Integrated Advanced Microwave Sounding Unit-A (AMSU-A) Performance Verification Report
Final Comprehensive Performance Test Report
P/N 1331720-2-TST, S/N 105/A1

Contract No. NAS 5-32314
CDRL 208

Submitted to:
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Submitted by:
Aerojet
1100 West Hollyvale Street
Azusa, California 91702
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Azusa, California 91702
### Grounding System Test (Paragraph 3.2.4.1)

#### J1 of Spacecraft Interface

<table>
<thead>
<tr>
<th>From Chassis Ground to</th>
<th>Pin Description</th>
<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
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<tbody>
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<td>J1-1</td>
<td>+28 V MLB</td>
<td>&gt; 100k</td>
<td>&gt; 100k</td>
<td>P</td>
</tr>
<tr>
<td>J1-2</td>
<td>+28 V MLB</td>
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<td>J1-3</td>
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## Grounding System Test (Paragraph 3.2.4.1)

### J4 of Spacecraft Interface

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## TEST DATA SHEET 1 (Sheet 4 of 9)
### Grounding System Test (Paragraph 3.2.4.1)

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<th>From Chassis Ground to</th>
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<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
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### Test Data Sheet 1 (Sheet 6 of 9)

Grounding Interface Test (Paragraph 3.2.4.1)

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## TEST DATA SHEET 1 (Sheet 7 of 9)

**Grounding Interface Test (Paragraph 3.2.4.1)**

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<td>&gt; 100k</td>
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<tr>
<td>J2-3</td>
<td>J4-12</td>
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<tr>
<td>J4-12</td>
<td>J4-13</td>
<td>+10 V INTERFACE BUS</td>
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# Test Data Sheet 1 (Sheet 8 of 9)

Grounding Interface Test (Paragraph 3.2.4.1)

<table>
<thead>
<tr>
<th>Source Pin</th>
<th>Destination Pin</th>
<th>Source Pin Description</th>
<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
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<tbody>
<tr>
<td>J2-2</td>
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<td>DATA CLOCK (C1)</td>
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<tr>
<td>J2-5</td>
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<tr>
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<td>8 SEC SYNC PULSE</td>
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<td>J3-1</td>
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<td>J4-9</td>
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<td>J4-13</td>
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<td>J4-13</td>
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<td>COLD CAL POS LSB (IN)</td>
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<td>J4-13</td>
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<td>J5-6</td>
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<td>COLD CAL POS LSB (OUT)</td>
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<tr>
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<td>J4-13</td>
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<td>J4-13</td>
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### TEST DATA SHEET 1 (Sheet 9 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

<table>
<thead>
<tr>
<th>Source Pin</th>
<th>Destination Pin</th>
<th>Source Pin Description</th>
<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
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<tbody>
<tr>
<td>J6-2</td>
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<td>RF SHELF A1-1 TEMP</td>
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<td>J6-3</td>
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<tr>
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<td>J4-13</td>
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<td>J4-13</td>
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<td>J6-14</td>
<td>J4-13</td>
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<td>J6-15</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH7 MON</td>
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<td>+15 VDC PLL LO MON</td>
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<td>J4-13</td>
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<td>J6-18</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH15 MON</td>
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<td>-15 VDC ANT DRIVE MON</td>
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<td>J6-29</td>
<td>J4-13</td>
<td>-15 VDC SIG PROC MON</td>
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<td>J6-31</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH6 MON</td>
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<td>J6-32</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH8 MON</td>
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<tr>
<td>J6-33</td>
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<td>J4-13</td>
<td>IF AMP MON</td>
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</tbody>
</table>

Circle Test:  

METSAT/AMSU-A1 System P/N IS-1331720  
Shop Order: 373234  
S/N: 105  
Date: 3/16/99  
Test Systems Engineer: 

Customer Representative (Flight Hardware Only)  
Date:  
Quality Control:  
Date: 3-16-99  

A-10
TEST DATA SHEET 2
+28 MLB During Turn-on Transient (Paragraph 3.2.4.2.1.1)

At 28.56 Vdc:

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>S/N 101-104</th>
<th>S/N 105 &amp; up</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>237.2 ms</td>
<td>20 ms max</td>
<td>300 ms max</td>
<td>P</td>
</tr>
<tr>
<td>8</td>
<td>Peak Current</td>
<td>4.61 Amps</td>
<td>10.6 Amps</td>
<td>5.9 Amps</td>
<td>P</td>
</tr>
<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>76/17 mA/µs</td>
<td>677 mA/µs</td>
<td>250 mA/µs</td>
<td>P</td>
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</table>

At 27.44 Vdc:

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<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>S/N 101-104</th>
<th>S/N 105 &amp; up</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>242.7 ms</td>
<td>20 ms max</td>
<td>300 ms max</td>
<td>P</td>
</tr>
<tr>
<td>8</td>
<td>Peak Current</td>
<td>4.156 Amps</td>
<td>10.6 Amps</td>
<td>5.9 Amps</td>
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<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>6.4/7 mA/µs</td>
<td>677 mA/µs</td>
<td>250 mA/µs</td>
<td>P</td>
</tr>
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</table>

At 28.00 Vdc:

<table>
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<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>S/N 101-104</th>
<th>S/N 105 &amp; up</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>235.6 ms</td>
<td>20 ms max</td>
<td>300 ms max</td>
<td>P</td>
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<tr>
<td>8</td>
<td>Peak Current</td>
<td>4.495 Amps</td>
<td>10.6 Amps</td>
<td>5.9 Amps</td>
<td>P</td>
</tr>
<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>6.0/16 mA/µs</td>
<td>677 mA/µs</td>
<td>250 mA/µs</td>
<td>P</td>
</tr>
</tbody>
</table>

* Refer to Figure 5.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 105 3-16-99
Test Systems Engineer Date
Customer Representative (Flight Hardware Only) Date
Quality Control Date

A-11
X = 246.4 ms  \[ \Delta X = 237.2 \text{ ms} \]  
Y = 46.5333 m  \[ \Delta Y = 46.11 \text{ mV} \]

**CAP TIM BUF**

**Peak Current** = \[ \frac{100 \text{ mA}}{10 \text{ mV}} \times 46.11 \text{ mV} = 4611 \text{ mA} \]  
= 4.61 A

**Pulse Width** = 237.2 ms

---

**S/N**: 3732 34  
**SN**: 105  
**Test Eng.**:  
**Date**: 5-26-99  
**Quality**:  
**TDS-2**
$X = 10.22\,\text{ms}$ \quad $\Delta X = 15.62\,\mu\text{s}$ \quad $Y = 5.17576\,\text{m}$ \quad $\Delta Y = 11.93\,\text{mV}$

$Y_a = 5.12867\,\text{m}$ \quad $\Delta Y_a = 11.9\,\text{mV}$

CAP TIM BUF
70.0
10.0
/Div

Real
V
1.0A/10mV

$\Delta I = \frac{100\,\text{mA}}{10\,\text{mV}} \times 11.93\,\mu\text{s} = 119.3\,\text{mA}$

$\Delta t = 15.62\,\mu\text{sec}$

$\frac{\Delta I}{\Delta t} = 76.37\,\text{mA}/\mu\text{sec}$

$\begin{array}{c}
\text{MLA TURN-ON } \frac{\Delta I}{\Delta t} \\
\text{Test Eng.: \(\bigcirc\)} \\
\text{Date: 3-16-98}
\end{array}$

