FROM: 6595TH AEROSPACE TEST WG, VANDENBERG AFB, CALIF. VW2D
TO: SPACE SYSTEMS DIV, LOSA CALIF.

SUBJECT: EIGHT-HOUR FLASH REPORT VW2D 18-3-106

I. SUMMARY


<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. S. WALLER, LT. COL., USAF</td>
<td></td>
</tr>
</tbody>
</table>

PHONE 866-3771 PAGE 1 |
SECURITY CLASSIFICATION |

DD FORM 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED
ROLL CONTROL DURING THE S-01A THRUST INTERVAL
PREVENTED THE PROPER EXERCISE OF GUIDANCE AND APPARENTLY
CAUSED A PREMATURE SHUTDOWN OF THE ENGINE
PRECLUDING ORBITAL ATTAINMENT.

II. SIGNIFICANT EVENTS
PRELIMINARY VALUES OF SIGNIFICANT LAUNCH EVENTS ARE:

<table>
<thead>
<tr>
<th>Event</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFTOFF [13:00:00 PST]</td>
<td>ZERO</td>
</tr>
<tr>
<td>SOLID MOTOR TREMBLE DECAY (WEB BURN-OUT)</td>
<td>28 SEC</td>
</tr>
<tr>
<td>SOLID MOTOR S-01C THRUST (END OF THRUST TAILOFF)</td>
<td>40 SEC</td>
</tr>
<tr>
<td>SOLID MOTORS JETTISONED</td>
<td>71.5 SEC</td>
</tr>
<tr>
<td>SLY-2A STEERING INITIATED</td>
<td>92.44 SEC</td>
</tr>
<tr>
<td>MECO (S1) [START S-01A STANDARD TIMER]</td>
<td>150.75 SEC</td>
</tr>
<tr>
<td>VECO</td>
<td>159.72 SEC</td>
</tr>
<tr>
<td>SEPARATION COMMAND (S2)</td>
<td>164.28 SEC</td>
</tr>
<tr>
<td>SEPARATION COMPLETE (S-01A PNEUMATIC CONTROL ACTIVATED)</td>
<td>166.66 SEC</td>
</tr>
<tr>
<td>S-01A PNEUMATIC CONTROL LOSS</td>
<td>167.57 SEC</td>
</tr>
<tr>
<td>ULLAGE ROCKET IGNITION</td>
<td>168.68 SEC</td>
</tr>
<tr>
<td>S-01A ENGINE IGNITION</td>
<td>171.70 SEC</td>
</tr>
<tr>
<td>S-01A THRUST ATTAINMENT (90 PER CENT PC)</td>
<td>172.83 SEC</td>
</tr>
<tr>
<td>S-01A STEERING INITIATED</td>
<td>182.63 SEC</td>
</tr>
<tr>
<td>Event Description</td>
<td>Duration (Sec)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>5-01A STEERING STOPPED</td>
<td>209.88</td>
</tr>
<tr>
<td>5-01 ENABLE VELOCITY METER (S3)</td>
<td>337.89</td>
</tr>
<tr>
<td>5-01A BURN-OUT (50 PER CENT PC)</td>
<td>403.62</td>
</tr>
<tr>
<td>VTS VELOCITY RADAR FADE</td>
<td>410</td>
</tr>
<tr>
<td>VTS ACQUISITION BEACON FADE</td>
<td>469</td>
</tr>
<tr>
<td>S-01A LINK 1 TELEMETRY DATA LOSS (VTS)</td>
<td>459.5</td>
</tr>
<tr>
<td>S-01A LINK 2 TELEMETRY DATA LOSS (VTS)</td>
<td>459.5</td>
</tr>
</tbody>
</table>

### III. SLY-2A PERFORMANCE

All SLY-2A sub-systems performed adequately for achievement of the booster launch objectives. Solid motor performance was nominal with web burnout, tailoff, and jettison occurring essentially at predicted times. The telemetry channel monitoring of the electrical separation of the three solid motors indicated that solids 2 and 3 separated from the booster at 71.23 sec and that solid No. 1 lagged slightly, separating at 71.56 sec. MECO occurred approximately 2 sec later than predicted, but was commanded by ground guidance.

