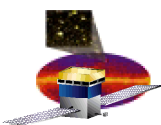


GLAST Large Area Telescope: TKR Hand-off review for Tower 7 and 9

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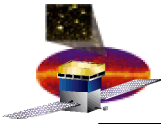


Power Consumption

- Values for MCM measurements account for the increase due to PS voltage itself, not current increase due to voltage increase.

Tower 7	Pisa	SLAC	MCM
Tower total	10.0 W	9.9 W	9.1 W
Tower + TEM/TPS	17.9 W	19.6 W	N/A
Leak current @100V	68 μ A	73 μ A	N/A

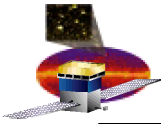
Tower 9	Pisa	SLAC	MCM
Tower total	10.0 W	10.4 W	9.4 W
Tower + TEM/TPS	18.5 W	20.2 W	N/A
Leak current @100V	67 μ A	90 μ A	N/A



Band Channels (Tower 7)

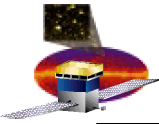
No major change observed except for layers indicated by orange background where # of hot strips increased by two or more strips. It is because SLAC hot strips list is OR of hot strips found at all tests, not in one test.

Layer	Tray	Side	MCM#	Pre ship (Pisa)				Handoff (SLAC)					Layer
				disconnect	dead	noisy	total	disconnect	dead	noisy	others (offline)	total	
Y17	TOP 007	Back	2403	0	4	4	8	0	4	6	0	10	Y17
X17	MID 095	Front	260	0	1	0	1	1	1	3	0	4	X17
X16		Back	263	1	0	0	1	1	0	0	0	1	X16
Y16	MID 042	Front	2278	0	1	2	3	0	1	0	0	1	Y16
Y15		Back	2429	0	5	5	10	0	4	4	0	8	Y15
X15	MID 102	Front	2177	0	0	0	0	0	0	0	0	0	X15
X14		Back	11282	0	0	0	0	0	0	1	0	1	X14
Y14	MID 005	Front	11276	0	0	0	0	0	0	0	0	0	Y14
Y13		Back	2079	1	0	0	1	1	0	1	0	2	Y13
X13	MID 009	Front	2173	2	0	0	2	2	0	0	0	2	X13
X12		Back	2441	1	1	1	3	1	1	1	0	3	X12
Y12	MID 103	Front	2260	0	0	0	0	0	0	0	0	0	Y12
Y11		Back	2353	0	0	0	0	0	0	0	0	0	Y11
X11	MID 045	Front	2036	0	0	0	0	0	0	0	0	0	X11
X10		Back	2179	4	0	0	4	4	0	0	0	4	X10
Y10	MID 073	Front	2204	0	0	0	0	0	0	0	0	0	Y10
Y9		Back	2381	2	0	0	2	2	0	0	0	2	Y9
X9	MID 093	Front	2131	0	0	0	0	0	0	0	1	1	X9
X8		Back	2323	0	0	0	0	0	0	0	0	0	X8
Y8	MID 123	Front	2550	0	2	2	4	0	2	3	0	4	Y8
Y7		Back	2553	0	1	0	1	0	1	0	0	1	Y7
X7	MID 074	Front	2157	0	0	0	0	0	0	0	0	0	X7
X6		Back	2332	0	1	0	1	0	0	1	0	1	X6
Y6	HVY 025	Front	2347	0	1	0	1	0	0	0	0	0	Y6
Y5		Back	3056	0	5	4	9	0	4	4	0	7	Y5
X5	HVY 022	Front	11467	0	12	4	16	0	12	4	0	16	X5
X4		Back	3006	0	6	1	7	0	6	1	0	7	X4
Y4	HVY 004	Front	2051	0	0	0	0	0	0	0	0	0	Y4
Y3		Back	3053	1	1	0	2	1	1	0	0	2	Y3
X3	HVY 024	Front	2265	0	0	0	0	0	0	0	0	0	X3
X2		Back	3068	0	1	1	2	0	1	1	0	2	X2
Y2	LGT 001	Front	422	0	6	10	16	0	8	14	0	16	Y2
Y1		Back	2312	0	4	2	6	0	4	5	0	9	Y1
X1	LGT 009	Front	2407	0	0	0	0	0	0	2	0	2	X1
X0		Back	2414	0	1	0	1	0	1	0	0	1	X0
Y0	BTM 010	Front	2008	0	0	0	0	0	0	2	2	Y0	
Total				12	53	36	101	13	51	51	3	109	
Fraction				0.02%	0.10%	0.07%	0.18%	0.02%	0.09%	0.09%	0.01%	0.20%	



