MOL TECHNICAL STATUS SUMMARY

BRIEFING TO GEN FERGUSON

9 JANUARY 1969
MOL TECHNICAL STATUS

SUMMARY
THIM CURRENT PERFORMANCE STATUS

PAYLOAD CAPABILITY
(DATA BOOK, REV 19) 31,074

PENDING WEIGHT CHANGES -98

MOL REQUIREMENT 30,850

PREDICTED ADDITIONAL CAPABILITY +126 LB

REFERENCE ORBIT 80 N. MI. - 187 N. MI., 90° INCLINATION
45° N LATITUDE PERIGEE

SECRET/DOULAN
ORBITING VEHICLE WEIGHT HISTORY

- SPEC. WEIGHT, INCLUDING PENDING CHANGES
- CURRENT WEIGHT, INCLUDING PENDING CHANGES
- SPEC. WEIGHT

WEIGHT - 1000 POUNDS

JULY | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC | JAN

1967 | 1968

WEIGHT: 28, 29, 30, 31

DATE: JULY 1967 - JANUARY 1968
### ORBITING VEHICLE SYSTEM SEGMENT WEIGHT SUMMARY

**1 JANUARY 1989**

<table>
<thead>
<tr>
<th>SYSTEM SEGMENT AVE (INCLUDING GFE)</th>
<th>FLIGHT WEIGHT SPEC</th>
<th>ACTUAL</th>
<th>% OF CURRENT WEIGHT</th>
<th>ESTIMATED</th>
<th>CALCULATED</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC AVE &amp; GFE</td>
<td>5944</td>
<td>5930</td>
<td>16</td>
<td>72</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>DAC AVE &amp; GFE</td>
<td>14704</td>
<td>14376</td>
<td>42</td>
<td>45</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>GE AVE &amp; GFE</td>
<td>2045</td>
<td>2851</td>
<td>45</td>
<td>54</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>EK AVE</td>
<td>5769</td>
<td>6000</td>
<td>6</td>
<td>26</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>HS PSA AVE</td>
<td>156</td>
<td>156</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>WHIRLPOOL - FOOD</td>
<td>102</td>
<td>102</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FLIGHT CREW</td>
<td>360</td>
<td>360</td>
<td>160</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ORBITING VEHICLE</td>
<td>29000</td>
<td>29575</td>
<td>31</td>
<td>47</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>UNALLOCATED GROWTH</td>
<td></td>
<td></td>
<td>217</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OV PLUS UNALLOCATED GROWTH</td>
<td>29,880</td>
<td>29,792</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THIM CAPABILITY:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90° INC, 20/187 NM, L.A.T. 45° N</td>
<td>10,850</td>
<td>30,976</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAYLOAD MARGIN</td>
<td>970</td>
<td>1,104</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESERVE PAYLOAD DELTA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 MARK V DRV</td>
<td>475</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIDEBAND SCAN SYSTEM</td>
<td>485</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) PREDICTED FLIGHT WEIGHT BASED ON CURRENT REQUIREMENTS INCLUDING PENDING DESIGN CHANGES AND UNALLOCATED GROWTH.
EPS FUEL CELL STATUS

- APOLLO MODIFIED BACON TYPE (400°F) FUEL CELL CHANGED TO NASA AAP MATRIX TYPE (190°F) FUEL CELL.

- PROGRAM ADVANTAGES
  - POWER INCREASE
  - DOUBLE LIFE (2000 HOURS)
  - WEIGHT SAVINGS (200 LBS.)
  - ON-ORBIT START UP AND SHUT DOWN CAPABILITY
  - DELETE POWER SWITCHING CONTROL UNIT
  - ELIMINATE VOLTAGE CLIPPING
  - SIMPLIFY OPERATIONS AND MAINTENANCE

- PROGRAM STATUS
  - CEI CHANGES BEING INCORPORATED BY ECP
  - FUEL CELL TRS PRESENTLY UNDER REVIEW
  - FUEL CELL PDR SCHEDULED 3 FEBRUARY
### OV Peak and Average Power