$\begin{array}{c}
\text{SN: 105} \\
\text{TDS-2}
\end{array}$

$\text{(Qualit}: \(\bigcirc\) 3.00+$}
Peak Current = \(1.0A/10\text{mV} \times 44.56\text{mV} = 4456\text{mA}\)

\[\text{Pulse Width} = 242.7\text{msec}\]
Peak Current = \( \frac{100 \text{ mA}}{10 \text{ cm}} \times 4.95 \text{ cm} = 4.95 \text{ mA} \)

Pulse Width = 253.6 msec
TEST DATA SHEET 3
+28 MLB Operating Power (Paragraph 3.2.4.2.1.2)

<table>
<thead>
<tr>
<th>Step</th>
<th>+28 V MLB at 27 Volts</th>
<th>Measured</th>
<th>Units</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+28 V MLB voltage at 27 V (V_b) (Measured)</td>
<td>27.01</td>
<td>Volts</td>
<td>27.0 ± 0.1</td>
<td>P</td>
</tr>
<tr>
<td>3</td>
<td>Average Current (I_V) (PLO #1)</td>
<td>2.34 A</td>
<td>Watts</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>+28 V MLB bus power = I_V \times V_b (PLO #1)</td>
<td>63.2 W</td>
<td>Watts</td>
<td>82 W max</td>
<td>P</td>
</tr>
</tbody>
</table>

+28 V MLB at 28 Volts

<table>
<thead>
<tr>
<th>Step</th>
<th>+28 V MLB Bus Voltage at 28 V (V_b) (Measured)</th>
<th>Measured</th>
<th>Units</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>+28 V MLB voltage at 28 V (V_b) (Measured)</td>
<td>28.01</td>
<td>Volts</td>
<td>28.0 ± 0.1</td>
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<td>Average Current (I_V) (PLO #1)</td>
<td>2.26 A</td>
<td>Watts</td>
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<td>N/A</td>
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<td>711</td>
<td>+28 V MLB Operating Power = I_V \times V_b (PLO #1)</td>
<td>63.3 W</td>
<td>Watts</td>
<td>82 W max</td>
<td>P</td>
</tr>
</tbody>
</table>

+28 V MLB at 29 Volts

<table>
<thead>
<tr>
<th>Step</th>
<th>+28 V MLB voltage at 29 V (V_b) (Measured)</th>
<th>Measured</th>
<th>Units</th>
<th>Required</th>
<th>Pass/Fail</th>
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<tr>
<td>816</td>
<td>+28 V MLB voltage at 29 V (V_b) (Measured)</td>
<td>29.01</td>
<td>Volts</td>
<td>29.0 ± 0.1</td>
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<td>917</td>
<td>Average Current (I_V) (PLO #1)</td>
<td>2.45 A</td>
<td>Watts</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>1018</td>
<td>+28 V MLB operating power = I_V \times V_b (PLO #1)</td>
<td>63.2 W</td>
<td>Watts</td>
<td>82 W max</td>
<td>P</td>
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</tbody>
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|   | AVERAGE CURRENT (I_V) (PLO #2) | 2.34 A | Amps | N/A | N/A |
| 7   | +28 V MLB bus power = I_V \times V_b (PLO #2) | 63.2 W | Watts | 82 W max | P |

|   | AVERAGE CURRENT (I_V) (PLO #2) | 2.28 A | Amps | N/A | N/A |
| 13  | +28V MLB bus power = I_V \times V_b (PLO #2) | 63.8 W | Watts | 82 W max | P |

|   | AVERAGE CURRENT (I_V) (PLO #2) | 2.2 A | Amps | N/A | N/A |
| 14  | +28V MLB bus power = I_V \times V_b (PLO #2) | 63.8 W | Watts | 82 W max | P |

|   | AVERAGE CURRENT (I_V) (PLO #2) | 2.2 A | Amps | N/A | N/A |
| 20  | +28V MLB bus power = I_V \times V_b (PLO #2) | 63.8 W | Watts | 82 W max | P |

|   | AVERAGE CURRENT (I_V) (PLO #2) | 2.2 A | Amps | N/A | N/A |

Circle Test: CPT / LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234, SN: 105, 3-17-99

Test Systems Engineer: [Name]

Date: MAR 17 1999

Customer Representative (Flight Hardware Only)

Date: MAR 7 1999

Quality Control

Date: MAR 7 1999

A-12
### TEST DATA SHEET 4 (Sheet 1 of 2)

+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.2)

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<td>Peak Current = I_p</td>
<td>1.1 Amps</td>
<td>1.3 amps max</td>
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<td>3.2.4.2.2.2</td>
<td>From 2 to 4 seconds</td>
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<td></td>
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<tr>
<td>Peak Current = I_p</td>
<td>1.69 Amps</td>
<td>1.3 amps max</td>
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<td>3.2.4.2.2.3</td>
<td>From 4 to 6 seconds</td>
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<td>Peak Current = I_p</td>
<td>1.67 Amps</td>
<td>1.3 amps max</td>
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<td>3.2.4.2.2.4</td>
<td>From 6 to 8 seconds</td>
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<td>Peak Current = I_p</td>
<td>1.073 Amps</td>
<td>1.3 amps max</td>
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<td>Eight Sec. Integrated Current Measurement:</td>
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<td>Current</td>
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<td>dI/dT</td>
<td>3/0.2 mA/µs</td>
<td>744 mA/µs *</td>
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<td>Peak Current = I_p</td>
<td>8.18 Amps</td>
<td>11.5 Amps</td>
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* Refer to Figure 9.

Bus current during the I/H, D period

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<td>9.69 mA</td>
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Circle Test: **CPT**

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 37323 S/N: 105

Test Systems Engineer: [Signature] Date: MAR 17 1999

Quality Control: [Signature] Date: MAR 17 1999

Customer Representative (Flight Hardware Only) Date: MAR 17 1999
X=996.1 mSec
Y=55.0274 mV
CAP TIM BUF

Peak Current = \( \frac{20 \text{ mA}}{10 \text{ mA}} \times 55.027 \text{ mV} = 1100 \text{ mA} \)

\[ \sqrt{1.1} \text{ A} \]

Current 1/4, 0.5 Period = \( \frac{678.8 \text{ mV} \times 20 \text{ mA}}{10 \text{ mA}} = 13.57 \text{ mA} \)

P/N: 1331780-2  SN: 105

PLB  I/H O Current  TDS-4  Test Eng.  Date: 5-16-99

Quality  MAR 7 1999
\[ Y = -254.55 \mu \text{V} \quad \Delta Y = 581.8 \mu \text{V} \]

**CAP TIM REC**

70.0 m

10.0 m

/Div

Rea1

V

200 mA/10 mV

0.0 A

-10.0 m

Fx dy X 2.0 3.24 2.2 2 2-4 Sec Sec

Peak Current = 200 mA/10 mV \times 54.5 mV = 1090 mA

= 1.09 A

Current I/H, O Period = 581.8 mV \times 200 mA/10 mV = 116.62 mA

S/N: 373234
P/N: 1331780-2 5N' 105
PLB I/H, O Current
Peak Current
TDS-4

Test End: 9

Quality (7A 200) MAR 1 7 1999

Date: 3-16-99
\[ X = 4.8961 \text{ Sec} \]
\[ Y = 375.757 \mu \text{V} \]
\[ \Delta Y = 484.8 \mu \text{V} \]

\[ \text{Peak Current} = 200 \text{mA} \times \frac{1}{10 \text{mV}} \times 54.37 \text{mV} = 10.87 \text{A} \]

\[ \text{Current I/H, D, Period} = 484.8 \text{mV} \times 200 \text{mA/mV} = 96.9 \text{mA} \]
X = 6.6812 Sec
Y = -496.9 μV
ΔY = 678.8 μV

