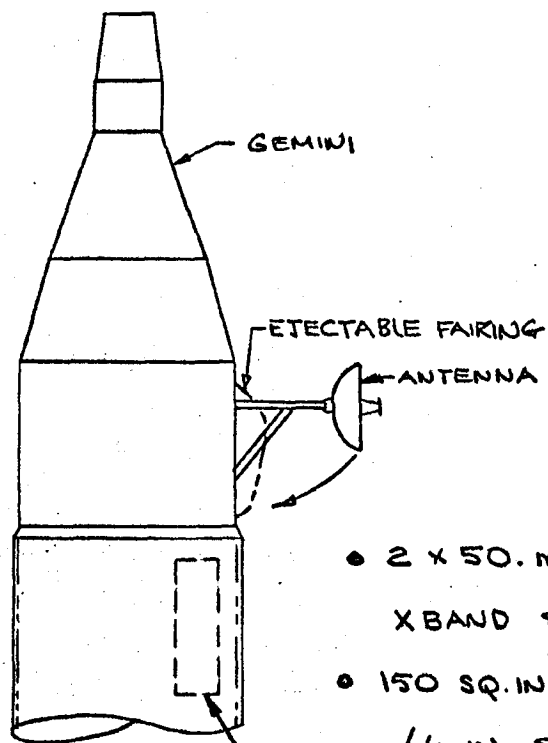
APERTURE 8" - 10"
ZOOM RANGE 60X - 120X
FOV 15X - 4°
120X - 0.5°

MAX. GROUND RESOLUTION ~ 3'
WEIGHT ~ 500 LB
PEAK POWER ~ 500W

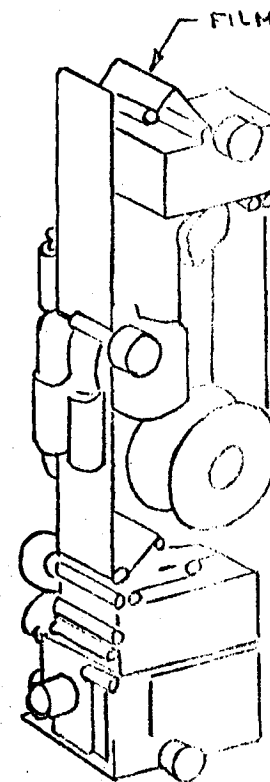
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WIDE BAND READOUT



- 2 x 50. mhz VIDEO CHANNELS
- X BAND STEERABLE ANTENNA - 3 FT. DISH
- 150 SQ. IN./MIN. FILM READOUT
(6 IN. SCAN WIDTH)
- SINGLE ZI GROUND STATION
- WEIGHT \approx 500 LBS
- PEAK POWER \sim 630 W



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PAYLOAD OPERATING CAPABILITY

ACQUISITION AND TRACKING TELESCOPE

LINE OF SIGHT SLEWING - 6 DEG/SEC

SETTLING TIME - 3 SEC

AUTOMATIC OPERATION - HANDS OFF OR UNMANNED

- PRECISION NAVIGATION
- PRECISION POINTING (STAR TRACKER)
- ELECTRO-OPTICAL IMAGE MOTION COMPENSATION

REAL TIME VISUAL OBSERVATION - MAIN OPTICS

AUXILIARY PLATEN - SECONDARY FILMS

READOUT - ANALOG - 800 IN.² PER DAY

ALIGNMENT - ANGULAR - 1 MIN, LINEAR - .001 IN.