<table>
<thead>
<tr>
<th></th>
<th>Allocation</th>
<th>10-15 Last Report</th>
<th>12-15 This Report</th>
<th>Change from Last Report</th>
<th>Variance with Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Power (Watts)</td>
<td>1822</td>
<td>1609</td>
<td>1611</td>
<td>+ 2</td>
<td>- 211</td>
</tr>
<tr>
<td>Peak Power (Watts)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A) Tracking Mirror Slew</td>
<td>4326</td>
<td>3954</td>
<td>3841</td>
<td>- 113</td>
<td>- 485</td>
</tr>
<tr>
<td>B) Photographic Operations</td>
<td>4426</td>
<td>4160</td>
<td>4019</td>
<td>- 141</td>
<td>- 407</td>
</tr>
<tr>
<td>C) Mission Payload Checkout</td>
<td>4370</td>
<td>4102</td>
<td>4056</td>
<td>- 46</td>
<td>- 314</td>
</tr>
<tr>
<td>D1) Mission Payload Activation/Preparation</td>
<td>4301</td>
<td>4105</td>
<td>4014</td>
<td>- 91</td>
<td>- 287</td>
</tr>
<tr>
<td>D2) Other Mission Payload Operation</td>
<td>4209</td>
<td>3697</td>
<td>3669</td>
<td>- 28</td>
<td>- 543</td>
</tr>
<tr>
<td>E) SGLS Station</td>
<td>3342</td>
<td>3129</td>
<td>3149</td>
<td>+ 20</td>
<td>- 193</td>
</tr>
<tr>
<td>F) Wideband Station</td>
<td>3851</td>
<td>3339</td>
<td>3359</td>
<td>+ 17</td>
<td>- 492</td>
</tr>
<tr>
<td>G) SGLS &amp; Wideband Stations</td>
<td>3937</td>
<td>3727</td>
<td>3748</td>
<td>+ 21</td>
<td>- 189</td>
</tr>
<tr>
<td>H) All Other Orbital</td>
<td>4196</td>
<td>3857</td>
<td>3850</td>
<td>- 7</td>
<td>- 346</td>
</tr>
<tr>
<td>I) Early or Late Orbit</td>
<td>4439</td>
<td>4102</td>
<td>4126</td>
<td>+ 24</td>
<td>- 313</td>
</tr>
<tr>
<td>J) Launch and Ascent</td>
<td>2791</td>
<td>2260</td>
<td>2289</td>
<td>+ 29</td>
<td>- 502</td>
</tr>
</tbody>
</table>

**Capability (Watts Estimated)**

- Average: 2310 Watts
- Peak: 5080 Watts

Handle via Byeman Control System Only
LOADS CYCLE HISTORY

○ LOADS CYCLE 1 (COMPLETED APRIL '66)
  / STATIC ELASTIC
  / 8 MASS OV MODEL
  / ALL TRANSIENT CONDITIONS EXAMINED

○ LOADS CYCLE 2 (COMPLETED NOV '66)
  / STATIC ELASTIC - UP-DATED VEHICLE EXTERNAL CONFIGURATION
  / 15 SPRUNG MASS OV MODEL
  / ALL TRANSIENT CONDITIONS EXAMINED

○ LOADS CYCLE 3 (COMPLETED MAY '67)
  / STATIC ELASTIC - UP-DATED SHELL STIFFNESS/VEHICLE EXTERNAL CONFIGURATION
  / 15 SPRUNG MASS OV MODEL - UP-DATED IN DEGREES OF FREEDOM
  / SELECTED TRANSIENT CONDITIONS EXAMINED
    ○ STAGE I SHUT-DOWN
    ○ THRUST TERMINATION

○ LOADS CYCLE 4 (COMPLETED JAN '69)
  / STATIC ELASTIC - BASELINE EXTERNAL CONFIGURATION
  / 110 SPRUNG MASS OV MODEL - 613 DEGREES OF FREEDOM
  / ALL TRANSIENT CONDITIONS EXAMINED
STRUCTURES STATUS - MAJOR MILESTONES