Peak Current = \( \frac{200 \text{ mA}}{10 \mu\text{V}} \times 53.64 \text{ mV} = 1073 \text{ mA} \)

Current V/H.D Period = 678.8 μV \times 200 \text{ mA/10 μV} = 13.57 \text{ mA}

S/N: 373234
PN: 1331760-2
SN: 105

Test Eng. (E) Mars 1, 1989

Quality: (E) Mars 1, 1989
X = 7.9961 Sec
Y = 41.9108 mV

MICAP TIM REC
70.0 m

Current = 200 mA/mV x 41.91 mV = 838.2 mA

Ave Current = \frac{current}{8 \text{ sec}} = 104.77 mA

S/N: 373234
P/N: 133780-2
SN: 105
Integrated Current: 329.225

Test Eng: [Signature]

Date: 3/17/99

Quality: [Signature]

MAR 17 1999
Y = 472.724 \mu \Delta Y = 409.0 \text{mV}

Peak Current = \frac{200 \text{mV}}{10 \text{mV}} \times 409.0 \text{mV} = 8180 \text{mA} = 8.18 \text{A}

S/N: 373234
PN: 131720
SN: 105
Test Ens. Q:\U 000 MAR 17 1985

SL: Pro Turn-On Transient

- 100mA

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0
0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0

200 mA/10 mV

Row 1

CAP TIM BUF
$X = 10.17\text{ms}$ \hspace{0.5cm} $\Delta X = 15.62\mu\text{s}$

$Y_a = 62.7237\text{m}$ \hspace{0.5cm} $\Delta Y_a = 242.1\text{mV}$

$Y = 62.7273\text{m}$ \hspace{0.5cm} $\Delta Y = 242.3\text{mV}$

CAP TIM BUF

470 m

80.0 m

/Div

Reul

V

$200 \text{mA/}10\text{mV}$

$\frac{20 \text{ mA}}{242.3 \text{ mV}} \times 242.3 \text{ mV} = 48.46 \text{ mA}$

$\frac{dt}{dt} = 15.62 \mu\text{sec}$

$\frac{dv}{dt} = 310.24 \text{ mA/} \mu\text{sec}$

Test Eng: (Signature)

Quality:

Date: 3-12-99

Signature:

MAR 11 1999
### Bus current during warm cal, cold cal & Nadir

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<td>Cold cal</td>
<td>11.21 mA</td>
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<td>Nadir</td>
<td>19.06 mA</td>
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<td>3.2.4.2.2.7((5))</td>
<td>WARM CAL (MOTORS OFF)</td>
<td>0.01 mA</td>
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Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 37323 4  S/N: 105

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date
AMSU A1-17 A1.EXE:62 WARM CAL MODE

[5] DIGITAL A DATA ELEMENT 0000
[6] DIGITAL B DATA ELEMENT 00
[7] ANALOG DATA ELEMENT 00

[9] MODULE POWER = CONNECT
[10] SURVIVAL HEATER POWER = OFF
[11] MODULE TOTALLY OFF = ON
[12] SCANR A1 - 1 POWER = OFF
[14] ANTENNA IN WARM CAL POSIT = YES

COMANDS
POWER [4] ON
SELECT TOUCHSCREEN BUTTON 3

ANTENNA IN COLD CAL POSIT = NO [15]
ANTENNA IN NADIR POSITION = NO [16]
ANTENNA IN FULL SCAN MODE = NO [17]
PLL POWER = PLL0 # 1 [18]
COLD CAL POSITION MSB = ZERO [19]
COLD CAL POSITION LSB = ZERO [20]
PRINT [3] FULL
[1] RETURN

3.2.4.2.2.7 Step 6 TDS-4

PLB Bus Current
WARM CAL
MOTORS OFF

S/N: 373234
P/N: 1331720-2 S/N: 105

Test Eng: Date: 3-17

Quality: 7A 200 MAR 17 1999
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### Digital B Data

**WARM CAL Mode**

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### Analog Data

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### Antenna Drive Motor Current (AVRG)

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### Signal Processing +15 VDC

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### Receiver Mixer/IF +10 VDC

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### O. Voltage

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<td>Measured/ Calculated</td>
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<td>-----------</td>
<td>----------------------</td>
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<tr>
<td>3</td>
<td>+28 V ATB Bus Voltage (V&lt;sub&gt;at&lt;/sub&gt;) (Measured)</td>
<td>28.0 ±0.5 Volts</td>
</tr>
<tr>
<td>4</td>
<td>Av. Current (I&lt;sub&gt;a&lt;/sub&gt;)</td>
<td>1.75 mA</td>
</tr>
<tr>
<td>5</td>
<td>+28 V ATB Operating Power = I&lt;sub&gt;a&lt;/sub&gt; X V&lt;sub&gt;at&lt;/sub&gt;</td>
<td>71.4 mW</td>
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</table>

Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

SN: 105

Test Systems Engineer Date: 01/06/99

Customer Representative (Flight Hardware Only) Date: MAR 17 1999

Quality Control Date: 3-16-99

A-15
## TEST DATA SHEET 6

+10 V Interface Bus Voltage (Paragraph 3.2.4.2.4)

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Av. Current ($I_a$)</td>
<td>6.52 mA</td>
<td>10 mA max</td>
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<td>3</td>
<td>+10 V Interface Bus ($V_{ib}$) (Measured)</td>
<td>9.17 Volts</td>
<td>9.0 ±1.0 V</td>
<td>P</td>
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<tr>
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<td>+10 V Interface Bus Power = $I_a \times V_{ib}$</td>
<td>6.75 mW</td>
<td>100 mW max</td>
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</tr>
</tbody>
</table>

Circle Test: CPT

METSAT/AMSU-A1 System P/N IS-1331720

Customer Representative
(Flight Hardware Only)

Shop Order: 37223
S/N: 105

Test Systems Engineer
Date: 3/16/99

Quality Control
Date: 3/14/99
### 1.248 MHz Clock Signal Verification (Paragraph 3.2.4.3.2.1)

**1.248 CLOCK SIGNAL**

**ATTACH PHOTOGRAPH OR PLOT HERE**

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
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<tbody>
<tr>
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</tr>
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<td></td>
<td>Clock Amplitude</td>
<td>8.92 Volts</td>
<td>9.0 ±1.0 V</td>
<td>P</td>
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</tbody>
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Circle Test: [ ] CPT [ ] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Customer Representative (Flight Hardware Only) Date: MAR 17 1999

Test Systems Engineer Date: 3/16/99

Quality Control Date: 3/16/99

Shop Order: 372224

S/N: 01

A-18
**TEST DATA SHEET 9**  
"C1" Shift Pulse Verification (Paragraph 3.2.4.3.2.2)

"C1" SHIFT PULSE  
Attach Photograph OR Plot Here

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Timing (A) *</td>
<td>48.0 µs</td>
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<td>P</td>
</tr>
<tr>
<td>Pulse Timing (B) *</td>
<td>12.4 µs</td>
<td>12 µs ± 10%</td>
<td>P</td>
</tr>
<tr>
<td>Pulse Amplitude</td>
<td>9.0 Volts</td>
<td>9.0 ± 1.0 V</td>
<td>P</td>
</tr>
</tbody>
</table>

* Refer to Figure 13 for location of the pulse timing A and B.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720
Shop Order: 37228 Y  S/N: 105

Test Systems Engineer  Date  3/16/99

Customer Representative (Flight Hardware Only)  Date  3/17/99

Quality Control  Date  3/16/99
"A1" SELECT PULSE
Attach Photograph or Plot Here

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Pulse Timing (F) *</td>
<td>960 μs</td>
<td>961.5 μs ± 10%</td>
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</tr>
<tr>
<td>Select Pulse Amplitude</td>
<td>8.5 Volts</td>
<td>9.0 ± 1.0 V</td>
<td>P</td>
</tr>
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</table>

