



Edit A PR/PFR

Michael Amato, System Engineer for ACD

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PR Input Form

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To view project setup for this PR/PFR, select [Project Setup \(for revision #4\)](#).

★ Always Required ★ Required (via Data Field Information page)

Problem Information:		PR ID: ACD-02334-016	
★	Project: ACD		
	Spacecraft: ACD	★	Subsystem/Instrument: ACD
	Component: TDA		Assembly: Detector Tiles
★	Problem Description: (to add to description, use addendum box below) During two of the four transitions from hot to cold during the ACD thermal vacuum test, we observed high count rates in the ACDMonitor script. In each case, these rates exceeded 1000 Hz. The temperature range was approximately -10 C to -15 C. Because hardware counters were used, we only know that it was one of the data channels from phototubes attached to tile 320 - i.e. GARC 6, GAFE 16 or GARC 7, GAFE 17. By the time the temperature had stabilized at -25 C, the rates had returned to their normal values of less than 100 Hz. No problems have been seen with either phototube signal in any functional test at any temperature. Addendum 1 by Michael Amato on 08/24/2005 at 08:20: Additional review of the data showed that the high rate appeared at about +10 C, not -10 C. Addendum to Problem Description: <div style="border: 1px solid gray; height: 40px; width: 100%;"></div>		
★	Actual Problem Date: Jul-27-2005		Actual Problem Time: (use military time to record PM.) 14:00
Name of Person Entering: (if left blank, will default to user logged in) Dave Thompson			
★	WOA Number: 02334	★	Event / Operation Line Number: 110
	Configuration Type: <i>Other:</i>		Software Version:
	Item Number:		Item Revision:
	Serial Number:		
Attachment(s): Summary of Information about High Rates Seen During Cold Transitions			

SAVE and exit	Add Attachment(s)	RESET Form
Notify Other Users		

Disposition (needed for closing the PR). If disposition is changed and a signature is present, that signature will be removed.

Because we found no root cause for this problem, we cannot close this PR. The monitoring of data should be repeated during transitions when the LAT is in thermal vacuum testing.

(Make sure that you include the cause of the anomaly and the defect correction action taken in your disposition.)

To close the PR, 1 signature needed from the project AND 1 signature needed from QA.

Proj: SE	Close PR
To elevate to PFR, 1 signature needed from the project OR 1 signature needed from QA.	
Proj: SE	ELEVATE to PFR