FOCUS - AUTOMATIC - .001 IN. PLATEN POSITION ACCURACY

DATA RECOVERY - DRV - 60 LBS CAPACITY

GEMINI - 240 LBS CAPACITY

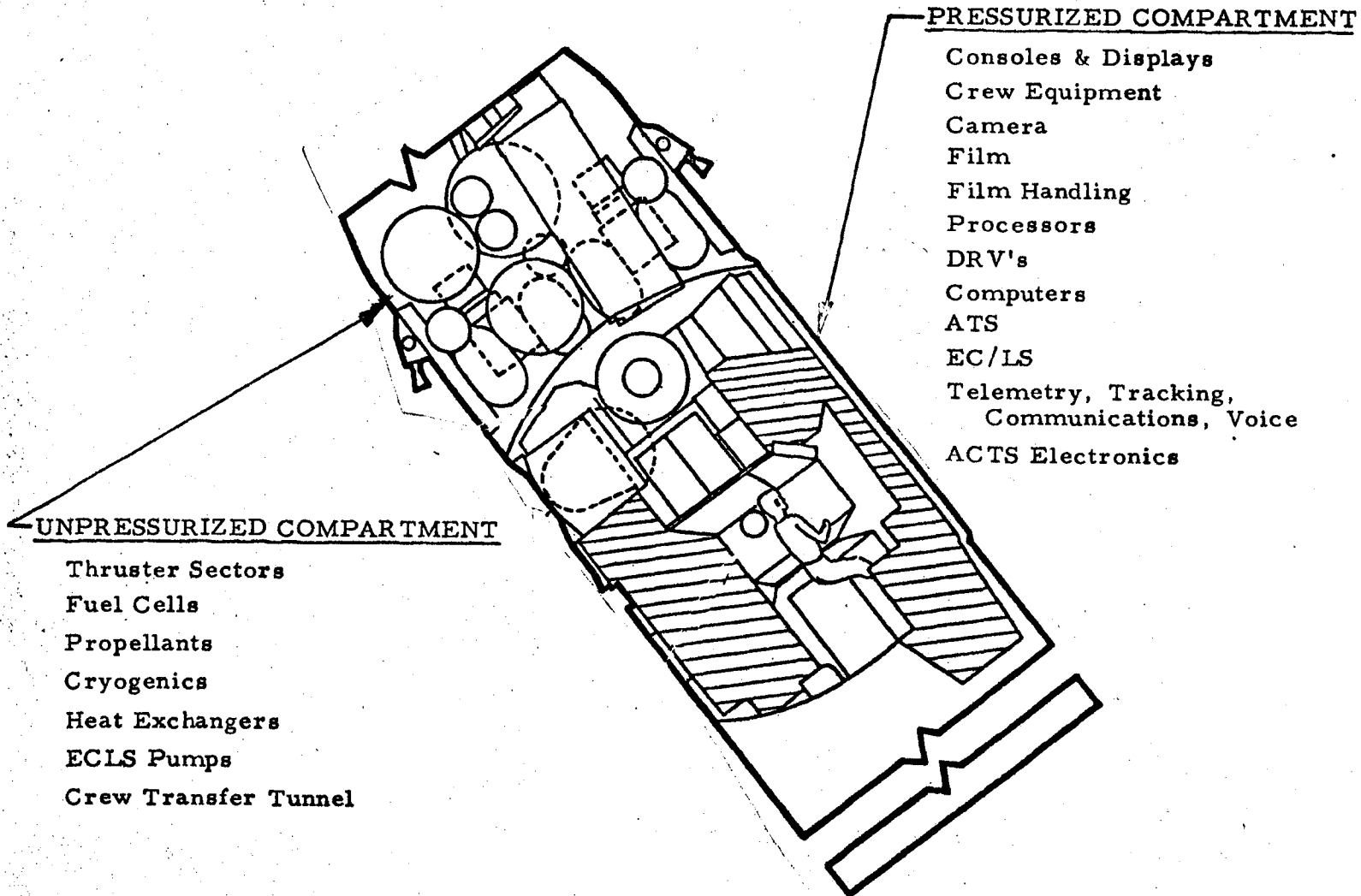
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LABORATORY VEHICLE ARRANGEMENT



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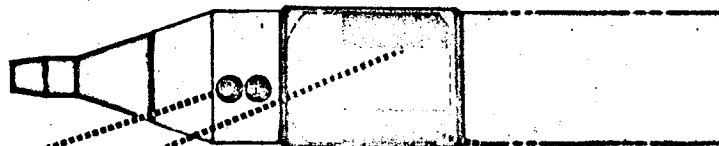
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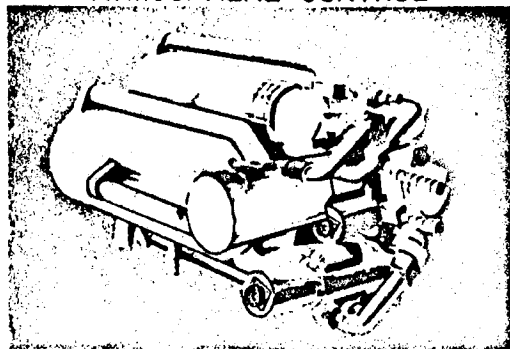
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ENVIRONMENTAL CONTROL AND LIFE SUPPORT BASELINE LABORATORY VEHICLE