Bad channels (Tower 9)

Layer	Tray	Side	MCM#	Pre ship (Pisa)				Handoff (SLAC)					Layer
				disconnect	dead	noisy	total	disconnect	dead	noisy	others (offline)	total	
Y17	TOP 013	Back	2708	1	0	1	2	1	0	1	1	2	Y17
X17	MID 194	Front	2673	0	0	0	0	0	0	0	0	0	X17
X16		Back	2728	0	0	0	0	0	0	0	0	0	X16
Y16	MID 152	Front	2134	1	0	0	1	1	1	3	0	4	Y16
Y15		Back	2067	0	0	0	0	0	0	0	0	0	Y15
X15	MID 125	Front	905	0	0	1	1	0	0	1	0	1	X15
X14		Back	977	0	0	0	0	0	0	0	0	0	X14
Y14	MID 160	Front	2233	0	0	0	0	0	0	0	0	0	Y14
Y13		Back	2365	0	0	0	0	0	0	0	0	0	Y13
X13	MID 142	Front	2638	0	1	0	1	0	1	0	0	1	X13
X12		Back	2591	0	0	0	0	0	0	0	0	0	X12
Y12	MID 138	Front	2636	0	0	0	0	0	0	0	0	0	Y12
Y11		Back	2583	0	0	0	0	0	0	0	0	0	Y11
X11	MID 157	Front	2178	0	0	1	1	0	0	2	0	2	X11
X10		Back	2196	2	1	1	4	2	1	1	0	4	X10
Y10	MID 158	Front	2246	0	1	0	1	0	1	0	1	2	Y10
Y9		Back	2262	0	2	3	5	1	2	5	0	7	Y9
X9	MID 147	Front	2737	0	2	1	3	0	2	1	0	3	X9
X8		Back	11003	1	2	2	5	1	2	2	0	5	X8
Y8	MID 124	Front	11019	4	0	0	4	4	0	0	0	4	Y8
Y7		Back	11213	8	0	1	9	8	0	1	0	9	Y7
X7	MID 127	Front	2622	0	0	1	1	0	1	5	0	5	X7
X6		Back	2691	0	0	0	0	0	0	0	0	0	X6
Y6	HVY 053	Front	2678	0	0	0	0	0	0	0	0	0	Y6
Y5		Back	3119	0	0	1	1	0	1	3	0	3	Y5
X5	HVY 059	Front	2047	0	0	0	0	0	0	1	0	1	X5
X4		Back	3121	6	2	0	8	6	2	0	0	8	X4
Y4	HVY 060	Front	2565	0	0	1	1	0	1	3	0	3	Y4
Y3		Back	3096	0	0	0	0	0	0	0	0	0	Y3
X3	HVY 061	Front	2570	0	0	2	2	0	0	0	0	0	X3
X2		Back	3098	0	0	0	0	0	0	0	1	1	X2
Y2	LGT 093	Front	2577	0	0	0	0	1	0	1	0	2	Y2
Y1		Back	2596	0	0	0	0	0	0	0	0	0	Y1
X1	LGT 040	Front	2643	0	0	0	0	0	0	0	0	0	X1
X0		Back	2607	0	1	2	3	0	1	4	0	5	X0
Y0	BTM 009	Front	2272	0	0	0	0	0	0	0	1	1	Y0
Total				23	12	18	53	25	16	34	4	73	
Fraction				0.04%	0.02%	0.03%	0.10%	0.05%	0.03%	0.06%	0.01%	0.13%	