Aug. 23, 2005

Summary of Information about High Rates Seen During Cold Transitions

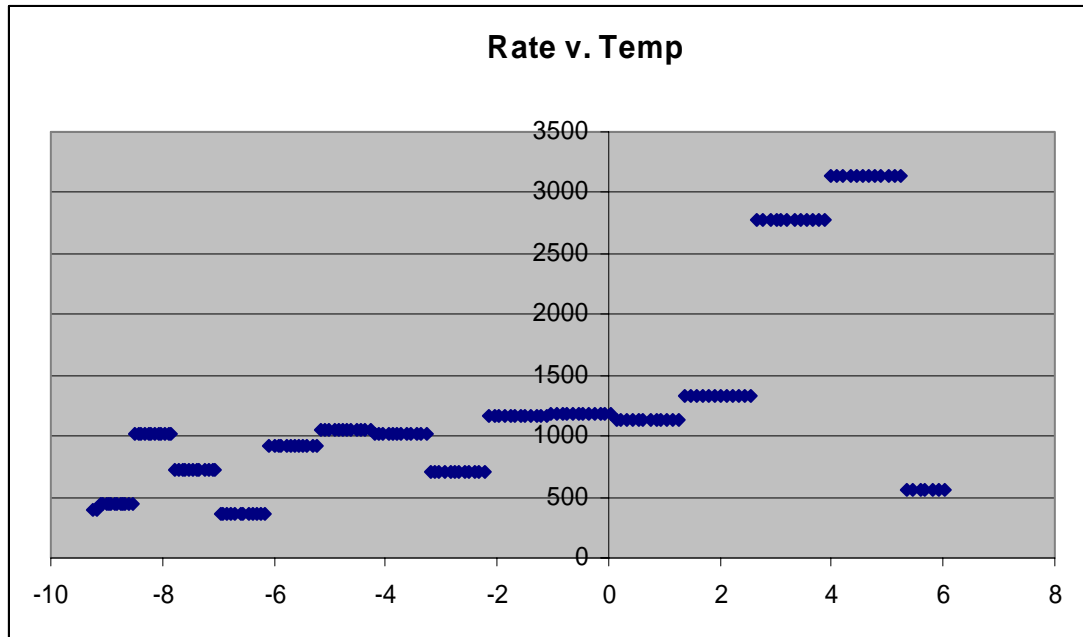


Fig. 1 – Rate in Hz vs. temperature during a transition from hot to cold.

Fig. 1 summarizes the most complete record we have of the problem. It shows the rate in Hz on this particular tile (Tile 320; with the two phototube rates summed) as a function of temperature, during a time when the temperature was decreasing. At the start of the data set, the rate was 562 Hz, jumping a few minutes later to 3142 Hz (because these are hardware counters that accumulate for 10 seconds per channel, an individual tile is read out only once every 8 minutes). As the temperature decreased, there was a general trend toward lower rates, although it was not smooth. The rate at the end of the run was 393 Hz.

The data file is

http://lhea-glast.gsfc.nasa.gov/acd/data/FUII-ACD-IT/THERMAL-VAC/072705-1631-Mon-Tran40--25-401000810/AcdMonitorRatesEnv_7.dat

Once the ACD reached cold soak, the rate stabilized, as shown in Fig. 2, which plots samples of the rate in Hz (Y axis) over a span of about two hours. This test uses a lower threshold than the one used during transition, so the rate below is higher than what would have been seen for the threshold in the plot above.

The data file is

<http://lhea-glast.gsfc.nasa.gov/acd/data/FUII-ACD-IT/THERMAL-VAC/072805-0351-TrigOp-minus25-TVAC-401000820/AcdTriggerOpHwRates7.dat>