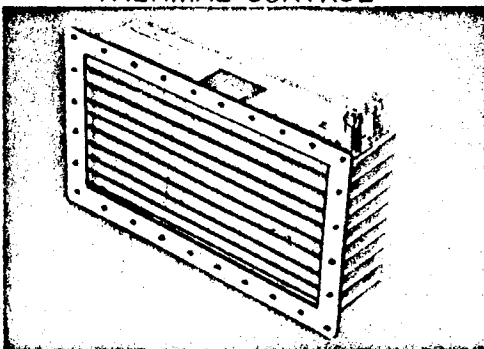


ATMOSPHERE CONTROL



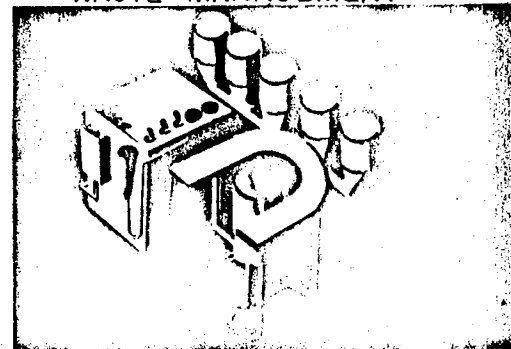
- DUAL GAS ATMOSPHERE, O₂ BACK-UP
- 5 PSIA O₂/He₁ "SHIRTSLEEVE"
- SUPERCRITICAL O₂ STORAGE
- MOLECULAR SIEVE FOR CO₂ CONTROL
- 5 MINUTE COMPARTMENT REPRESSURIZATION
- OPEN SUIT LOOP FOR EMERGENCY

THERMAL CONTROL



- HEAT EXCHANGERS & COLDPLATES
- INNER WALL HEATING
- SPACE RADIATOR

WASTE MANAGEMENT



- COLLECT METABOLIC WASTES
- PROCESS & STORE WASTE MATTER
- VACUUM DEBRIS COLLECTION

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MOL

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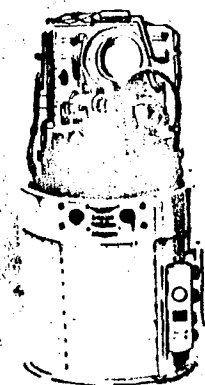
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ELECTRICAL POWER SYSTEM BASELINE LAB VEHICLE