Hit Efficiency

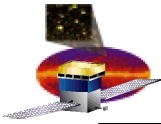
Tower 7

	pre-ship	error	hand-off	error	delta/error
Y0	99.5	0.07	99.5	0.06	-0.5
X0	99.6	0.06	99.6	0.05	-0.2
X1	99.8	0.04	99.8	0.04	-0.4
Y1	99.6	0.06	99.7	0.04	1.3
Y2	99.4	0.07	99.2	0.06	-2.0
X2	99.8	0.04	99.7	0.04	-0.8
X3	99.6	0.06	99.6	0.05	0.0
Y3	99.7	0.05	99.5	0.05	-2.0
Y4	99.7	0.05	99.7	0.04	-0.5
X4	99.3	0.08	99.3	0.06	-0.1
X5	99.3	0.08	99.2	0.07	-1.3
Y5	99.3	0.08	99.3	0.06	0.0
Y6	99.8	0.04	99.8	0.04	-0.4
X6	99.8	0.04	99.7	0.04	-0.7
X7	99.9	0.03	99.8	0.04	-1.2
Y7	99.9	0.03	99.8	0.04	-1.3
Y8	99.8	0.04	99.7	0.04	-0.7
X8	99.8	0.04	99.8	0.03	0.3
X9	99.8	0.04	99.9	0.03	0.8
Y9	99.9	0.03	99.8	0.03	-1.1
Y10	99.9	0.03	99.9	0.02	-0.1
X10	99.8	0.04	99.8	0.03	-0.1
X11	99.9	0.03	99.9	0.03	-0.5
Y11	99.9	0.03	99.9	0.02	-0.1
Y12	99.9	0.03	99.9	0.03	-0.3
X12	99.8	0.04	99.8	0.03	-0.2
X13	99.9	0.03	99.8	0.03	-0.9
Y13	99.9	0.03	99.8	0.03	-1.4
Y14	99.9	0.03	99.8	0.03	-0.6
X14	99.9	0.03	99.8	0.03	-1.3
X15	100	0.00	99.9	0.02	-1.1
Y15	99.7	0.05	99.6	0.04	-1.1
Y16	99.9	0.03	99.9	0.02	0.0
X16	99.9	0.03	99.9	0.03	-0.5
X17	99.6	0.06	99.5	0.05	-0.9
Y17	99.3	0.08	99.2	0.07	-1.4
average	99.70	0.01	99.68	0.01	-1.7

Tower 9

	pre-ship	error	hand-off	error	delta/error
Y0	99.4	0.07	99.4	0.06	-0.4
X0	99.5	0.06	99.3	0.06	-1.8
X1	99.8	0.04	99.8	0.03	0.3
Y1	99.9	0.03	99.8	0.03	-0.9
Y2	99.8	0.04	99.8	0.03	0.0
X2	99.8	0.04	99.8	0.03	0.1
X3	99.6	0.05	99.6	0.04	0.0
Y3	99.6	0.05	99.5	0.05	-1.3
Y4	99.5	0.06	99.5	0.05	0.2
X4	99.3	0.07	99.3	0.06	0.1
X5	99.7	0.05	99.7	0.04	0.2
Y5	99.5	0.06	99.6	0.05	0.7
Y6	99.8	0.04	99.8	0.03	-0.3
X6	99.8	0.04	99.7	0.04	-1.0
X7	99.6	0.05	99.5	0.05	-1.1
Y7	99.6	0.05	99.3	0.06	-2.7
Y8	99.8	0.04	99.8	0.03	0.0
X8	99.8	0.04	99.7	0.04	-1.4
X9	99.6	0.05	99.8	0.03	1.5
Y9	99.7	0.05	99.6	0.05	-1.5
Y10	99.9	0.03	99.8	0.03	-0.6
X10	99.8	0.04	99.7	0.03	-0.7
X11	99.9	0.03	99.9	0.02	0.0
Y11	99.9	0.03	99.9	0.02	-0.2
Y12	99.9	0.03	99.8	0.03	-0.9
X12	99.9	0.03	99.9	0.03	-0.5
X13	99.8	0.04	99.8	0.03	0.3
Y13	99.9	0.02	99.9	0.02	-0.2
Y14	99.9	0.02	99.8	0.03	-1.1
X14	99.9	0.02	99.8	0.03	-0.9
X15	99.9	0.02	99.9	0.02	-0.2
Y15	99.9	0.02	99.9	0.02	0.2
Y16	99.8	0.03	99.8	0.03	0.1
X16	99.9	0.02	99.8	0.03	-0.6
X17	99.6	0.05	99.5	0.05	-0.8
Y17	99.5	0.06	99.5	0.05	-0.4
average	99.70	0.01	99.70	0.01	0.0