- **MDAC-WD**
  - **LAB MODULE**
    - FWD UNPRESS. COMPARTMENT - LIMIT LOAD STATIC TEST
      COMPLETED 30 NOV 68
    - ULT LOAD STATIC TEST SCHEDULED 30 APRIL 69
    - PRESS. COMPARTMENT - ULT LOAD STATIC TEST COMPLETED
      10 OCT 68
  - **MISSION MODULE**
    - FWD SECTION DOOR SEPARATION - TEST SCHEDULED 11 JAN 69
  - **AERODYNAMIC - WIND TUNNEL**
    - 1/10 SCALE MODEL RIGID BODY FLUCTUATING PRESS TEST COMPLETED
    - PROTUBERANCE HEATING (4 BASIC MODELS) TEST COMPLETED
    - 1/2 SCALE METEOROID SHIELD - TRANSONIC (BUFFET) AND
      SUPersonic (FLUTTER) COMPLETED 11 DEC 68

- **MDAC-ED**
  - ADAPTER - ULT LOAD/MAX TEMP STATIC TEST COMPLETED SEPT 68
STRUCTURES STATUS (MAJOR MILESTONES)

O GE

• TRACKING MIRROR ASSEMBLY
  • LIMIT LOAD STATIC TEST OF STRUCTURE (3RD LOADS CYCLE)
    COMPLETED DECEMBER 68
  • ULTIMATE LOAD STATIC TEST (4TH LOADS CYCLE)
    SCHEDULED NOVEMBER 69
  • DYNAMIC TEST (4TH LOADS CYCLE) 2.4" BEARINGS COMPLETED DEC 68
  • THERMAL COVER
    STATIC TEST OF STRUCTURE (OUTSIDE SHELL) SCHEDULED JAN 69

O EK

• CAMERA OPTICAL ASSEMBLY
  • LIMIT LOAD STATIC TEST OF BARREL (-5, +2, +2)
    COMPLETED 3 NOVEMBER 68
  • MODAL SURVEY OF STRUCTURES DEV MODEL 1 (SDM-1)
    COMPLETED APRIL 68
  • SDM-1 ACOUSTIC TEST CONFIGURATION INSTRUMENTATION
    AND DATA ANALYSIS COMPLETED OCTOBER 68
  • ACOUSTIC TEST SCHEDULED SEPTEMBER 69
### Main Optical System Pointing Error

<table>
<thead>
<tr>
<th>Component</th>
<th>Spec</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave Hardware Including Structural Deflections</td>
<td>6</td>
<td>5.9</td>
</tr>
<tr>
<td>Target Location Uncertainty</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Ephemeris Uncertainty</td>
<td>14</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>RSS Total</strong></td>
<td>16</td>
<td>11.6</td>
</tr>
</tbody>
</table>
SMEAR RATE BUDGET
\( \mu \text{RAD/SEC} \ 2\sigma \)

AUTOMATIC

TRACKING MIRROR CONTROL SYSTEM

VIBRATION

IMAGE VELOCITY SENSOR (IVS)

RSS TOTAL

MANNED

CREW

RSS TOTAL

SECRET/DORIAN
SECRET / DORIAN

TRACKING MIRROR DRIVE SMEAR RATE

m RAD/SEC

<table>
<thead>
<tr>
<th>ALLOCATION (2g)</th>
<th>PREDICTED (2g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROLL</td>
<td></td>
</tr>
<tr>
<td>PITCH</td>
<td></td>
</tr>
<tr>
<td>2 AXIS TOTAL (LOS)</td>
<td></td>
</tr>
</tbody>
</table>

SPECIFICATION REQUIREMENT

SECRET / DORIAN
### TRACKING MIRROR SERVO ERROR

#### RAD/SEC

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>GIMBAL ALLOCATION ((2\sigma))</th>
<th>ACTUAL ((2\sigma))</th>
<th>PREDICTED ((2\sigma))</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITCH AXIS-18 RAD/SEC LOOP*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEARINGS</td>
<td>4.2</td>
<td>4.15</td>
<td>4.2</td>
</tr>
<tr>
<td>TORQUERS</td>
<td>2.5</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>POWER AMP &amp; COMP AMP</td>
<td>4.2</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>D/A AND BUFFER</td>
<td>4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMI</td>
<td>4.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>GYRO NOISE</td>
<td>2.5</td>
<td>1.95</td>
<td>2.70</td>
</tr>
<tr>
<td>ENCODER</td>
<td>0.3</td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>HARNESS</td>
<td>2.0</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>SAMPLING</td>
<td>0.5</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>COMMAND</td>
<td>1.0</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td><strong>TOTAL PITCH</strong></td>
<td>2(9.6) = 19.2</td>
<td></td>
<td>2(10.9) = 21.8</td>
</tr>
</tbody>
</table>

*BASED ON PITCH RATE OF 1.5 DEG/SEC
BASELINE DYNAMIC PERFORMANCE PREDICTION
(ON-AXIS, 80 N. M1.)