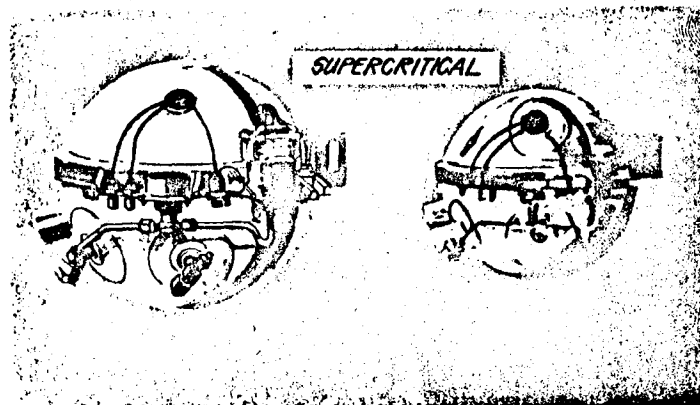
FUEL CELL



APOLLO TYPE

- THREE 1,000 HR. FUEL CELL MODULES
- 2.0 KW AVERAGE POWER
- 4.5 KW PEAK POWER

CRYOGENIC STORAGE



- TWO H₂ AND TWO O₂ TANKS
- 30 DAY CAPACITY

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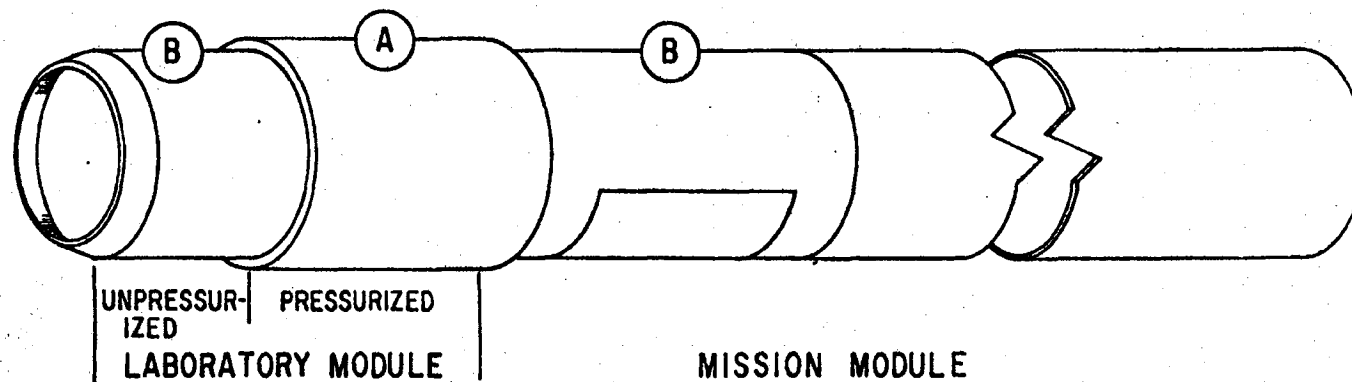
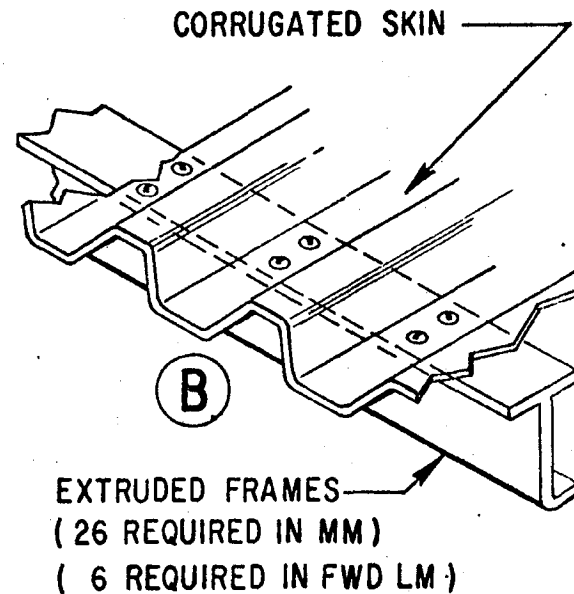
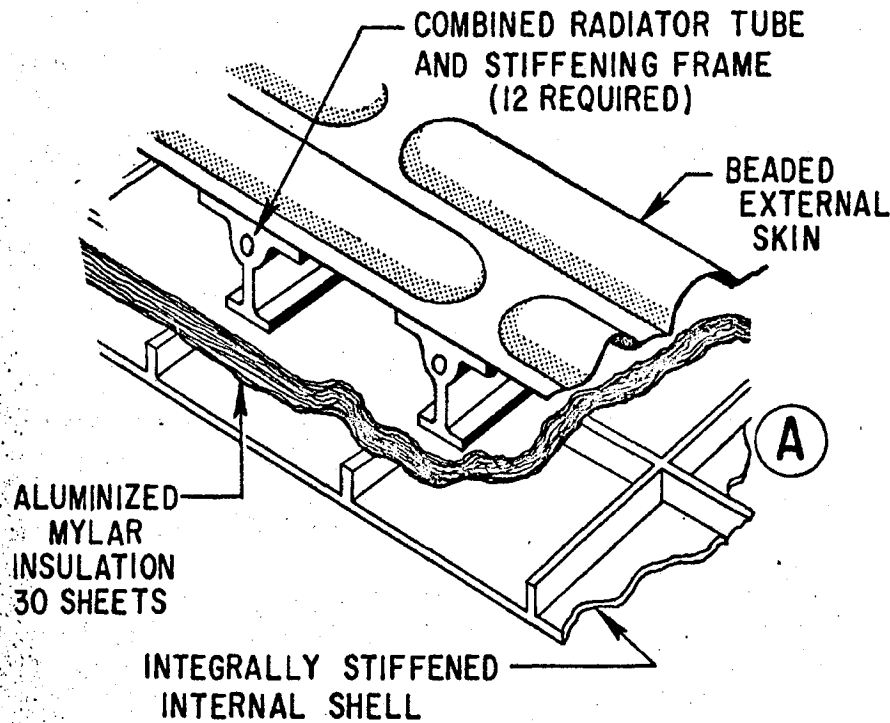
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STRUCTURAL ARRANGEMENT