### IV. S-01A PERFORMANCE

The S-01A vehicle was not successful in achieving orbit. Pneumatic attitude control was lost shortly after launch.
AFTER SEPARATION AND THE ORBITAL STAGE ROLLED 
DURING THE THRUST INTERVAL, ENGINE IGNITION WAS 
NOMINAL BUT SHUTDOWN OCCURRED PREMATURELY, 
RESULTING IN A VELOCITY DEFIciENCY OF APPROXIMATELY 
820 FPS, AS INDICATED BY VELOCITY METER INTERROGATION. 
AFTER SHUTDOWN, PITCH AND YAW WERE CONTROLLED BY 
HYDRAULICS DURING THE THRUST INTERVAL, BUT GROUND 
GUIDANCE STEERING OF THE 8-W1A VEHICLE, WHICH WAS 
INITIATED 11 SEC. AFTER IGNITION, WAS DISCONTINUED 
AFTER 127 SEC. VEHICLE RESPONSE TO THE STEERING 
COMMANDS WAS ERRATIC, BECAUSE OF LOSS OF ROLL CONTROL, AND 
THE GROUND GUIDANCE SYSTEM IS DESIGNED TO TERMINATE 
STEERING AFTER ACCUMULATED STEERING ORDERS REACH 
A SPECIFIED LIMIT. 
UPON COMPLETION OF SEPARATION (166.66 SEC) THE PNEUMATIC 
CONTROL SYSTEM ACTIVATED AS EXPECTED, BUT CONTROL 
WAS EXERCISED FOR ONLY 0.9 SEC. DURING THIS INTERVAL 
THE UNREGULATED 24 VOLT MEASUREMENT SHOWED A 5.4 
VOLT DROP WHICH WAS INDICATIVE OF A TEMPORARY 
ELECTRICAL SHORT. OTHER MEASUREMENTS SUPPORT THE 
EXISTENCE OF A SHORT DURING THIS INTERVAL, HOWEVER. 
AT THIS TIME ITS LOCATION HAS NOT BEEN DETERMINED.
SUBSEQUENT TO THE LOSS OF PNEUMATIC CONTROL, THE ROLL AND PITCH GYROS INDICATED DIVERGING ATTITUDES. UPON ATTAINMENT OF HYDRAULIC PRESSURE DURING IGNITION PITCH AND YAW CONTROL WAS PROPERLY ASSUMED BY THE HYDRAULIC CONTROL SYSTEM, HOWEVER, THE VEHICLE ACCELERATED IN ROLL. THE HIGH ROLL RATE IS ASSUMED TO HAVE CAUSED THE PREMATURE ENGINE SHUTDOWN BY adversely AFFECTING PROPELLANT SUPPLY TO THE BUMPS. UPON ENGINE SHUTDOWN THE PITCH AND YAW ATTITUDES DIVERGED GIVING FURTHER EVIDENCE OF THE PERMANENT LOSS OF PNEUMATIC CONTROL.

THE COMMAND GUIDANCE SYSTEM INITIATED SLV-2A STEERING AT 92.44 SEC WITH MODERATE YAW LEFT AND PITCH DOWN ORDERS. SUBSEQUENT STEERING ORDERS BECAME LIGHT AND WERE TERMINATED AT 147.31 SEC. MECO RESULTED FROM GUIDANCE SYSTEM COMMAND AT 150.75 SEC, INDICATING THAT THE BOOSTER HAD ATTAIN THE VELOCITY REQUIRED BY THE GUIDANCE GOAL. SEPARATION WAS COMMANDED AT 164.25 SEC AND FOLLOWED BY INITIATION OF LIGHT 5-01A STEERING ORDERS AT 182.63 SEC. THE MAGNITUDE OF THE STEERING ORDERS GRADUALLY INCREASED DURING ASCENT WITH PREDOMINANTLY PITCH DOWN AND YAW LEFT ORDERS. THE FINAL YAW STEERING ORDER WAS AT 228.31 SEC. AND THE
PITCH STEERING TERMINATED AT 399.96 SEC. THE LAST COMMAND ENABLED THE 8-DIA VELOCITY METER AT 397.86 SEC.