SPATIAL FREQUENCY (CYCLES/MM)
OPTICAL PERFORMANCE DIFFERENCES

MAJOR DIFFERENCES

- DIFFERENT CALCULATION TECHNIQUE - 7 SPECTRAL WAVE LENGTHS VERSUS MONOCHROMATIC

- CHANGE IN AERIAL IMAGE MODULATION (AIM) CURVE

- LARGER CENTRAL AND TOTAL OBSTRUCTION - 12.7% CENTRAL 17.2% TOTAL

- LOWER LIGHT TRANSMISSION (1/165 SEC VERSUS 1/200 SEC)

POTENTIAL IMPROVEMENT

- OPTICAL QUALITY FACTOR - CONTRACT TO GOAL
### ATS Performance (2σ)

<table>
<thead>
<tr>
<th></th>
<th>SPEC</th>
<th>PREDICTED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resolution</strong></td>
<td>3.3 ft</td>
<td>2.7 ft</td>
</tr>
<tr>
<td><strong>(2:1 contrast target, 80 n.mi., Schade eye data)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Jitter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(above 6 CPS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Mode</td>
<td>0.25 sec</td>
<td>0.21 sec</td>
</tr>
<tr>
<td>Backup Mode</td>
<td>1.25 sec</td>
<td>1.8 sec</td>
</tr>
<tr>
<td><strong>Pointing Accuracy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(assuming MDAC contributions of 6 min, no target location and ephemeris uncertainties)</td>
<td>10 min</td>
<td>7.8 min</td>
</tr>
<tr>
<td><strong>Slaved Mode</strong></td>
<td>100 μ rad/sec</td>
<td>81 μ rad/sec</td>
</tr>
<tr>
<td>(main optics smear when slaved to ATS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IMAGE VELOCITY SENSOR (IVS) PURPOSE

- IVS is mandatory for automatic mode to achieve
  resolution

- MOL on-board digital computer commands tracking mirror
  rates to within 1% of perfect tracking

- Image velocity sensor (IVS) reduces tracking mirror rates
  to within 0.08% of perfect tracking
BREADBOARD TESTS

MODULATION

GOODYEAR OPERATION

HYCON OPERATION

NO VENDOR OPERATED HERE

AVERAGE BRIGHTNESS

ENGINEERING MODEL TESTS

MODULATION

GOODYEAR OPERATION

AVERAGE BRIGHTNESS

NOTE: HYCON OPERATES OVER ENTIRE SPEC.

IVS BRIGHTNESS SPECIFICATION AND ACTUAL PERFORMANCE
PRELIMINARY IVS ENGINEERING MODEL (EPEM) TEST RESULTS

HYCON IVS

- SPECIFICATION COMPLIANCE SATISFACTORY EXCEPT FOR CROSSCOUPLING
- CROSSCOUPLING MAY VIOLATE SYSTEM REQUIREMENTS
  - TO BE ANALYZED
  - TO BE INVESTIGATED VIA CLOSED-LOOP TESTING

GOODYEAR IVS

- GOOD IMPROVEMENT FROM BREADBOARD TESTS OF PHASE I
- TESTING NOT COMPLETE ENOUGH TO DETERMINE SPECIFICATION COMPLIANCE

GOODYEAR AND HYCON UNITS WERE RETURNED TO VENDOR FACILITY FOR MODIFICATIONS DURING THIS TEST PROGRAM, CAUSING A TWO-WEEK DELAY
NEAR TERM SCHEDULE OF IVS EVENTS