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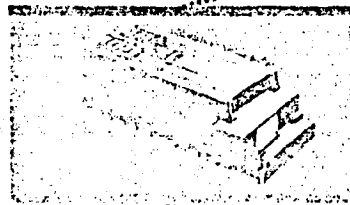
MOL

~~SECRET~~

REF ID: A1521-8111
AD65 0000 0474 025

COMMUNICATIONS / DATA HANDLING

BASELINE LAB VEHICLE



SGLS

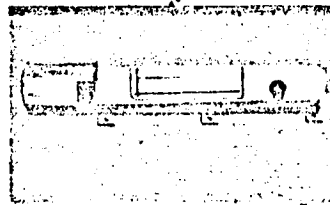
- TRACKING - R, R, A
- TELEMETRY

REAL TIME - 64 KBPS
STORED - 1024 KBPS

- COMMAND - 1 KBPS

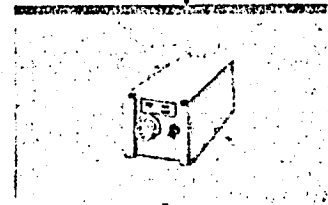
REAL-TIME
STORED DATA

- VOICE - **DUPLX**



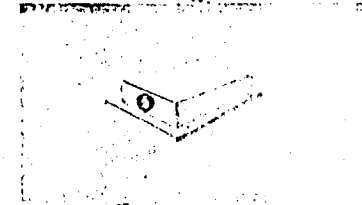
WIDEBAND DATA

- 20 MBPS



BACK-UP TELEMETRY

- STATUS DATA



BACK-UP COMMAND

- 1 KBPS

SECURITY

CONDITION / MULTIPLEX / RECORD
MONITOR / ALARM
TIMING

TELEPRINTER

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REF-61-121464-R



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GEMINI B

NEW, LIGHTER,
SHORTER STRUCTURE

ADD CREW TRANSFER
HATCH AND TUNNEL

RETRO SEPARATION
PLANE

TWO ADDITIONAL
RETRO MOTORS

BATTERIES
14 HR LOITER

BATTERIES

ELECTRONIC
EQUIPMENT

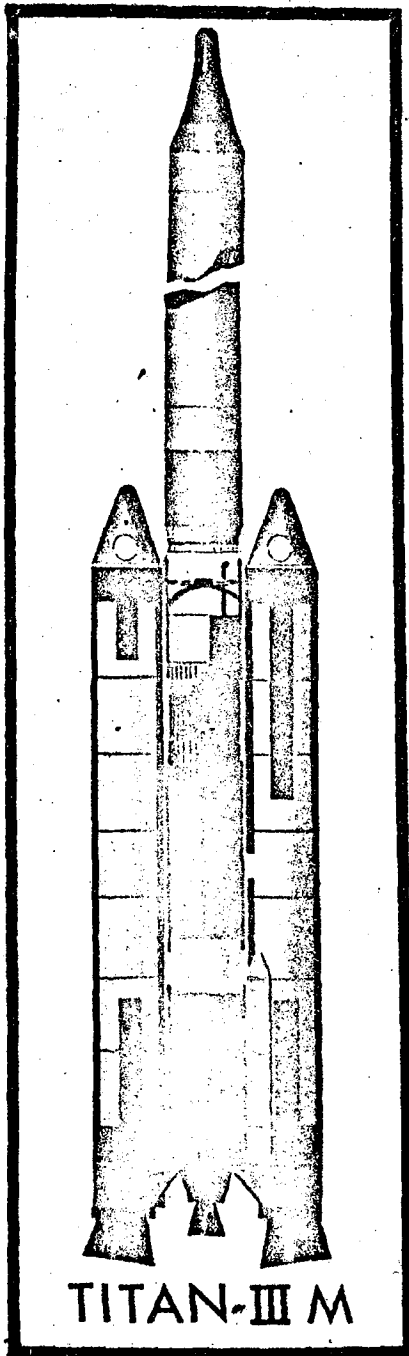
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TITAN IIIM DESCRIPTION

