# Appendix A

## Accelerometer Sensitivities and Charge Amp Settings

GLAST LAT Project TEM/TPS Vibration Testing

### Accelerometer Sensitivities and Charge Amp Settings

<table>
<thead>
<tr>
<th>Accel. #</th>
<th>Ch. #</th>
<th>S/N</th>
<th>Model</th>
<th>Sensitivity [pC/g]</th>
<th>F.S. Range [g]</th>
<th>Tape Gain [mV]</th>
<th>Sensitivity [mV/g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>D21</td>
<td>6</td>
<td>1496582</td>
<td>2226C</td>
<td>3.5 x 10^3</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A21</td>
<td>8</td>
<td>1181451</td>
<td>2226C</td>
<td>3.6 x 10^3</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A22</td>
<td>9</td>
<td>1181451</td>
<td>2226C</td>
<td>3.6 x 10^3</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A23</td>
<td>10</td>
<td>861797</td>
<td>2226C</td>
<td>3.0 x 10^3</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A24</td>
<td>11</td>
<td>166206</td>
<td>2226C</td>
<td>3.0 x 10^3</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A25</td>
<td>12</td>
<td>350716</td>
<td>2226C</td>
<td>1.947</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A26</td>
<td>13</td>
<td>350716</td>
<td>2226C</td>
<td>1.947</td>
<td>200</td>
<td>300</td>
<td>1000</td>
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<tr>
<td>C21</td>
<td>14</td>
<td>1337-48</td>
<td>2226C</td>
<td>15.0</td>
<td>200</td>
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<tr>
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<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A22</td>
<td>16</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A23</td>
<td>17</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
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<tr>
<td>A24</td>
<td>18</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
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<tr>
<td>A25</td>
<td>19</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A26</td>
<td>20</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>C21</td>
<td>21</td>
<td>1337-48</td>
<td>2226C</td>
<td>15.0</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A21</td>
<td>22</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A22</td>
<td>23</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A23</td>
<td>24</td>
<td>867-193</td>
<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>A24</td>
<td>25</td>
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<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
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<tr>
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<td>2226C</td>
<td>1.747</td>
<td>200</td>
<td>300</td>
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</tbody>
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Form: 09009-A
## Appendix B – Test Log

### Table: GLAST LAT Project TEM/TPS Vibration Testing

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Unit</th>
<th>Axis</th>
<th>Bin or Random</th>
<th>Level [g/6gms]</th>
<th>Frequency [Hz]</th>
<th>File Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/18/05</td>
<td>17:07</td>
<td>904</td>
<td>X</td>
<td>Random</td>
<td>0.035</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/18/05</td>
<td>17:13</td>
<td>904</td>
<td>X</td>
<td>Random</td>
<td>0.035</td>
<td>131</td>
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<td>17:30</td>
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<td>X</td>
<td>Random</td>
<td>0.035</td>
<td>131</td>
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<td>17:37</td>
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<td>X</td>
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<td>0.035</td>
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<td>18:05</td>
<td>904</td>
<td>X</td>
<td>Random</td>
<td>0.035</td>
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<td>X</td>
<td>Random</td>
<td>0.035</td>
<td>131</td>
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<td>X</td>
<td>Random</td>
<td>0.035</td>
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<td></td>
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<tr>
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<td>18:46</td>
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<td>X</td>
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<td>0.035</td>
<td>131</td>
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</tbody>
</table>

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## Appendix B – Test Log

### GLAST LAT Project TEM/TPS Vibration Testing

#### Test Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Unit #</th>
<th>Axis</th>
<th>Sin or Random</th>
<th>Level [gal/grams]</th>
<th>Frequency [Hz]</th>
<th>File Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>X</td>
<td>Sin</td>
<td>115</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Y</td>
<td>Random</td>
<td>6.25</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Z</td>
<td>Sin</td>
<td>15</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>1</td>
<td>20</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>2</td>
<td>50</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>3</td>
<td>100</td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>4</td>
<td>200</td>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>5</td>
<td>500</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>6</td>
<td>1000</td>
<td>10000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>7</td>
<td>2000</td>
<td>20000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>8</td>
<td>5000</td>
<td>50000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>9</td>
<td>10000</td>
<td>100000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15/20</td>
<td>12:00</td>
<td>A3</td>
<td>Sin</td>
<td>10</td>
<td>20000</td>
<td>200000</td>
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</tr>
</tbody>
</table>

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## Appendix C – Procedure Variation