- EVALUATION TESTS COMPLETE 31 JAN 69
- EVALUATION REPORT PRESENTATION 14 FEB 69
- RECOMMEND GOODYEAR OR HYCON AS WINNER 15 FEB 69
- START GOODYEAR OR HYCON CONTRACT 1 MAR 69
- DELIVERY TO GE OF GOODYEAR OR HYCON DEVELOPMENT IVS 1 NOV 69
SIMULATORS STATUS

- ELEMENTAL DEVELOPMENT SIMULATOR (EDS) AT GE
  - DEVELOPED LATE WITH POOR QUALITY SCENE VIEWING SYSTEM
  - CONTRIBUTED TO DEFINITION OF AVE CONTROLS AND DISPLAYS

- MISSION DEVELOPMENT SIMULATOR (MDS) AT GE
  - REQUIREMENTS DEFINED IN JUNE 1968; USES 9" X 9" SLIDES IN ITEK DEVELOPED SLIDE VIEWING SYSTEM
  - PHASE 0 CONFIGURATION (SINGLE CREW STATION) TO BE OPERATIONAL IN APRIL 1969
  - PHASE 3 CONFIGURATION (DUAL CREW STATIONS WITH AVE COMPUTER AND SOFTWARE) TO BE OPERATIONAL IN DECEMBER 1969

- MISSION SIMULATOR AT VAFB
  - CONSISTS OF LABORATORY MODULE SIMULATOR (LMSE), MISSION MODULE SIMULATOR (MMSE), AND GEMINI B PROCEDURES SIMULATOR (GBPS) WITH VOICE AND DATA CONNECTIONS TO MISSION CONTROL CENTER (MCC) AT SUNNYVALE
  - MMSE TO BE SIMILAR TO MDS; LMSE AND GBPS DESIGN AND DEVELOPMENTS PROCEEDING ESSENTIALLY ON SCHEDULE
  - SCHEDULED FOR 9 MONTHS OPERATIONS PRIOR TO FIRST MANNED LAUNCH
  - CURRENT PROBLEMS:
    - MMSE DEVELOPMENT DELAY DUE TO MDS DEVELOPMENT ACTIVITIES
    - LMSE/MMSE SOFTWARE INTERFACE UNDEFINED
    - LMSE/STC SOFTWARE (AND HARDWARE) INTERFACE UNDEFINED
    - GBPS/STC SOFTWARE INTERFACE UNDEFINED
MAJOR DIFFERENCES

MANNED

• GEMINI B
• 30 DAY MISSION
• 15,000 FRAMES
• 5 PSI ATMOSPHERE
• ONE-TIME DATA RETURN BY GEMINI B
• SHIP RECOVERY
• TARGET TRACKING AVAILABLE

COMMONALITIES

• HIGH RESOLUTION PHOTO RECONNAISSANCE
• ORBIT: 80 X 186 NMI
• INCLINATION: 90°
• GROUND EQUIPMENT AND FACILITIES COMPATIBLE WITH BOTH SYSTEMS
• ONE LAUNCH EVERY FOUR MONTHS
• FACTORY FACILITIES AND FIXED EQUIPMENT SUPPORT BOTH SYSTEMS
• LAUNCH WITH TIIM

UNMANNED

• SUPPORT MODULE
• APPROXIMATELY 60 DAY MISSION
• 500 FRAMES PER DAY
• 2 PSI ATMOSPHERE
• SIX TIME DATA RETURN BY DRV
• AIR RECOVERY
• SPACE PRESERVED FOR 29,500 FRAMES OF TB FILM

HANDLE VIA BYE MAN CONTROL SYSTEM ONLY
CURRENT STATUS

- **PHASE I TASKS COMPLETE:**
  - BASIC REQUIREMENTS DEFINED.
  - PART I CEI/EXCHANGE HARDWARE REQUIREMENTS DEFINED.
  - BASIC CONTRACTOR TO CONTRACTOR INTERFACES DEFINED.
  - TEST PROGRAM DEFINED.
  - TEST AND ASSEMBLY FLOW COMPLETE.
  - LIFE-LIMITED, CRITICAL COMPONENTS IDENTIFIED (VS. 60 DAY ORBIT LIFE).
GEMINI B TEST PROGRAM