MAJOR FEATURES

- PERFORMANCE
32,800 LBS @ 80°-80/130 N. MI.
- TOTAL THRUST AT LIFTOFF - 3 MILLION POUNDS
- 7 - SEGMENT SOLIDS
- CORE - 2 STAGES
NO TRANSTAGE
STAGE 1 ENGINES - 15:1 NOZZLE EXPANSION RATIO
- REDUNDANT FLIGHT CONTROL SYSTEM
- BOOSTER INERTIAL GUIDANCE SYSTEM DURING ASCENT
(BIGS)
- GEMINI INERTIAL GUIDANCE SYSTEM BACKUP
(GIGS)

Handwritten notes:
1/18/54
1/18/54

[REDACTED]

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MOL WEIGHT AND PERFORMANCE SUMMARY

	<u>BASELINE WEIGHT (LBS)</u>	<u>CURRENT STATUS (LBS)</u>
<u>GEMINI B</u>	<u>6,068</u>	<u>6,110</u>
GEMINI B SEGMENT	5,630	5,669
CREW	360	360
PRESSURE SUIT ASSEMBLY	81	81
<u>LABORATORY VEHICLE</u>	<u>14,000</u>	<u>14,166</u>
LABORATORY MODULE	12,048	12,214
MISSION MODULE STRUCTURE	1,952	1,952
<u>MISSION PAYLOAD</u>	<u>8,439</u>	<u>8,441</u>
MISSION MODULE EQUIPMENT	6,226	6,208
LABORATORY MODULE EQUIPMENT	2,213	2,153
<u>TOTAL ORBITAL VEHICLE</u>	<u>28,507</u>	<u>28,717</u>
L. V. CAPABILITY (80°, 80/180, 55°N. WTR, T-IIM)		32,270
<u>PAYLOAD MARGIN</u>	<u>3,763</u>	<u>+3,553</u>

30
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AEROSPACE GROUND EQUIPMENT

COMPLETE CHECKOUT OF EACH SYSTEM SEGMENT

T-IIIIM	}	INDIVIDUAL SEGMENT AGE
		DESIGNS EXISTING
GEMINI B	}	USE AS IS

LABORATORY MODULE	}	SEPARATE, COMPUTER CONTROLLED
		OPERATE TOGETHER

MISSION PAYLOAD - OVERALL SYSTEM TEST

- IDENTICAL AGE AND TEST PROCEDURES, FACTORY & PAD
- OPTICAL TESTING AT ROCHESTER ONLY

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replaced w/ lab

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FACTORY TEST PROGRAM

CONTRACTOR TESTS

TEST SPECIMEN

GE

EK

DAC

MMFS # 1F *	THERMAL	THERMAL	
2F *	STRUCTURAL DYNAMIC	ACOUSTIC	STRUCTURAL = DYNAMIC/STATIC
3F	DEVELOPMENT		
4F	BUILDUP ONLY	DEVELOPMENT	
5F	QUALIFICATION	QUALIFICATION	QUALIFICATION (EMC ONLY)
MMAS # 1A		ACOUSTIC	STRUCTURAL = DYNAMIC/STATIC
2A		THERMAL	
3A		DEVELOPMENT	
4A		QUALIFICATION	
LM # 1			ACOUSTIC/DYNAMIC/STATIC
# 2			QUALIFICATION