### GLAST LAT Project TEMTPS Vibration Testing

<table>
<thead>
<tr>
<th>Date</th>
<th>Axis</th>
<th>Test Setup</th>
<th>Installation Step Description</th>
<th>RE/DA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td>Incoming Visual inspection (e.g. ensure taped gaps are still sealed)</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Z</td>
<td></td>
<td>Torque vibration fixture bolts to shaker to 25 ft-lb (330 in-lb)</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Z</td>
<td></td>
<td>Torque TEMTPS to vibration fixture to 157 in-lbf</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Z</td>
<td></td>
<td>Confirm accelerometer installation</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>X</td>
<td></td>
<td>Torque vibration fixture bolts to shaker to 25 ft-lbf</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>X</td>
<td></td>
<td>Torque TEMTPS to vibration fixture to 157 in-lbf</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>X</td>
<td></td>
<td>Confirm accelerometer installation</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Y</td>
<td></td>
<td>Torque vibration fixture bolts to shaker to 25 ft-lbf</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Y</td>
<td></td>
<td>Torque TEMTPS to vibration fixture to 157 in-lbf</td>
<td></td>
</tr>
<tr>
<td>97/05</td>
<td>Y</td>
<td></td>
<td>Confirm accelerometer installation</td>
<td></td>
</tr>
</tbody>
</table>

---

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### GLAST LAT Project TEM/TPS Vibration Testing

**Qualification/Acceptance Test Data Package Checklist**
(Items supplied by Wyle Labs at end of test)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description / Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calibrated Equipment List</td>
</tr>
<tr>
<td>2</td>
<td>Vibration Test plots (Pre- and Post test signature overlays and random vibration test data for Z, X, and Y axes)</td>
</tr>
<tr>
<td>3</td>
<td>Electronic Data in UFF or equivalent format, if available</td>
</tr>
<tr>
<td>4</td>
<td>Photographs of test setup (example provided with manual)</td>
</tr>
<tr>
<td>5</td>
<td>Procedure data sheets (Appendices A, B, and C)</td>
</tr>
<tr>
<td>6</td>
<td>Visual Inspection Report</td>
</tr>
<tr>
<td>7</td>
<td>Test Control System Software Setup Sheets</td>
</tr>
</tbody>
</table>

---

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CX1 X-Axis Control

Sine
Standard Linear Accelerator
J/N 49995.01972
TPS / TPS

Channel: 1
Channel type: CX Filtered
Sweep type: logarithmic
Sweeps done: 1
Sweeps req.: 1
Sweep DIR Set: up
Sweep rate: 2.66 Gc/min
Unit: g
Contr. strat.: Closed loop

-- Testing time --
Elapsed: 00:00:04:18
Remaining: 00:00:00:00
Date: 00-11-00
Time: 11:02:00

X-axis
Acceptance Unit
Fixture only
CXI X-Axis Control

Random

Stramford Linear Accelerator

40K 9995.51972

TEM + EPS

[g'/Hz]

Channel: 1
Channel Type: C
DOF: 126
Level: 0.6 dB
Resolution: 4 Hz
Contrast: 3 g
Unit: g'/Hz

RMS [act.] = 6.845 g
RMS [ref.] = 4.757 g
Contrast: Closed Loop

-- Time on act. level --
elapsed: 06:00:00
remaining: 00:00:00

-- Time total --
elapsed: 06:00:54
remaining: 00:00:00

Date: 05/31/05
Time: 11:12:53

X - Axis
Acceptance Unit
Fixture Only
CZ1 Z-Axis Control

Sine
Stanford Linear Accelerator
J/N 49995.51472
120 / TFS

Channel: 1
Channel Type: C4 Filtered
Sweep Type: Logarithmic
Sweep Down: 1
Sweep Required: 1
Sweep Direct: Up
Sweep Rate: 2.0 Oct/min
Unit: g
Controller: Closed Loop

-- Testing time --
Elapsed: 0:00:00:10
Remaining: 0:00:00:10

Date: 05-11-85
Time: 19:24:30

Z - axis
Acceptance Unit
Plotted Only
AX3 TPS top center

Sine
Stanford Linear Accelerator
J/N 49995.51972
TEM / TPS

Channel no.: 2
Channel type: X Filtered
Sweep type: logarthmic
Sweeps done: 1
Sweeps req.: 1
Sweep direct.: up
Sweep rate: 2.00 Oct/min
Unit: g
Contr. strat.: Closed loop

-- Testing time --
elapsed: 000:04:18
remaining: 000:00:00

Date: 05-11-95
Time: 14:53:29

X-axis: Post Random
Acceptance Unit
CLAY 1913

Max: 385.7 Hz 2.274 g

C:\\Wrel\Data\\Wep\SLAC\SLAC_49.g 5-2030 Acceptance X_013.txt
AX3 TPS top center

Stanford Linear Accelerator
J/N 49998.57972

PRELIMINARY DATA

Channel no.: 2
Channel type: M Filtered
Sweep type: Logarithmic
Sweep range: 1
Sweep rate: 2.00 Cycles/minute
Unit: Hz
Control strat.: Closed loop

