Rev.	ECO	Description	Author	Approved	Date
01	32-248	Use for SN2 Thermal-Vacuum testing	RFGoeke		9/27/07
02	32-249	Adjustments based upon use	RFGoeke		9/29/07
03	32-250	Add reset of cal rate at end	RFGoeke		10/1/07
04	32-260	Remove references to internal 28VDC monitor	RFGoeke		12/5/07

CRaTER
Short Form Functional
Test Procedure in Thermal/Vacuum

Dwg. No. 32-06003.0201

Revision 04
December 5, 2007

Serial No _____ Date: _____

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Preface

Revision 01 of the parent Rev. B is tuned for use during Thermal-Vacuum testing to account for a) the lack of PRT feedback into the instrument telemetry stream; and b) the presence of a ^{60}Co source permanently sitting on top of the telescope.

Revision 02 allowed for variations which occurred at -40C. The dosimeter output is drifting by a bit or so and it is collecting a few counts from the ^{60}Co source, the singles counts are not well behaved (decided to ignore those altogether), and the noise statistics are getting worse.

Revision 03 reset the cal rate to 8Hz at the end of the procedure.

1 Introduction

Same as parent document.

2 Requirements

Same as parent document.

3 Configuration

Same as parent document.

4 Procedures

Space is provided for the recording of information of particular significance in the conduct of this test. Where a value simply needs to be verified, as opposed to recorded – or an instruction to send a command acknowledge -- a simple check mark √ will suffice. In addition the Test Conductor may redline the procedure to more accurately document the actual flow of events, both routine and anomalous.

The pages of this section will be attached to the Test Report that is filed each time this activity is conducted. The telemetry data stream generated by the spacecraft simulator is also an integral part of the Test Report; that data is archived on crater.bu.edu.

4.1 Identification of Test Environment

Procedure requiring this test: _____

_____

Location of Test Environment _____

Date: _____

4.2 Identification of Equipment and Personnel

Flight Instrument, 32-10000 S/N _____

Spacecraft Simulator, 32-80201 S/N _____

Test Conductor _____

QA Representative: _____

Other Individuals: _____

_____

_____

_____

4.3 Configure the EGSE

We assume that "sf_log" and "sf_noise" as well as CHouse and CCmd are running on the test console. If not, refer to the parent Short Form Functional for instructions.

4.4 Verify Initial Instrument State

Turn on DC power supply and verify proper instrument initialization as follows – **or, if the instrument is already powered issue the following command:**

Command	Function	Value	Sent?
	Reset	n/a	

Verify that the time displayed in either the "CRaTER Analog House" and "CRaTER Command" widows is consistent with wall time and is incrementing every second.

Time and Date displayed	Initial

Verify that the time string displayed is not preceded by "/One Hertz/", which would indicate a failure of the instrument to receive the 1 Hz tick from the spacecraft simulator on J1.

Check absence of /One Hertz/ display	Initial

Record the serial number of the unit under test, as displayed at CRaTER Command window.

Instrument Serial Number	Initial

Read, record, and verify the state of the instrument command tell-tales (the current state is highlighted in the display.

From command.tcl				
Group	Command	Value	Expected	OK?
HV Bias	On/Off		Off	
Calibrate	Low		Off	
	High		Off	
	Rate		8 Hz	
Processing	D1		On	
	D2		On	
	D3		On	
	D4		On	
	D5		On	
	D6		On	

Read, record, and verify the nominal housekeeping values recorded by the instrument. Note that the PRT is read out with an ohmmeter.

From house.tcl					
Group	**Measurement**	**Value**	**Units**	**Expected**	**OK?**
Bus Voltages	+5 Digital		volts	5.0±0.1	
	+5 Analog			5.0±0.1	
	-5 Analog			-5.0±0.1	
Bias Current	D1		μamps	<0.1	
	D3				
	D5				
	D2			<0.40 at 25C	
	D4				
	D6				
Bias Voltage	Thin		volts	2.5±1	
	Thick			2.5±1	
Thresholds	Cal Amplitude		volts	<0.01	
	Thin LLD			0.048±0.001	
	Thick LLD			0.048±0.001	
Temperatures	Telescope		C	Ambient	
	Analog Board			Ambient	
	Digital Board			Ambient	
	DC-DC Supply			Ambient	
	Bulkhead			Ambient	
Dosimeter	Low		mRad	<0.1	
	Medium		mRad	<0.1	
	High		Rad	<0.1	
Ground Test	PRT Temp.		C	Ambient	

From GSE Power Supply			
Measurement	**Value**	**Expected**	**OK?**
Voltage		27-35	
Current		0.15-0.25 amps	

Time Completed	Initial

4.5 Turn Detector Bias On

Command	Function	Value	Sent?
	Detector Bias	ON	

Read, record, and verify the following. Note that, with the detector bias on, we are detecting the $_{60}$Co source which is why the particle counts are not zero in channels D2, D4, and D6.

From command.tcl					
Group	**Command**	**Value**	**Units**	**Expected**	**OK?**
HV Bias	On/Off		na	On	
	Voltage Thin		volts	75±10	
	Voltage Thick			220±10	
	Current D1		μamps	<0.01 at -40C <0.1 at 25C <0.4 at 40C	
	Current D3				
	Current D5				
	Current D2			<0.1 at -40C <2.0 at 25C <8.0 at 40C	
	Current D4				
	Current D6				
System	Echo		na	3 : 0x1000	
Particle Counts	Good		na	<4	
	Reject			0	
	Total			<4	

From GSE Power Supply			
Measurement	**Value**	**Expected**	**OK?**
Voltage		27-35	
Current		0.15-0.25 amps	

4.6 *Initiate the Internal Calibration Signal*

Command	Function	Value	Sent?
	Cal Amplitude	128	

Read, record, and verify the following

From command.tcl				
Group	**Command**	**Value**	**Expected**	**OK?**
Calibrate	Amplitude		2.048±0.024	

Command	Function	Value	Sent?
	Cal Low	ON	

Read, record, and verify the following.

From command.tcl				
Group	**Item**	**Min. Value**	**Expected**	**OK?**
Particle Counts	Good		8	
	Reject		0	
	Total		8	

4.7 *Check Detector Noise Levels*

Command	Function	Value	Sent?
	Cal Rate	2KHz	

read, record, and verify the following using the program **`sf_noise`**

From Statistics window					
Detector	**Mean**	**Expected**	**Sigma**	**Expected**	**OK?**
D1		216±16		<5	
D2					
D3					
D4					
D5					
D6					

Command	Function	Value	Sent?
	Cal Rate	8Hz	

Time Completed	Initial