* Refer to Figure 13 for location of the pulse timing F

Circle Test: LPT
METSAT/AMSU-A1 System P/N IS-1331720
Shop Order: 30234 S/N: 105
Test Systems Engineer: 3/16/99
Date: 3/16/99
Customer Representative (Flight Hardware Only) Date: 3/16/99
Quality Control Date: 3/16/99
### TEST DATA SHEET 11

"8 Seconds" Frame Sync Pulse (Paragraph 3.2.4.3.2.4)

"8 SECONDS" FRAME SYNC PULSE

Attach Photograph or Plot Here

(Record of "C" timing only is required)

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
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<td>1*</td>
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<td>8 Sec</td>
<td>8 Sec ±10%</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Frame Sync Pulse Timing (C)*</td>
<td>247 µs</td>
<td>240.4 µs ±10%</td>
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</tr>
<tr>
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<td>Frame Sync Pulse Amplitude</td>
<td>8.72 Volts</td>
<td>9.0 ±1.0 V</td>
<td>F</td>
</tr>
</tbody>
</table>

* Refer to Figure 13 for location of the timing pulses for G and C.

---

Circle Test: □ LPT

METSAT/AMSU-A1 System P/N IS-1331720  
Shop Order 373234  
S/N: 105  

Test Systems Engineer Date: 3/6/99

Customer Representative (Flight Hardware Only) Date: 3/17/99

Quality Control Date: 3/16/99

---

A21
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 8 seconds Frame sync pulse.

Verify that the sync pulse between H and C is as shown in Figure 19.

TIME MEASURED: 1.205 ms

TIME REQUIRED: 1.2 ms ±10%

PASS/FAIL: 

ATTACH PHOTOGRAPH OR PLOT HERE

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 

SN: 

Test Systems Engineer 3/16/99

Customer Representative (Flight Hardware Only) 3-17-99

Quality Control 3/16/99

A-22
TEST DATA SHEET 12 (Sheet 2 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the C1 Shift pulse.

Verify that the sync pulse between I and E is as shown in Figure 19.

TIME MEASURED: 24 μs

TIME REQUIRED: 24 μs ±1 μs

PASS/FAIL

Circle Test: CPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

S/N: 01

Test Systems Engineer: [Signature] 3/16/99

Date

Customer Representative (Flight Hardware Only)  MAR 17 1999

Date

Quality Control  3/16/99

Date

A23
TEST DATA SHEET 13
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 1.248 MHz clock.

Verify that the sync pulse between I and J is as shown in Figure 19.

PASS/FAIL  PASS

ATTACH PHOTOGRAPH OR PLOT HERE
Tek Stop: 50MS/s

124kHz

Clock

2->

Ch1 5 V Ch2 5 V

INSYNC

A1 Select

Δ: 4.24μs
@: -2.8μs

17 Mar 1999
14:56:41

S/N: 373234
P/N: 1331720-2
SN: 105

3.2.4.3.2.5 SYNCH SIG RELATIONSHIP
TDS-13

Test Eng.: 3-17-99

Quality: 3-17-99
**Test Data Sheet 14**

Commands and Digital-B Telemetry Verification (Paragraphs 3.2.4.3.3.1, 3.2.4.3.3.2, 3.2.4.3.3.3, and 3.2.4.3.3.4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Digital-B Commands Verification Via STE</th>
<th>Visual Inspection</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Command</td>
<td>Observed</td>
<td>Required</td>
</tr>
<tr>
<td>3.2.4.3.3.1</td>
<td>Scanner A1-1</td>
<td>✓</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Scanner A1-2</td>
<td>✓</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Module Power</td>
<td>✓</td>
<td>Disconnect</td>
</tr>
<tr>
<td></td>
<td>Survival Htr. Power</td>
<td>✓</td>
<td>OFF</td>
</tr>
<tr>
<td>3.2.4.3.3.2</td>
<td>Survival Heater ON</td>
<td>✓</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>Survival Heater OFF</td>
<td>✓</td>
<td>OFF</td>
</tr>
<tr>
<td>3.2.4.3.3.3</td>
<td>Module Power Connect</td>
<td>✓</td>
<td>Connect</td>
</tr>
<tr>
<td></td>
<td>Module Power</td>
<td>✓</td>
<td>Connect</td>
</tr>
<tr>
<td>3.2.4.3.3.4</td>
<td>PLLO#2</td>
<td>✓</td>
<td>PLLO#2</td>
</tr>
<tr>
<td></td>
<td>PLL Power PLLO#1</td>
<td>✓</td>
<td>PLLO#1</td>
</tr>
</tbody>
</table>

Circle Test: LPT

METSAT/AMSU-A1 System P/N IS-1331720

Test Systems Engineer

Date: 3/16/99

Customer Representative (Flight Hardware Only)

Date: 3/17/99

Quality Control

Date: 3/17/99
TEST DATA SHEET 15
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 1)

<table>
<thead>
<tr>
<th>Test</th>
<th>Digital &quot;B&quot; Verification</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Command</td>
<td>Observed</td>
</tr>
<tr>
<td>1</td>
<td>Module Power</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Survival Heater</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Scanner A1 Power</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Scanner A2 Power</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Antenna Warm Cal Pos.</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>Antenna Cold Cal Pos.</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>Antenna NADIR Position</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Antenna Full Scan</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>PLL Power</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>Cold MSB</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>Cold LSB</td>
<td>✓</td>
</tr>
</tbody>
</table>

Circle Test:  [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234
S/N: 105

Test Systems Engineer: 71699
Date: 3/6/99

Customer Representative (Flight Hardware Only) Date: MAR 17 1999

Quality Control: 51499
Date: 3/16/99

A-26
## TEST DATA SHEET 16
Scanner Commands Verification (Paragraph 3.2.4.3.5, Step 2)

<table>
<thead>
<tr>
<th>Test</th>
<th>Digital &quot;B&quot; Verification</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Command</td>
<td>Observed</td>
</tr>
<tr>
<td>1</td>
<td>Module Power</td>
<td>✚</td>
</tr>
<tr>
<td>2</td>
<td>Survival Heater</td>
<td>✚</td>
</tr>
<tr>
<td>3</td>
<td>Scanner A1 Power</td>
<td>✚</td>
</tr>
<tr>
<td>4</td>
<td>Scanner A2 Power</td>
<td>✚</td>
</tr>
<tr>
<td>5</td>
<td>Antenna Warm Cal Pos.</td>
<td>✚</td>
</tr>
<tr>
<td>6</td>
<td>Antenna Cold Cal Pos.</td>
<td>✚</td>
</tr>
<tr>
<td>7</td>
<td>Antenna NADIR Position</td>
<td>✚</td>
</tr>
<tr>
<td>8</td>
<td>Antenna Full Scan</td>
<td>✚</td>
</tr>
<tr>
<td>9</td>
<td>PLL Power</td>
<td>✚</td>
</tr>
<tr>
<td>10</td>
<td>Cold MSB</td>
<td>✚</td>
</tr>
<tr>
<td>11</td>
<td>Cold LSB</td>
<td>✚</td>
</tr>
</tbody>
</table>

Circle Test: [LPT]

