

PFR-064 Title: SST digital HSK incorrect and shifting			
Assembly : FM1 IDPU		SubAssembly : DAP SN083	
Component :		Units Affected:	Units fixed:
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Failure Occurred During (Check one $$			
X Functional test \Box Qualification test \Box S/C Integration \Box Launch operations \Box Other (Flight Assy)			
Environment when failure occurred:			
Ambient	\Box Vibration	□ Shock	□ Acoustic
Thermal	Vacuum	X Thermal-Vacuum	□ EMI/EMC
Problem Description			

(In this section it is important to document the specific symptoms which exhibited the problem. In the event we see it happen again, we would like to know as much as possible.)

During FM1 Suite thermal vacuum, the SST digital housekeeping seen in the memory dump 7400 of the 404 APID was shifting locations or displaying wrong values.

Analyses Performed to Determine Cause

(How do we know how the failure happened? Was it a bad part, bad handling, what?) The SST digital status being read back by the DCB was found to shift over a word when the ETC chip was busily sending science data. It was determined that the ETC could not process the "memory read" command issued by the CPU in time for the CPU read of its register. Thus, the CPU was often reading the previous value instead.

Analysis showed that a worst case timing was 12 usec for the ETC to provide valid data to the CPU and thus the FSW requirement was changed to 125% or 15 usec. This was implemented by insertion of a few 8085 commands which simply take 15 usec.

Corrective Action/ Resolution

(How do we fix the unit? And how do we make sure it doesn't happen again?) The timing verification for the extended read back is implemented in two ways. First, the CPU cycles of the inserted commands are counted and divided by 2 MHz to determine that they are greater than 15 usec. Second, the system is run with the SST producing data and one can verify expected values from the SST are in the appropriate positions in the data stream (not shifted over).

This patch was inserted as Software Change Request #7 and included in Version 2.06 and higher.

Acceptance: MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____