PFR-40 Title: DAP variable conversion gain

Assembly : All DAP units	**SubAssembly:**
Component : C64, 164, 264, 364, 464, 564, 664, 764, 864, 964, 1064, 1164	**Date: April 25, 2005**
Originator: Ron Canario	**Organization: UCB/SSL**
Phone : 510-643-8646	**Email : ronc@ssl.berkeley.edu**

Failure Occurred During (Check one √)

√ Functional test □ Qualification test □ S/C Integration □ Launch operations

Environment when failure occurred:

√ Ambient □ Vibration □ Shock □ Acoustic
□ Thermal □ Vacuum □ 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.)

The conversion gains of the LTC1604AIG Analog-to-digital converters varied by less than +/-1% on the best performing units, but varied by as much as +/-4.5% on the worst performing units.

Analyses Performed to Determine Cause

(How do we know how the failure happened? Was it a bad part, bad handling, what?)

The gain variability was linearly related to the voltage of the 2.5 V reference voltage generated by the ADC. The reference voltage was excessively loaded by the current drawn by a 2.2 uF filter capacitor, which in the worst case was 330 nA, corresponding to the channel with the lowest gain conversion. The current was caused because the tantalum electrolytic capacitors were installed backwards; the polarity markings on the silkscreen on the printed circuit board were reversed. This was a design error.

Corrective Action/ Resolution

(How do we fix the unit? And how do we make sure it doesn't happen again?)

Replace the capacitors and install them with the correct polarity. Re-test the data acquisition section of the test procedure, section 8.0.

Acceptance:
MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____