**METSAT/AMSU-A1 System P/N IS-1331720**

Shop Order: 373734
S/N: 105

Test Systems Engineer: [Signature]
Date: 3/16/99

Customer Representative (Flight Hardware Only) Date: 3/17/99

Quality Control Date: 3/16/99
### Test Data Sheet 17

**Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 3)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Command</th>
<th>Digital &quot;B&quot; Verification</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Module Power</td>
<td>✓</td>
<td>CONNECT</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Survival Heater</td>
<td>✓</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Scanner A1 Power</td>
<td>✓</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Scanner A2 Power</td>
<td>✓</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Antenna Warm Cal Pos.</td>
<td>✓</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Antenna Cold Cal Pos.</td>
<td>✓</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Antenna NADIR Position</td>
<td>✓</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Antenna Full Scan</td>
<td>✓</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PLL Power</td>
<td>✓</td>
<td>PLLO#1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cold MSB</td>
<td>✓</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Cold LSB</td>
<td>✓</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

---

**Circle Test:** LPT  
METSAT/AMSU-A1 System P/N IS-1331720

**Shop Order:** S/N:  
**Date:** MAR 17 1999  
**Quality Control:** Date

Customer Representative (Flight Hardware Only)  
Test Systems Engineer Date  
Customer Representative (Flight Hardware Only) Date
### TEST DATA SHEET 18

**Scanner Positions Commands (Paragraph 3.2.4.3.3.6)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Digital &quot;B&quot; Verification</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step/Description</td>
<td>Observed</td>
</tr>
<tr>
<td>1-Warm Cal.</td>
<td>MSB</td>
<td>✔</td>
</tr>
<tr>
<td>2-Cold Cal. Pos.</td>
<td>MSB</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>LSB</td>
<td>✔</td>
</tr>
<tr>
<td>3-Cold Cal. Pos.</td>
<td>MSB</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>LSB</td>
<td>✔</td>
</tr>
<tr>
<td>4-Cold Cal. Pos.</td>
<td>MSB</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>LSB</td>
<td>✔</td>
</tr>
<tr>
<td>5-Cold Cal. Pos.</td>
<td>MSB</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>LSB</td>
<td>✔</td>
</tr>
<tr>
<td>6-NADIR</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>7-Warm Cal</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

**Circle Test:** LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 372234  S/N: 105

Test Systems Engineer: [Signature] 3/16/99

Customer Representative (Flight Hardware Only): [Signature] 3/16/99

Quality Control: [Signature] 3/16/99

Date: MAR 17 1999

Date: 3/16/99
**TEST DATA SHEET 19**

Digital-A Data Output Full Scan Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

<table>
<thead>
<tr>
<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>[I]</td>
<td>0001</td>
<td>Sync Sequence Byte 1</td>
<td>(255)</td>
<td>255</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>0002</td>
<td>Sync Sequence Byte 2</td>
<td>(255)</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0003</td>
<td>Sync Sequence Byte 3</td>
<td>(255)</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial Number</td>
<td>(17)</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>[III]</td>
<td>0005</td>
<td>Digital-B Data Byte 1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0006</td>
<td>Digital-B Data Byte 2</td>
<td>14</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0007</td>
<td>Digital-B Data Byte 3</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0008</td>
<td>Digital-B Data Byte 4</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

AMSU A1 Identification Words (data entered in decimal system)

<table>
<thead>
<tr>
<th>AMSU-A1 S/N</th>
<th>Binary</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>00000001</td>
<td>1</td>
</tr>
<tr>
<td>102</td>
<td>00000101</td>
<td>5</td>
</tr>
<tr>
<td>103</td>
<td>00010001</td>
<td>9</td>
</tr>
<tr>
<td>104</td>
<td>00010101</td>
<td>13</td>
</tr>
<tr>
<td>105</td>
<td>00010001</td>
<td>17</td>
</tr>
<tr>
<td>106</td>
<td>00010101</td>
<td>21</td>
</tr>
<tr>
<td>107</td>
<td>00011001</td>
<td>25</td>
</tr>
<tr>
<td>108</td>
<td>00011101</td>
<td>29</td>
</tr>
<tr>
<td>109</td>
<td>00100001</td>
<td>33</td>
</tr>
</tbody>
</table>

** Required value = 14 when PLL #1 is active; and = 6 when PLL #2 is active.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 105

Test Systems Engineer DATE: 3/16/99 Date: 3/16/99

Customer Representative Date: 3/17/99
(Flight Hardware Only) Quality Control Date: 3/16/99

A-30
5 ] DIGITAL A DATA  ELEMENT 0000
6 ] DIGITAL B DATA  ELEMENT 00
7 ] ANALOG DATA  ELEMENT 00

9 ] MODULE POWER = CONNECT  COMMANDS
10 ] SURVIVAL HEATER POWER = OFF  ANTENNA IN COLD CAL POSIT = NO [ 15 ]
11 ] MODULE TOTALLY OFF = ON  ANTENNA IN NADIR POSITION = NO [ 16 ]
12 ] SCANNER A1 - 1 POWER = ON  ANTENNA IN FULL SCAN MODE = YES [ 17 ]
13 ] SCANNER A1 - 2 POWER = ON  PLL POWER = PLL0 # 1 [ 18 ]
14 ] ANTENNA IN WARM CAL POSIT = NO  COLD CAL POSITION MSB = ZERO [ 19 ]