No major change observed.



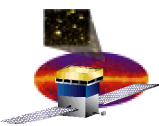
Trigger Efficiency

Tower 7

trigger combination	handoff
C0-1-2	97.5
C1-2-3	97.5
C2-3-4	96.9
C3-4-5	96.5
C4-5-6	96.8
C5-6-7	97.4
C6-7-8	98.5
C7-8-9	98.7
C8-9-10	98.7
C9-10-11	98.9
C10-11-12	98.9
C11-12-13	98.9
C12-13-14	98.7
C13-14-15	98.6
C14-15-16	98.7
C15-16-17	97.9

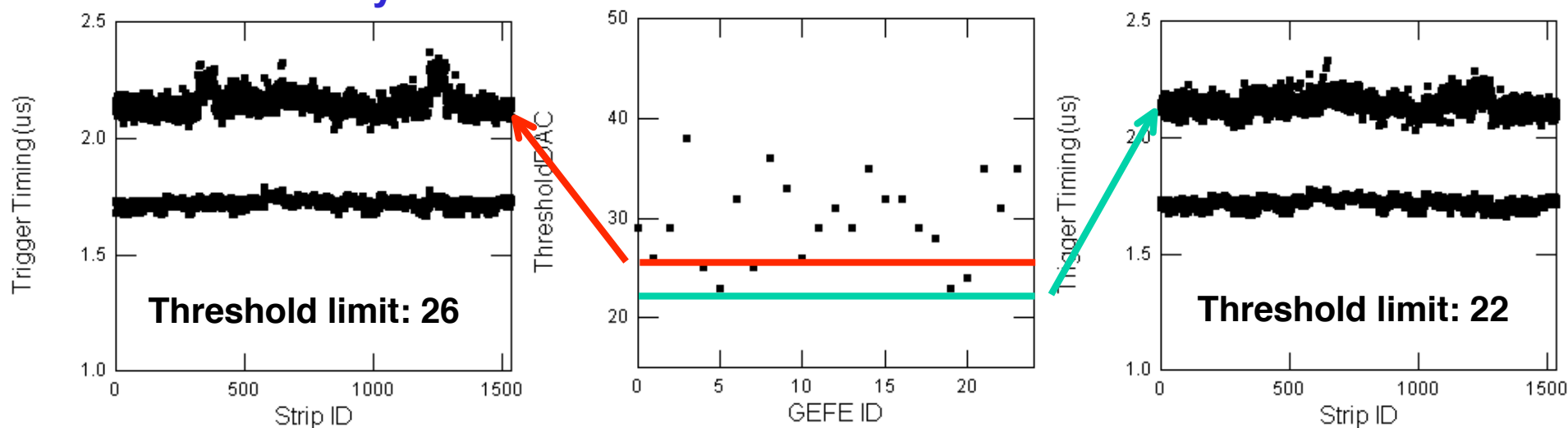
Tower 9

trigger combination	handoff
C0-1-2	97.9
C1-2-3	98.3
C2-3-4	97.4
C3-4-5	97.2
C4-5-6	97.6
C5-6-7	97.6
C6-7-8	97.8
C7-8-9	97.6
C8-9-10	98.2
C9-10-11	98.6
C10-11-12	98.9
C11-12-13	99.2
C12-13-14	99.0
C13-14-15	99.1
C14-15-16	99.1
C15-16-17	98.4

