

Tracker Test Parameters/ Functions

7 July 05, v1

No.	Test Case	Test Case Description	Parameter(s) Measured/Calculated	Function(s) Validated	Notes
1	TE100	Tracker Turn On & Power Consumption	a) TEM Measured Voltage b) TEM Current Consumption Step Change	a) Tracker Housekeeping Telemetry	
2	TE201	GTRC Configuration Register Load & Readback		a) GTRC Communications	
3	TE202	GTRC Configuration Register Load & Readback		a) GTFE register communications b) Left/Right Command & Readout	
4	TE203	Data readout test		a) Left/Right Data Readout	
5	TE301	Gain and Noise Measurement	a) Average Channel Gain b) RMS Channel Gain c) Average Channel Noise d) RMS Channel Noise e) Number of Dead Channels f) Number of Disconnected Channels	a) Charge Injection b) Calibration masks c) Data masks d) Trigger threshold set e) Charge injection level set	For an LPT, 4 channels per GTFE are tested.
6	TE302	Single Strip Noise Occupancy	a) Single Strip Noise Occupancy	a) Trigger threshold set	
7	TE303	GTFE Noise Occupancy Scan	a) GTFE Noise Occupancy as a function of Threshold DAC value b) Average SSD Noise c) GTFE Threshold DAC lower limit	a) Data masks b) Trigger threshold set	
8	TE304	GTFE Trigger Threshold Scan	a) GTFE Threshold DAC lower limit b) GTFE Trigger rate as a function of Threshold DAC value	a) Data masks b) Trigger threshold set c) Three-in-a-row Trigger d) Low Rate Science counters	

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9	TE305	Layer Trigger Threshold Scan	a) Layer Threshold DAC lower limit b) Layer Trigger rate as a function of Threshold DAC value c) Trigger primitive rate	a) Data masks b) Trigger threshold set c) Three-in-a-row Trigger d) Low Rate Science counters	
10	TE306	Time Over Threshold	a) Time Over Threshold Gain	a) Calibration masks b) Data masks c) TOT circuit functionality d) Charge Injection level set e) Charge Injection	TOT is measured from both GTRCs.
11	TE307	Trigger Request (TREQ) Check	a) Trigger primitive rate	a) Calibration masks b) Data masks c) TREQ System functionality d) Low Rate Science counters e) Trigger threshold set	
12	TE401	Self-Triggering Test	a) Trigger primitive rate	a) Calibration masks b) Data masks c) Three-in-a-row Trigger d) Trigger threshold set e) TEM diagnostics	Where is the SSD Hit Map function validated?
13	TE403	Efficiency, Resolution, and Alignment	a) Layer Detection efficiencies b) Layer-OR Trigger efficiencies c) Threshold DAC Upper Limit d) Tray alignment	a) Layer-OR b) Data masks c) Three-in-a-row Trigger function d) Trigger threshold set	
14	TE601	Threshold Calibration	a) Optimum GTFE Trigger Threshold	a) Charge Injection b) Calibration masks c) Data masks d) Trigger threshold set e) Charge injection level set	

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15	TE602	TOT Conversion Parameter Calibration	a) Channel TOT Conversion Parameters	a) Calibration masks b) Data masks d) TOT circuit functionality e) Charge Injection level set f) Charge Injection	
16	TE603	MIP Calibration	a) GTFE Charge Injection Scale		Data collected during SVAC Muon runs.
17	TE604	Threshold Dispersion	a) Channel Trigger Threshold Dispersion (Trigger threshold as a function of injected charge)	a) Charge Injection b) Calibration masks c) Data masks d) Trigger threshold set e) Charge injection level set	
18	TE702	Trigger Jitter Measurement	a) Channel Trigger Jitter	a) Charge Injection b) Calibration masks c) Data masks d) Trigger threshold set e) Charge injection level set	
19	TE703	Deadtime Measurement	a) Tracker Deadtime	a) External trigger	
20	TE704	Noise Occupancy with Readout in Progress	a) Noise Occupancy during readout	a) Data masks b) Threshold level set	