POWER [ 4 ] ON
SELECT TOUCHSCREEN BUTTON 3

TDS 19
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
<th>ELEMENT</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SYNC SEQUENCE</td>
<td>BYTE 1</td>
<td>572</td>
<td>SCENE DATA</td>
<td>BP 17</td>
</tr>
<tr>
<td>2</td>
<td>SYNC SEQUENCE</td>
<td>BYTE 2</td>
<td>574</td>
<td>CH 8</td>
<td>16505</td>
</tr>
<tr>
<td>3</td>
<td>SYNC SEQUENCE</td>
<td>BYTE 3</td>
<td>576</td>
<td>CH 9</td>
<td>17671</td>
</tr>
<tr>
<td>4</td>
<td>UNIT ID AND SERIAL NO</td>
<td>578</td>
<td>CH 10</td>
<td>17070</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>DIGITAL B DATA</td>
<td>BYTE 1</td>
<td>580</td>
<td>CH 11</td>
<td>19275</td>
</tr>
<tr>
<td>6</td>
<td>DIGITAL B DATA</td>
<td>BYTE 2</td>
<td>581</td>
<td>CH 12</td>
<td>19196</td>
</tr>
<tr>
<td>7</td>
<td>DIGITAL B DATA</td>
<td>BYTE 3</td>
<td>584</td>
<td>CH 13</td>
<td>18628</td>
</tr>
<tr>
<td>8</td>
<td>DIGITAL B DATA</td>
<td>BYTE 4</td>
<td>586</td>
<td>CH 14</td>
<td>20720</td>
</tr>
<tr>
<td>9</td>
<td>REFLECTOR 1 POSITION</td>
<td>1</td>
<td>588</td>
<td>CH 15</td>
<td>16905</td>
</tr>
<tr>
<td>10</td>
<td>REFLECTOR 2 POSITION</td>
<td>1</td>
<td>590</td>
<td></td>
<td>2410</td>
</tr>
<tr>
<td>11</td>
<td>REFL 1 POS 1</td>
<td>2ND LOOK</td>
<td>592</td>
<td>REFLECTOR 1 POSITION</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>REFL 1 POS 1</td>
<td>2ND LOOK</td>
<td>594</td>
<td>REFLECTOR 2 POSITION</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>REFL 2 POS 1</td>
<td>2ND LOOK</td>
<td>596</td>
<td>SCENE DATA</td>
<td>BP 18</td>
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<tr>
<td>14</td>
<td>REFL 2 POS 1</td>
<td>2ND LOOK</td>
<td>598</td>
<td>CH 3</td>
<td>16332</td>
</tr>
<tr>
<td>15</td>
<td>SCENE DATA</td>
<td>BP 1</td>
<td>600</td>
<td>CH 4</td>
<td>16807</td>
</tr>
<tr>
<td>16</td>
<td>SCENE DATA</td>
<td>BP 2</td>
<td>602</td>
<td>CH 5</td>
<td>17124</td>
</tr>
<tr>
<td>17</td>
<td>SCENE DATA</td>
<td>BP 3</td>
<td>604</td>
<td>CH 6</td>
<td>16877</td>
</tr>
<tr>
<td>18</td>
<td>SCENE DATA</td>
<td>BP 4</td>
<td>606</td>
<td>CH 7</td>
<td>16505</td>
</tr>
<tr>
<td>19</td>
<td>SCENE DATA</td>
<td>BP 5</td>
<td>608</td>
<td>CH 8</td>
<td>16506</td>
</tr>
<tr>
<td>20</td>
<td>SCENE DATA</td>
<td>BP 6</td>
<td>610</td>
<td>CH 9</td>
<td>17671</td>
</tr>
<tr>
<td>21</td>
<td>SCENE DATA</td>
<td>BP 7</td>
<td>612</td>
<td>CH 10</td>
<td>17062</td>
</tr>
<tr>
<td>22</td>
<td>SCENE DATA</td>
<td>BP 8</td>
<td>614</td>
<td>CH 11</td>
<td>19275</td>
</tr>
<tr>
<td>23</td>
<td>SCENE DATA</td>
<td>BP 9</td>
<td>616</td>
<td>CH 12</td>
<td>19218</td>
</tr>
<tr>
<td>24</td>
<td>SCENE DATA</td>
<td>BP 10</td>
<td>618</td>
<td>CH 13</td>
<td>18656</td>
</tr>
<tr>
<td>25</td>
<td>SCENE DATA</td>
<td>BP 11</td>
<td>620</td>
<td>CH 14</td>
<td>20727</td>
</tr>
<tr>
<td>26</td>
<td>SCENE DATA</td>
<td>BP 12</td>
<td>622</td>
<td>CH 15</td>
<td>16905</td>
</tr>
<tr>
<td>27</td>
<td>SCENE DATA</td>
<td>BP 13</td>
<td>624</td>
<td>REFLECTOR 1 POSITION</td>
<td>19</td>
</tr>
<tr>
<td>28</td>
<td>SCENE DATA</td>
<td>BP 14</td>
<td>626</td>
<td>REFLECTOR 2 POSITION</td>
<td>19</td>
</tr>
<tr>
<td>29</td>
<td>SCENE DATA</td>
<td>BP 15</td>
<td>628</td>
<td>REFL 1 POS 1</td>
<td>2ND LOOK</td>
</tr>
<tr>
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**AZONIX DATA**

Full Scan Mode

16-MAR-99 07:55:29 PAGE 9
## TEST DATA SHEET 20

Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

SN: 105

Test Systems Engineer: [Signature] 3/16/99

Date

Customer Representative: [Signature] MAR 17 1999

(Flight Hardware Only)

Quality Control: [Signature] 3/16/99

Date
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**Screen Only [2]**

**Print [3]**

**Full [1]**

**Return**

Select Touchscreen Button 2
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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required = 16,500 ± 4000 counts.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

S/N: 105

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

MAR 17 1999

A-32
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* Value is from the STE printout sheets. Copying data to this sheet is optional.
** For S/N 101 through 104.
*** For S/N 105 and up.

(Continued on Sheet 2)
## TEST DATA SHEET 22 (Sheet 2 of 2)

Full Scan Mode Temperature Sensors Section [VI (Paragraph 3.2.4.3.4.1)]

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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** = Count of 24,552 +1765,-1308.

Circle Test: [CPT] [LPT]

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

S/N: 10

Test Systems Engineer: [Signature] [Date: 3/16/99]

Customer Representative (Flight Hardware Only) [Signature] [Date: MAR 17 1999]

Quality Control: [Signature] [Date: 3/16/99]
### Digital A Temperatures 1 to 16

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Select touchscreen button 2
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[21] UP  [22] DOWN

POWER [4] ON
SELECT TOUCHSCREEN BUTTON 2
TEST DATA SHEET 23
Digital-A Data Output Warm Cal Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.2)

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* AMSU A1 Identification Words
  (data entered in decimal system)

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Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720
Shop Order: 37323X
S/N: 105

Customer Representative (Flight Hardware Only) Date

Quality Control Date

A-35
AMSU  A1-17  A1.EXE;62  WARM CAL MODE
[ 5 ] DIGITAL A DATA  ELEMENT  00000
[ 6 ] DIGITAL B DATA  ELEMENT  00
[ 7 ] ANALOG DATA     ELEMENT  00

[10 ] SURVIVAL HEATER POWER =    OFF  ANTEenna in NADIR POSITION = NO [ 16 ]
[12 ] SCANNER A1 - 1 POWER =    ON    PLL POWER =    PLLO # 1 [ 18 ]
[14 ] ANTEenna in WARM CAL POSIT = YES    COLD CAL POSITION LSB =  ZERO [ 20 ]

POWER  [ 4 ] ON  SELECT TOUCHSCREEN BUTTON 3

TDS23
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---|---|---|---
SCANNER A1-1 POWER | ON | ON | ON
SCANNER A1-2 POWER | ON | ON | ON
PLL POWER | PLL # 1 | PLL # 1 | PLL # 1
ANTENNA IN WARM CAL POSITION MODE | YES | YES | YES
ANTENNA IN COLD CAL POSITION MODE | NO | NO | NO
ANTENNA IN NADIR POSITION MODE | NO | NO | NO
ANTENNA IN FULL SCAN MODE | NO | NO | NO
SURVIVAL HEATER POWER | OFF | OFF | OFF
MODULE POWER | CONNECT | CONNECT | CONNECT
COLD CAL POSITION MSB | ZERO | ZERO | ZERO
COLD CAL POSITION LSB | ZERO | ZERO | ZERO

ANALOG DATA

| DESCRIPTION | VALUE | DEG C | VALUE | DEG C | VALUE | DEG C |
---|---|---|---|---|---|---|
A1-1 SCANNER MOTOR TEMPERATURE | 214 | 24.9 | 214 | 24.9 | 214 | 24.9 |
A1-2 SCANNER MOTOR TEMPERATURE | 214 | 24.5 | 214 | 24.5 | 214 | 24.5 |
A1-1 RF SHELF TEMPERATURE | 214 | 22.0 | 214 | 22.0 | 214 | 22.0 |
A1-2 RF SHELF TEMPERATURE | 215 | 22.9 | 215 | 22.9 | 215 | 22.9 |
A1-1 WARM LOAD TEMPERATURE | 214 | 23.8 | 214 | 23.8 | 214 | 23.8 |
A1-2 WARM LOAD TEMPERATURE | 214 | 23.9 | 214 | 23.9 | 214 | 23.9 |