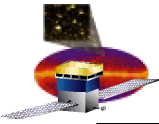


Notes and Anomalies

- Both tower 7 and 9 passed TE701 (Trigger Jitter test).
 - New specification.
 - Threshold limit is lowered to 22 from 26.
 - If threshold is higher than optimum, trigger timing for 1/2 MIP is delayed.

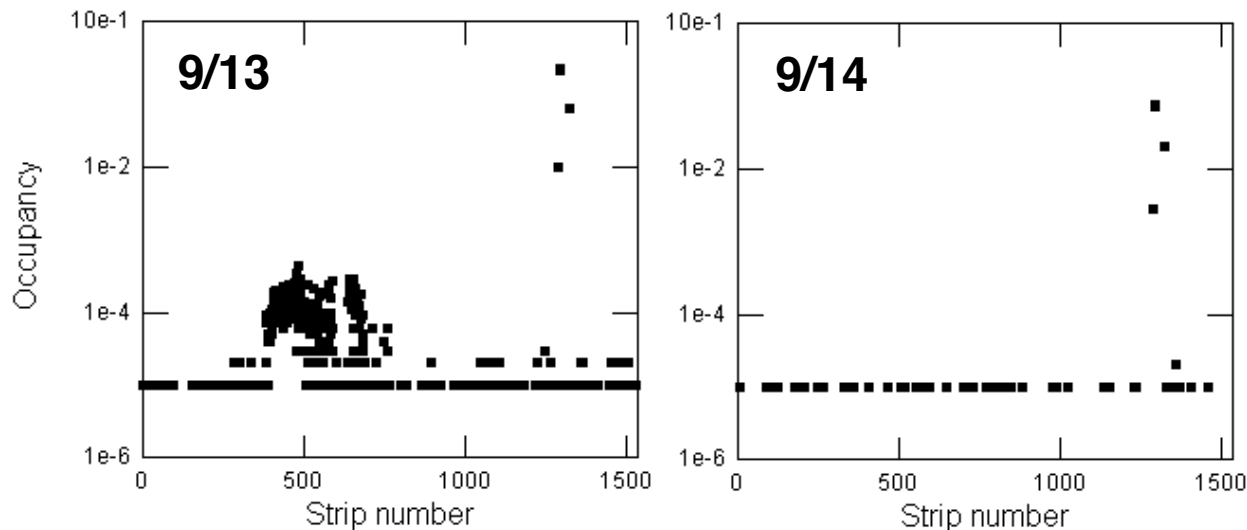


- Tower 7 failed DVD margin test @ 2.56V or lower. (NCR00662)
 - X6-LO GTRC failed on data readout test due to bit error.
 - Out of specification. (Specification is 2.65 ± 0.15 V)
 - Nothing we can do other than mating flight TEM with high DVDD.
- Tower 7 failed noise occupancy test. (NCR00661, next page for details)
 - Lasted about a few hours (Not a permanent problem).



NCR00661

- Tower 7 layer X5 failed noise occupancy test occasionally.
 - Occurrences for a few hours on only first day of the hand-off test.
 - Whole layer seems noisier than normal.
 - Occupancies are not alarmingly high. ($\sim 10^{-4} \approx$ around threshold.)
 - It is not likely due to SSD degradation.
 - Leakage current in cable 6-7 pair is normal.
 - Hot strips are in chip#6-10. (smaller than ladder boundary)
 - When quiet, these chips are quite normal. (see threshold scan plot)
 - No further test possible since we do not observe this any longer.
 - Possible link to INFN NCR 577.



9/16 Threshold scan