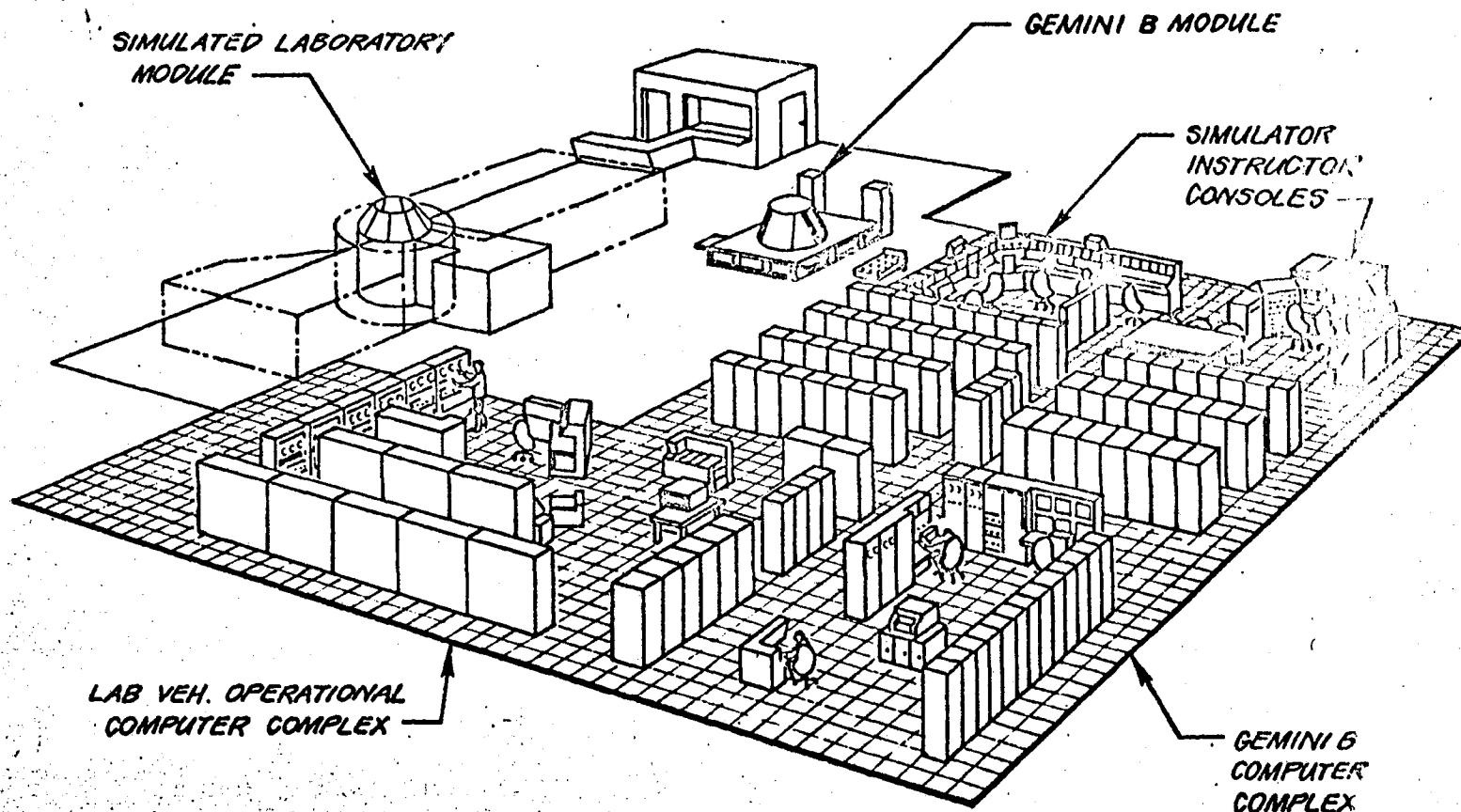
* NON-PRIME

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MOL MISSION SIMULATOR

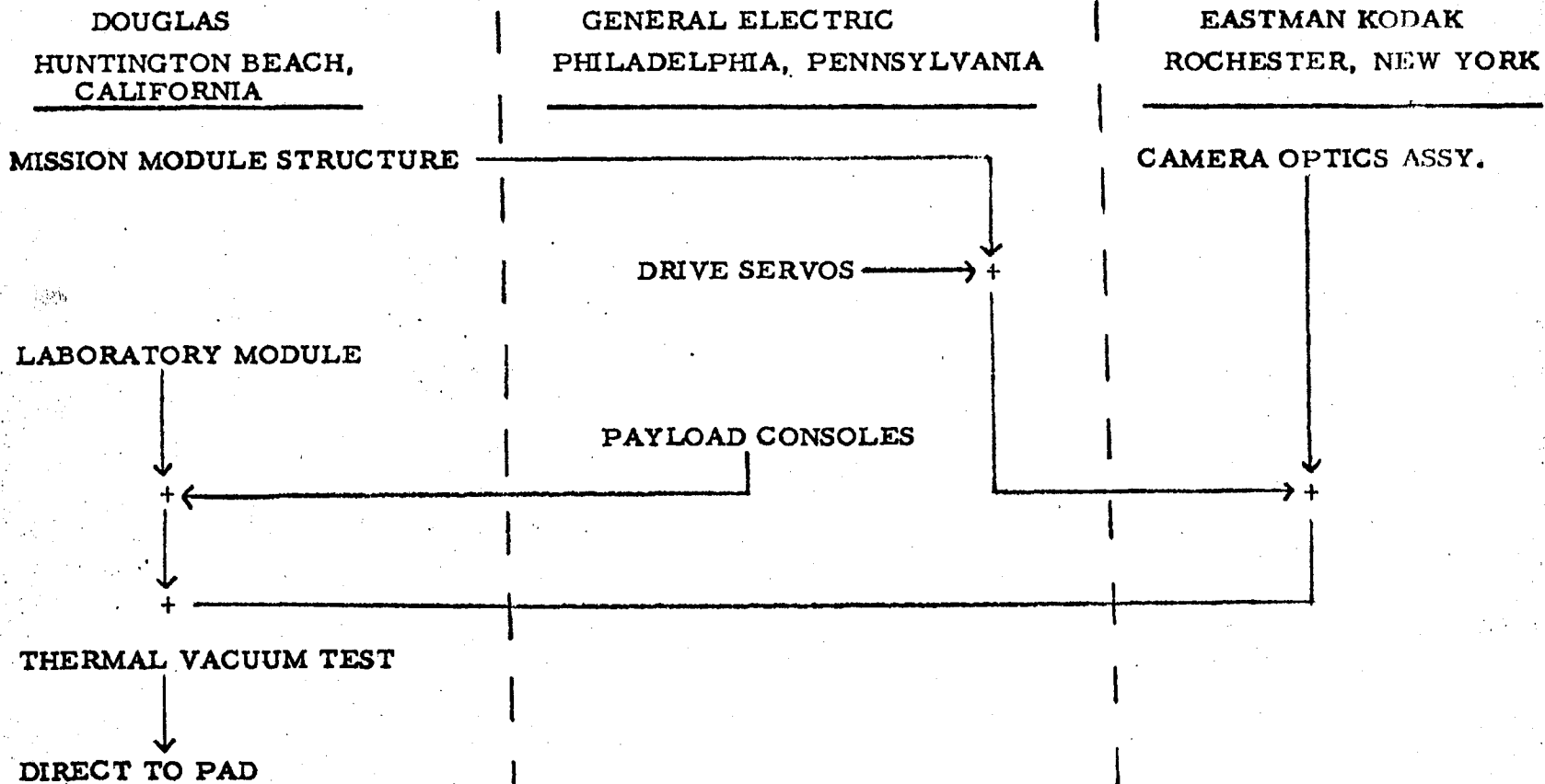


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LABORATORY VEHICLE HARDWARE FLOW



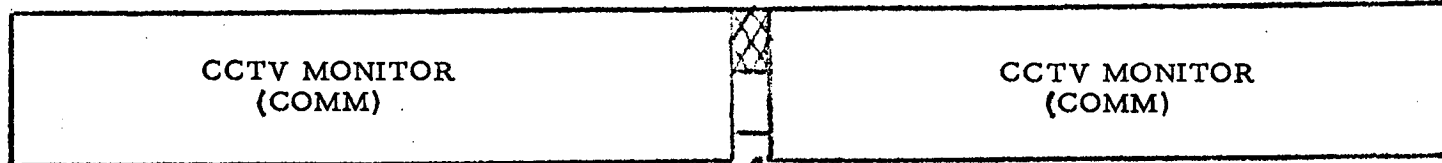
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replaced w/ alt



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LCC MASTER CONTROL ROOM
HARDWARE



COUNTDOWN
READOUT
(COMM)