| DESCRIPTION | VALUE | AMPS/ VOLTS | VALUE | AMPS/ VOLTS | VALUE | AMPS/ VOLTS |
---|---|---|---|---|---|---|
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG) | 4 | 1.86 | 4 | 1.86 | 4 | 1.86 |
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG) | 4 | 1.86 | 4 | 1.86 | 4 | 1.86 |
ANTENNA DRIVE +15 VDC | 167 | 14.91 | 167 | 14.91 | 167 | 14.91 |
ANTENNA DRIVE -15 VDC | 149 | -15.05 | 149 | -15.05 | 149 | -15.05 |
ANTENNA DRIVE -15 VDC | 149 | -14.95 | 149 | -14.95 | 149 | -14.95 |
RECEIVER AMPLIFIER +8 VDC | 157 | 8.05 | 157 | 8.05 | 157 | 8.05 |
SIGNAL PROCESSOR +5 VDC | 143 | 5.07 | 143 | 5.07 | 143 | 5.07 |
ANTENNA DRIVE +5 VDC | 143 | 5.02 | 143 | 5.02 | 143 | 5.02 |
RECEIVER MIXER/IF +10 VDC | 167 | 10.03 | 167 | 10.03 | 167 | 10.03 |
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC | 142 | -14.90 | 142 | -14.90 | 142 | -14.90 |
L.O. VOLTAGE (CHANNEL 8) VDC | 172 | 10.00 | 172 | 10.00 | 172 | 10.00 |
L.O. VOLTAGE (CHANNEL 7) VDC | 170 | 10.06 | 170 | 10.06 | 170 | 10.06 |
L.O. VOLTAGE (CHANNEL 6) VDC | 173 | 10.00 | 173 | 10.00 | 173 | 10.00 |
L.O. VOLTAGE (CHANNEL 5) VDC | 173 | 10.00 | 173 | 10.00 | 173 | 10.00 |
L.O. VOLTAGE (CHANNEL 4) VDC | 173 | 10.00 | 173 | 10.00 | 173 | 10.00 |
L.O. VOLTAGE (CHANNEL 3) VDC | 173 | 10.00 | 173 | 10.00 | 173 | 10.00 |
L.O. VOLTAGE (CHANNEL 2) VDC | 171 | 10.11 | 171 | 10.11 | 171 | 10.11 |
PLLO # 2 LOCK DETECT | 4 | 0.08 | 4 | 0.08 | 4 | 0.08 |
PLLO # 1 LOCK DETECT | 218 | 4.36 | 218 | 4.36 | 218 | 4.36 |
L.O. VOLTAGE (CHANNEL 15) VDC | 167 | 14.91 | 167 | 14.91 | 167 | 14.91 |
### PRT Temperatures

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### Thermocouple Temperatures

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### Notes:
- **PRT Temperatures**: Temperatures measured at various points in the system.
- **Variable Target**: Temperatures at variable target locations.
- **Fixed Target**: Temperatures at fixed target locations.
- **Baseplate**: Temperatures at baseplate locations.
- **Thermocouple Temperatures**: Temperatures measured using thermocouples at specific locations.

### Additional Notes:
- **Degrees K**: Temperatures are measured in Kelvin (°K).
- **Measurement Locations**: Temperatures are measured at various locations within the system, including fixed target shroud, variable target shroud, fixed target N2, variable target N2, heater N2, fixed target flow meter, variable target flow meter, baseplate heater N2, baseplate N2, baseplate flow meter, and adjunct radiators.
## TEST DATA SHEET 24

Reflector Position Warm Cal Mode Section (IV) and Reflector Position Nadir Mode Section (IV) (Paragraphs 3.2.4.3.4.2 and 3.2.4.3.4.4)

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WC = Warm Cal
15 = Nadir Position

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WC = Warm Cal
15 = Nadir Position

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

Circle Test: LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 37323

S/N: 6

Test Systems Engineer: 3/4/99

Customer Representative (Flight Hardware Only) Date

Quality Control: 3/4/99 Date
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SELECT TOUCHSCREEN BUTTON 2

TDS 24
**REFLECTOR POSITIONS**

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**POWER** [4] ON

**SELECT TOUCHSCREEN BUTTON** [2]

**PRINT** [3] FULL

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* Actual counts from computer printout. Rewriting counts on this data sheet is optional. ** Required = 16,500 ± 4000 counts.

Circle Test: [CPT] LPT


Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date
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POWER [4] ON

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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** For S/N 101 through 104.

*** For S/N 105 and up.

(Continued on Sheet 2)
## TEST DATA SHEET 26 (Sheet 2 of 2)
Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** = Count of 24,552 +1765,-1308.

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A-39
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**DIGITAL A TEMPERATURES 17 TO 32**

**POWER [4] ON**


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[ 21 ] UP

[ 22 ] DOWN


SELECT TOUCHSCREEN BUTTON 2
### TEST DATA SHEET 27

Digital-A Data Output Cold Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.3)

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* AMSU-A1 Identification Words (data entered in decimal system)

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Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: S/N: 373224

Test Systems Engineer 3/16/99

Date

Customer Representative (Flight Hardware Only) 3/16/99

Date

Quality Control 3/16/99

Date
AMSU A1-17 A1.EXE:62 COLD CAL MODE

[ 5 ] DIGITAL A DATA ELEMENT 0000
[ 6 ] DIGITAL B DATA ELEMENT 00
[ 7 ] ANALOG DATA ELEMENT 00

[ 9 ] MODULE POWER = CONNECT

[ 10 ] SURVIVAL HEATER POWER = OFF

[ 11 ] MODULE TOTALLY OFF = ON

[ 12 ] SCANNER A1 - 1 POWER = ON


[ 14 ] ANTENNA IN WARM CAL POSIT = NO

[ 15 ] ANTENNA IN COLD CAL POSIT = YES

[ 16 ] ANTENNA IN NADIR POSITION = NO

[ 17 ] ANTENNA IN FULL SCAN MODE = NO

[ 18 ] PLL POWER = PLL0 # 1

[ 19 ] COLD CAL POSITION MSB = ZERO

[ 20 ] COLD CAL POSITION LSB = ZERO

SELECT TOUCHSCREEN BUTTON 3


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## TEST DATA SHEET 28 (Sheet 1 of 2)

Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], and Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, and 3.2.4.3.4.4)

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CC = Cold Cal

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

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Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 32323

S/N: 1060

Test Systems Engineer: P. Haas

MAR 17 1999

Date

Customer Representative (Flight Hardware Only)

3/14/99

Date

Quality Control

3/14/99

Date
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**SELECT TOUCHSCREEN BUTTON 2**
**TEST DATA SHEET 28 (Sheet 2 of 2)**

Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], and Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, and 3.2.4.3.4.4)

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**CC = Cold Cal**

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

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Circle Test: **CPT** LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 247105

Test Systems Engineer: [Signature] MAR 17 1999

Customer Representative (Flight Hardware Only) Date: MAR 17 1999

Quality Control Date: 3/14/99
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POWER [4] ON
SELECT TOUCHSCREEN BUTTON 2

TDS 28
2 of 2
### REFLECTOR POSITIONS

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POWER [4] ON
SELECT TOUCHSCREEN BUTTON 2
**TEST DATA SHEET 29**

Digital-A Data Output Cold Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.3)  
Condition: Cold Cal Position MSB=0 and Cold Cal Position LSB=0

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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.  
** Required = 16,500 ± 4000 counts.

Circle Test: [CFT] LPT  
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 375234 S/N: 105  
Test Systems Engineer: 3/11/99  
Customer Representative: (Flight Hardware Only)  
Date: 3/17/99  
Quality Control: 3/11/99  
Date:


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### Buttons
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- **SCREEN ONLY**: [2]
- **PRINT**: [3]
- **FULL**: [1]
- **RETURN**: [1]
- **UP**: [21]
- **DOWN**: [22]

**Select Touchscreen Button 2**
RADIOMETRIC DATA

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<th>DATA</th>
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POWER [ 4 ] ON
SELECT TOUCHSCREEN BUTTON 2
### TEST DATA SHEET 30 (Sheet 1 of 2)

**Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)**

<table>
<thead>
<tr>
<th>Element</th>
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<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** For S/N 101 through 104.