V. SPACE-GROUND COMMUNICATIONS

VERLOST RADAR EXPERIENCED DIFFICULTY IN MAINTAINING CONTINUOUS TRACK OF THE VEHICLE DUE TO PROBLEMS IN THE RANGE TRACKING SYSTEM.

LOSS OF TRACK OCCURRED REPEATEDLY, AS JITTER IN THE 12 MICROSECOND RESET GATE CAUSED THE BEACON VIDEO RETURN TO JUMP THE TRACK GATE IN THE 2000 YARD STEPS.

VI. COUNTDOWN

THE COUNTDOWN WAS INITIATED ON SCHEDULE AT 02:29 PST ON 18 MARCH 1963 AND PROCEEDED TO LIFTOFF WITH ONE TECHNICAL HOLD IMPOSED FROM 12:15 TO 12:58 TO COMPLETE WORK WHICH HAD FALLEN BEHIND SCHEDULE.

THE FOLLOWING PROBLEMS AND DELAYS WERE ENCOUNTERED:

A. TASK 1 CLOSING WAS DELAYED ONE HOUR TO ALLOW DAC TO COMPLETE SOLID BOOSTER CHECKS SCHEDULED TO BE COMPLETED ON 1-1 DAY.

B. TASK 2 WAS DELAYED 30 MIN WHEN LTMSC ENCOUNTERED
DIFFICULTY IN INSTALLING THE PAYLOAD BLANKET.
A. PERSONNEL HIGH-LIFT MALFUNCTIONED WHILE
EXTENDED AND CAUSED AN ADDITIONAL DELAY OF 45
MIN WHILE THE HYDRAULIC SYSTEM WAS MANUALLY
BLEED TO DETECT RETRACTION. A TYPE 15 AIR
CONDENSING UNIT MALFUNCTIONED AND WAS REPLACED.
C.
D.
E.
IN TASK 6, DURING S-01A RF CHECKS, VERLOFT
EXPERIENCED DIFFICULTY IN INTEGRATING CODE 3, AND FOR
CODE 3 PULSE SHIFTER. THIS LATER CLEARED ITSELF.
DURING PAYLOAD CHECKS, THE VERLOFT BECAME
INACTIVE. PAYLOAD COMMANDS WERE SENT FROM THE
BLOCKHOUSE VIA HARDLINE WHILE A TRANSFORMER WAS
REPLACED IN THE VERLOFT POWER SUPPLY. THE
HARDLINE CHECKS WERE VERIFIED BY VERLOFT DURING
THE TERMINAL COUNT.
F. In Task 12, solid motor arming required 68
min longer than scheduled due to a new arming
procedure. IMSC countdown communications
channels were noisy. The channels were cleared
by replacing a blockhouse amplifier.
G. In Task 14, eighty-one lbs excess acid were
loaded aboard the S-01A due to an error in scale
setting. The excess was removed.

VII. AEROSPACE GROUND EQUIPMENT

The aerospace ground equipment functioned
satisfactorily to accomplish the booster and orbital
stage pre-launch checkout, with the following
exceptions:

A. A Type 15 air conditioning unit malfunctioned.
B. An amplifier in the IMSC countdown
communication system malfunctioned.
C. A personnel high lift malfunctioned. The
vehicle has been removed for repair.

VIII. PAD DAMAGE

Pad damage is not considered excessive and
normal turnaround schedule can be maintained.