Tested time:
Elapsed: 00:04:18
Remaining: 00:00:00

Date: 05-11-05
Time: 16:07:25

X-axis: Beam Radius 2nd Run
Acceptance Unit
GLAT: 1813
AX3 TPS top center

Stanford Linear Accelerator

PRELIMINARY DATA

Chan. no: 2
Chan. type: N Filtered
Sweep type: Logarithmic
Sweep done: 1
Sweep req.: 1
Sweep direct. map
Sweep rate: 2.00 Oct./min
Unit: g
Contr. strat.: Closed loop

-- Testing time --
elapsed: 000:04:18
remaining: 000:00:00
Date: 05-11-95
Time: 15:16:34

X-axis Post Random 3rd Run
Acceptance Unit
GEAT 10:13
Sine
Stanford Linear Accelerator
J/N 49995.51672
TEM / TPE

AXl TEM center edge

PRELIMINARY DATA

Channel: S
Channel Type: M Filtered
Sweep Type: Logarithmic
Sweep Done: 1
Sweep Req.: 1
Sweep Direct.: Up
Sweep Rate: 2.00 Oct/min
Unit: g
Contrats.: Closed Loop

Testing time:
eNorth 0001:04:18
remaining: 0000:00:00
Date: 05-11-95
Time: 15:14:34

X - axis: Post Random 3rd Run
Acceptance Unit: CLAY 1.113

C:\\Y omnip\data\\5\SLAC\SLAC.15 g 5-2008 Acceptance X_015.rsn
Sine
Stanford Linear Accelerator
J/N 49995.61972
VER 1.73

CY1 Y-Axis Control

Chan. no: 1
Chan. type: CN Filtered
Sweep type: logarithmic
Sweeps done: 1
Sweeps req.: 1
Sweep direction: up
Sweep rate: 2.00 cm/min
Unit: g
Contr. strat.: Closed loop

-- Testing time --
elapsed: 05:04:19
remaining: 00:09:00
Date: 05/11/02
Time: 15:56:16

Y-axis: Pre Random Acceptance Unit

C:\NPS\Data\mp\SLAC\SLAC.15.g 5-2000 Acceptance Y_009.run
AZ4 TPS Boss 2

Sine

Stanford Linear Accelerator

A/N 4993551972

TEM / TPS

Preliminary Data

Channel: 2
Channel Type: M Filtered
Sweep Type: Logarithmic
Sweeps Done: 1
Sweeps Req.: 1
Sweep Direction: Up
Sweep Rate: 2.00 Oct/min
Unit: g

Test/Strat.: Closed Loop

-- Testing time --
Elapsed: 00:04:10
Remaining: 60:00:00

Date: 05-12-06
Time: 14:28:40

Z-axis: Pre Random
Acceptance Unit: SLAC 16/13

Max: 351.2 Hz  2.852 g
CZ1 Z-Axis Control

Sine

Stanford Linear Accelerator
J/N 49995.51972
TEM / TPS

--- Testing data ---
- Test mode: g
- Sweep type: Logarithmic
- Sweep speed: 2.00 Oct/min
- Sweep rate: 2.00 Oct/min
- Unit: g
- Control stat.: Closed Loop
- Testing time:
elapsed: 00:03:18
remaining: 00:00:00
- Date: 05-12-05
- Time: 14:51:27
- Acceptance Unit: Random

Plot of Z-axis response over a frequency range of 5 to 2000 Hz.
Sine
Stanford Linear Accelerator
C/N 49995.51572
TEM / TPS

AX4 TPS Boss 2

Channel: 2
Channel type: M Filtered
Sweep type: Logarithmic
Sweep range: 1
Sweep rate: 1
Sweep direction: up
Sweep rate: 2.00 Oct/min
Unit: g
Contrast level: Closed loop

-- Testing time --
Elapsed: 00:01:04
Remaining: 00:00:10

Date: 05-12-05
Time: 14:51:27
Z-axis Peak Random Acceptance Unit
GLM 1013
AZ1 TPS Edge Center

Channel: 6
Channel Type: M Filtered
Sweep Type: logarithmic
Sweep Rate: 2.00 Uper/min
Unit: g
Contr. Strat.: Closed loop

-- Testing time --
Elapsed: 00:00:04:10
Remaining: 00:00:00:00

Date: 06-12-06
Time: 14:55:27

Z-axis Root Random
Acceptance Unit: "0.13"