

## BSE QUICK LOOK REPORT OF SATURN APOLLO 12 MISSION ACTIVITIES

### PRELAUNCH

All prelaunch commands were successful. Wind data was received from HOSC, evaluated, and passed on to the Guidance Officer. The Carnarvon command computer was lost with an estimate of several days before being fixed. This was deemed to be of minor concern. All flight control parameters were good at lift off and for the duration of the mission. A weather front was reported moving through the launch area just prior to liftoff but liftoff occurred on schedule. Time of Guidance Reference Release was 16:21:43.02 GMT.

### LAUNCH TO EARTH ORBIT PHASE

Launch phase through earth orbital insertion was nominal for the Launch Vehicle, although the Spacecraft had a severe power failure at approximately 35 to 45 seconds after liftoff. In that time frame, a momentary downrange (Z) accelerometer failure "A" was indicated and the Guidance Officer noted a small "glitch" in the Saturn inertial platform data. The CDR reported at approximately 5 minutes GET a small vibration in the S-II stage. The vibration was not evidenced in any real time data displayed in the control center. An orbit of 102.5 x 100 nautical miles achieved. The time base initiate times were as follows:

T1	0:00:00	GET	0:00:17	GRR
T2	0:02:15	GET		
T3	0:02:41	GET		
T4	0:09:12	GET		
T5	0:11:34	GET		

### EARTH ORBITAL PHASE

A slow S-IVB LOX tank pressure decay was noted. This continued through the coast phase and just prior to TB6 was 34.5 psia. Nominal tank pressure was predicted to be approximately 38-40 psia. This same occurrence was noted on Apollo 11, although the tank pressure only dropped to approximately 36 psia. Also, the fuel tank continuous vent regulator was holding the tank pressure at approximately 19.0 psia. The minimum is supposed to be 19.5 psia. Neither of these two anomalies was of concern for TLI. HOSC recommendation was received for a GO for first or second TLI opportunities. The Guidance Officer reported some errors in the IU state vector, apparently due to the "glitch" he noted at approximately 40 seconds after liftoff. These were estimated to be less than one half of the TLI NO GO limits.

## RESTART AND SECOND BURN PHASE

TB6 was initiated at 2:37:44 GET out of range of ground stations. When data was received at approximately three minutes into the second S-IVB burn, it was noted that the  $O_2/H_2$  burner LOX shutdown valve had failed open. Other than that, the second burn looked nominal. TB7 was initiated at 2:53:04 GET.

## TRANSLUNAR COAST

When the programmed functions were verified after cutoff, the BSE commanded the LOX shutdown valve closed. The burner commands were sent at 2:55:53 GET. All functions were nominal throughout spacecraft separation, docking, and extraction. The CDR noted that the S-IVB was venting in the area of the APS module II in the aft end. This was suspected by the BSE to be due to the  $O_2/H_2$  burner experiencing a hot shutdown due to the valve not closing. This could have burned a hole in the LOX regenerative coil or the helium coil. A small decay in the LOX tank ullage pressure was also noted, which would substantiate the suspicion. It was thought that this might cause a propulsive thrust to the launch vehicle towards the spacecraft. Therefore the BSE recommended to the Flight Director that the launch vehicle separation maneuver be commanded as soon as possible. This was echoed by the CDR seconds later and the <sup>evasive</sup> maneuver was commanded by the BSE at 4:18:17. TB8 was commanded at 4:26:39. All TB8 functions were nominal until just prior to the commanded APS ullage motor burn. An additional APS burn recommendation of 250 seconds was received from HOSC. The BSE was prepared to command the APS ullage motors on 250 seconds earlier than the programmed burn. However, at approximately 5:19:00 GET all TM was lost due to the rapid drop of signal strength from the omni antennas. BSE commanded in the blind to switch to the low gain antennas at 5:24:09. Data was received shortly thereafter, but the programmed APS burn was in progress. So the BSE commanded the APS ullage motors on at 5:29:11 and off at 5:33:41 for a 270 seconds burn. The recommendation from HOSC was changed from 250 to 270 seconds since the time of the commanded burn changed due to the data dropout. At approximately TB8 + 1:20 (GET 5:50), the CCS test was initiated and the antenna cycle was performed five times at approximately 20 minutes intervals. At approximately GET 6:20, the CCS AGC voltage was noted to be dropping. At GET 6:40, the Goldstone site was instructed to radiate at 20 KW. At approximately 7:10, the AGC went to zero. Continuous efforts were made by the site to reacquire two-way lock. At approximately GET 11:00, the AGC again came up, but when modulation was placed on the carrier, the AGC went to zero.

At approximately GET 12:38, the downlink was lost at all sites.

## OTHER ITEMS

1. The CDR recapped the S-II vibration. He indicated about a 1 to 2 cps non-longitudinal vibration all during the S-II burn.
2. The closest approach 3,091 nautical miles at 85:48:04 GET with a velocity of 4934.44 ft/sec and a latitude of  $17^{\circ}24'S$  and longitude of  $46^{\circ}23'E$ . (Slingshot)