- ELECTRONIC SYSTEMS TEST IN PROGRESS
  * SUBSYSTEM COMPATIBILITY
  * PYRO EMI SUSCEPTIBILITY
  * INSTRUMENTATION EVALUATION
  * INTERFACE (LV & T-III) EVALUATION

- CREW TRANSFER AND DRC HANDLING
  * ZERO G FLIGHTS - EV AND IV

- STRUCTURAL
  * ADAPTER HIGH TEMPERATURE CONDITION
  * EJECTION SEAT SYSTEM TESTS
  * COLD LAUNCH CONDITIONS

- ABORT SIMULATIONS
  * VERIFY CREW CONTROL CAPABILITY

- REENTRY HEATING
  * AFTERBODY SHINGLE TEMPERATURES DURING ABORT
  * HEAT SHIELD GAP QUALIFICATION

- DUAL GAS SYSTEM TEST
  * UNMANNED
  * MANNED
  * REENTRY CONTROL SYSTEM EVALUATION
MDAC-WD TEST STATUS

- BREADBOARD/ PROTOTYPE TESTING COMPLETE
  ACTS/ SCE, ACTS 22 LB THRUSTOR & PROPELLANT TANKS
  CREW RESTRAINTS, ANTENNA, MONITOR & ALARM, PCM,
  FM, & CENTRAL TIMING, MOI. SEIVE, WASTE COLLECTION,
  O₂ HEAT EXCHANGERS

- REMAINING SUBSYSTEM DEVELOPMENT TESTING IN PROCESS
  THRU NOV 1969

- SYSTEM DEVELOPMENT TESTING (EDCTU, DTS, ACTS/ CRYO)
  JUNE 1969 - SEPT 1971

- SUBSYSTEM QUALIFICATION TESTING JAN 1969 - DEC 1970

- SYSTEM QUALIFICATION TESTING (LMQTV) - SEPT 1971 - OCT 1971
GE IN-HOUSE TESTING ACTIVITIES

- COMPONENT AND BRASSBOARD DEVELOPMENT TESTS
  - GYROS, TRACKING MIRROR DRIVE BRASSBOARD, THERMAL
    DOOR DRIVE BRASSBOARD, BEARINGS, DRIVE ELECTRONICS,
    IMAGE VELOCITY SENSOR, MISSION DATA ADAPTER UNIT,
    EXPERIMENT CONTROLLER, CONSOLE CONTROLLER, AND
    TELEMETRY
  - DSS-1 (SUBSYSTEM DEVELOPMENT) SEPT 68 TO MAR 70
  - 113D (STRUCTURAL TEST VEHICLE) COMPLETE JULY 69
  - 113T (THERMAL TEST VEHICLE) COMPLETE OCT 69
  - 114 (DEVELOPMENT VEHICLE) NOV 69 TO JUN 70
  - 1970 AND LATER TESTS INCLUDE GE LAB MODULE CONSOLES (QUALIFICATION),
    114E (FOR EK), 115 (QUALIFICATION), 118 (FACI)
EK TEST STATUS

- PRELIMINARY STRUCTURAL VIBRATION MODAL SURVEY OF THE COA STRUCTURE HAS BEEN COMPLETED
- STATIC LOAD TEST OF THE OA STRUCTURE TO ORIGINAL LIMIT LOADS (5, 2, 2G) HAS BEEN COMPLETED
- ZERO-G/ONE-G (TURN-OVER) OA STRUCTURE DEFLECTION TEST IN PROGRESS
- COMPONENT DEVELOPMENT AND BREADBOARD TESTING IN PROGRESS
- HALF SCALE TRACKING MIRROR THERMAL DISTORTION TEST IN PROGRESS - RESULTS SHOULD BE AVAILABLE BY END OF JANUARY
- THERMAL MODEL (OA LEVEL) TESTING TO START THIS MONTH
- FORMULA SAMPLE TEST TO START IN MARCH
- ENGINEERING MODEL (OA LEVEL) TESTING TO START IN MARCH
- QUALIFICATION MODEL (OA LEVEL) TESTING TO START IN DECEMBER

HANDLE VIA BYEMAN CONTROL SYSTEM ONLY