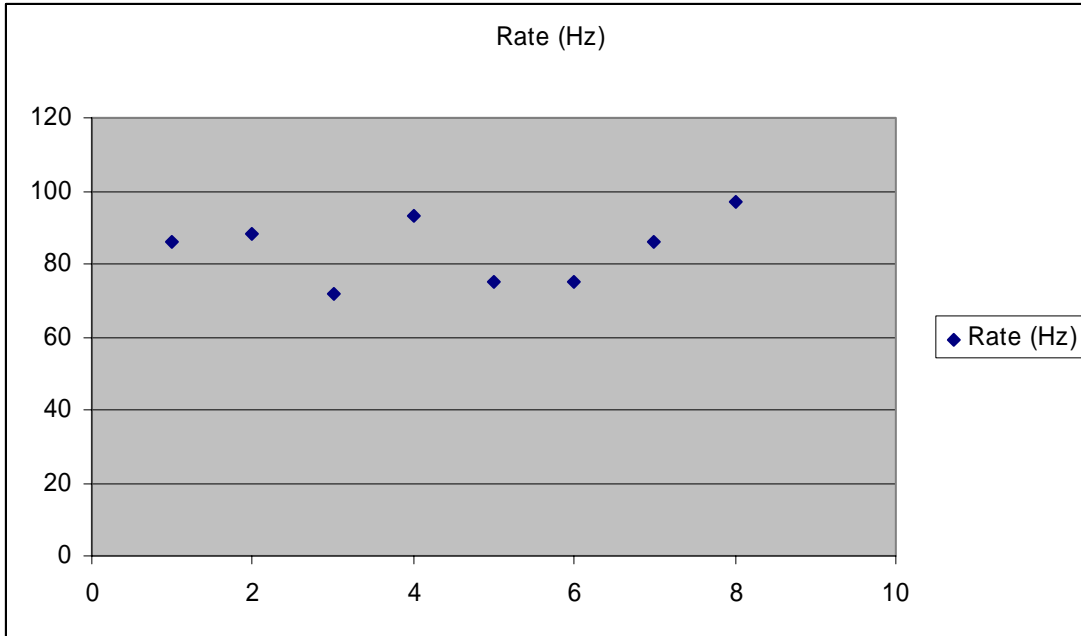
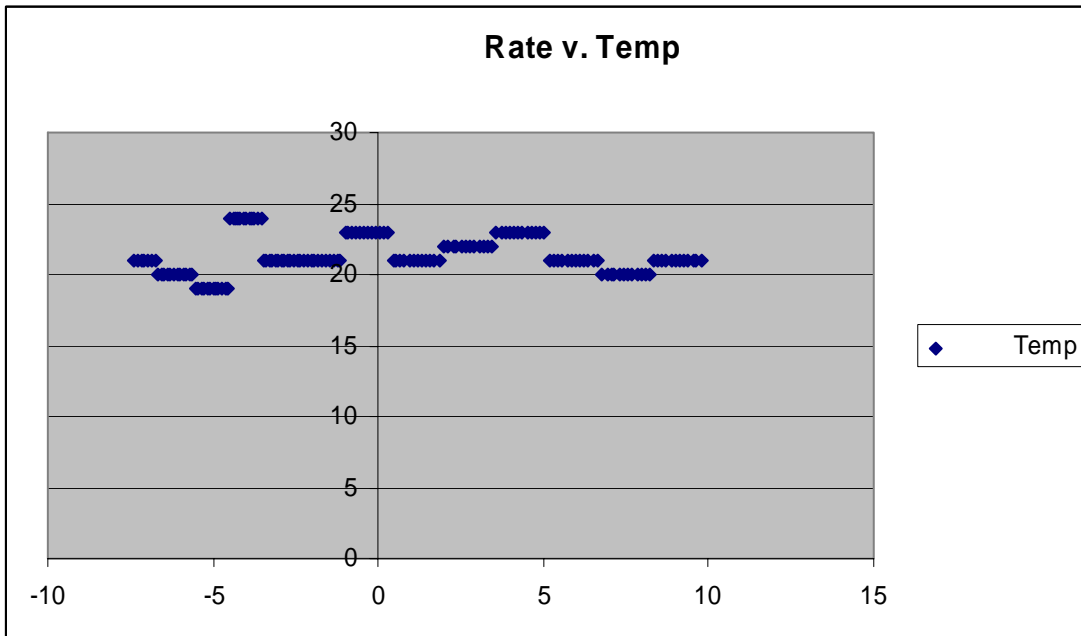


Fig. 2 – Rate on tile 320 during cold soak (lower threshold than used during transition)

In the next transition, from cold to hot, no excess was seen. Fig. 3 below uses the same threshold setting as Fig. 1.



The data set is

http://lhea-glast.gsfc.nasa.gov/acd/data/FUII-ACD-IT/THERMAL-VAC/073005-0706-Mon-minus25-plus23-tvac-401000846/AcdLightTightRatesEnv_7.dat

The pattern was repeated on another cycle.

The hot to cold transition data are:

http://lhea-glast.gsfc.nasa.gov/acd/data/FULL-ACD-IT/THERMAL-VAC/080205-1127-Mon+40--25-401000878/AcdLightTightRatesEnv_7.dat

Below a temperature of -10 C, but still during the transition to cold, the rate stabilized again. The data set is

http://lhea-glast.gsfc.nasa.gov/acd/data/FULL-ACD-IT/THERMAL-VAC/080205-1608-Mon+40--25-401000881/AcdLightTightRatesEnv_7.dat

The performance of both tubes on tile 320 was nominal during all functional and performance tests.