*** For S/N 105 and up.

(Continued on Sheet 2)
## TEST DATA SHEET 30 (Sheet 2 of 2)

**Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)**

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<th>Pass/ Fail</th>
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<td>DC/DC Converter</td>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** = Count of 24,552 +1765,-1308.

**Circle Test:** CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 729234

S/N: 10

Test Systems Engineer: [Signature] 3/16/99

Date: MAR 17 1999

Customer Representative (Flight Hardware Only) Date: 3/16/99

Quality Control Date: 3/16/99
DIGITAL A TEMPERATURES 17 TO 32

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<td>18498</td>
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<td>13</td>
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POWER [4] ON
SELECT TOUCHSCREEN BUTTON 2
### Digital A Temperatures 31 to 46

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<td>LOAD 5</td>
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**Power**: [4] On
**Screen Only**: [2]
**Print**: [3]
**Full**: [1]
**Return**: [1]

Select Touchscreen Button 2
**TEST DATA SHEET 31**

Digital-A Data Output Nadir Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification

Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.4)

<table>
<thead>
<tr>
<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
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<th>Pass/Fail</th>
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<td>II</td>
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<td>Unit I.D. and Serial N</td>
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<td>III</td>
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* AMSU A1 Identification Words (data entered in decimal system)

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Circle Test: ☐ LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 372234  
S/N: 105

Test Systems Engineer:  
Date: 3/16/99

Customer Representative (Flight Hardware Only)

Date: MAR 17 1999

Quality Control

Date: 3/16/99
AMSU A1-17 A1.EXE;62
[ 5 ] DIGITAL A DATA ELEMENT 0000
[ 6 ] DIGITAL B DATA ELEMENT 00
[ 7 ] ANALOG DATA ELEMENT 00

[ 9 ] MODULE POWER = CONNECT ANTEENA IN COLD CAL POSIT = NO [ 15 ]
[ 10 ] SURVIVAL HEATER POWER = OFF ANTEENA IN NADIR POSITION = YES [ 16 ]
[ 12 ] SCANNER A1 - 1 POWER = ON PLL POWER = PLL0 #1 [ 18 ]
[ 14 ] ANTEENA IN WARM CAL POSIT = NO COLD CAL POSITION LSB = ZERO [ 20 ]

SELECT TOUCHSCREEN BUTTON 3

TDS 31
<table>
<thead>
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<th>ELEMENT</th>
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<th>VALUE</th>
<th>ELEMENT</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
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<td>2</td>
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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts (Unless otherwise indicated).

Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 105

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

MAR 17 1999

A47

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SELECT TOUCHSCREEN BUTTON 2

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POWER [4] ON
SELECT TOUCHSCREEN BUTTON 2
**TEST DATA SHEET 33 (Sheet 1 of 2)**

Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** For S/N 101 through 104.

*** For S/N 105 and up.

(Continued on Sheet 2)
### TEST DATA SHEET 33 (Sheet 2 of 2)
Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

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* Value is from the STE printout sheets. Copying data to this sheet is optional.
** = Count of 24,552 +1765 -1308.

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Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

S/N: 105

Test Systems Engineer: R. Haiz

Date: 3/6/99

Customer Representative (Flight Hardware Only) Date: MAR 17 1999

Quality Control Date: 3/14/99
AMSU A1-17 A1.EXE;62 NADIR MODE

[ 5 ] DIGITAL A DATA ELEMENT 0000
[ 6 ] DIGITAL B DATA ELEMENT 00
[ 7 ] ANALOG DATA ELEMENT 00

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POWER [ 4 ] ON
SELECT TOUCHSCREEN BUTTON 2

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SELECT TOUCHSCREEN BUTTON 2
### TEST DATA SHEET 34

Analog Telemetry Verification by Way of Connector J6 (Paragraph 3.2.4.3.5.1)

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<td>J6-16 +15 V PLL LO Ch 9-14</td>
<td>J2-03</td>
<td>3.43V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>J6-17 *</td>
<td>J2-03</td>
<td>3.44V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>J6-18 L.O. Voltage Channel 15</td>
<td>J2-03</td>
<td>3.46V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>J6-25 PLL LO No. 1 Lock detect</td>
<td>J2-03</td>
<td>4.43V</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>J6-27 A1-2 Drive Motor Curr.</td>
<td>J2-03</td>
<td>2.00V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>J6-28 -15 V Antenna Drive</td>
<td>J2-03</td>
<td>3.04V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>J6-29 -15 V Signal Processing</td>
<td>J2-03</td>
<td>3.04V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>J6-30 L.O. Voltage Channel 4</td>
<td>J2-03</td>
<td>3.50V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>J6-31 L.O. Voltage Channel 6</td>
<td>J2-03</td>
<td>3.48V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>J6-32 L.O. Voltage Channel 8</td>
<td>J2-03</td>
<td>3.49V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>J6-33 -15 V PLL LO Ch 9-14</td>
<td>J2-03</td>
<td>2.70V</td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>J6-34 **</td>
<td>J2-03</td>
<td>3.19V</td>
<td>3.5 ± 2 V</td>
<td>C</td>
</tr>
</tbody>
</table>

* +8.5 V PLL LO Ch 9-14 for S/N 101-104, +10V Mixer Amp for S/N 105 and above.


*** 4.5 ±0.5 when locked, 0.5 ±0.5 when unlocked or OFF. One must be locked.

Circle Test: CP

Test Systems Engineer: [Signature]

Date: [Signature]

Customer Representative: [Signature]

Date: [Signature]

Quality Control: [Signature]

Date: [Signature]

S/N: 105

Shop Order: 373129

A-50
TEST DATA SHEET 35 (Sheet 1 of 2)
Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

<table>
<thead>
<tr>
<th>Description</th>
<th>Measured (Deg. C)</th>
<th>Required (Deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 A1-1 Scanner Motor Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>02 A1-2 Scanner Motor Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>03 A1-1 RF Shelf Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>04 A1-2 RF Shelf Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>05 A1-1 Warm Load Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>06 A1-2 Warm Load Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>07 Ant A1-1 Drv Motor Current</td>
<td></td>
<td>125 mA (Max)</td>
<td></td>
</tr>
<tr>
<td>08 Ant A1-2 Drv Motor Current</td>
<td></td>
<td>125 mA (Max)</td>
<td></td>
</tr>
</tbody>
</table>

(*) Data from the printout sheet. Rewriting data on this space is optional.

(Continued on sheet 2)
### Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

<table>
<thead>
<tr>
<th>Description</th>
<th>(*)</th>
<th>Measured (volts)</th>
<th>Required (volts)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Processing</td>
<td>+15 V</td>
<td></td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Antenna Drive</td>
<td>+15 V</td>
<td></td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Signal Processing</td>
<td>-15 V</td>
<td></td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Antenna Drive</td>
<td>-15 V</td>
<td></td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>+8 V</td>
<td></td>
<td>8.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Signal Processing</td>
<td>+5 V</td>
<td></td>
<td>5.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Antenna Drive</td>
<td>+5 V</td>
<td></td>
<td>5.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Phase Lock Loop Ch 9-14 (a)/Receiver/Mixer IF (b)</td>
<td>+8.5 V</td>
<td></td>
<td>8.5 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Phase Lock Loop Ch 9-14</td>
<td>+15 V</td>
<td></td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Phase Lock Loop Ch 9-14</td>
<td>-15 V</td>
<td></td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #8 Ch-8</td>
<td>10.0 ± 0.5 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #7 Ch-7</td>
<td>10.1 ± 0.5 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #6 Ch-6</td>
<td>10.03 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #3 Ch-3</td>
<td>10.06 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #4 Ch-4</td>
<td>10.02 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>L.O. #5 Ch-5</td>
<td>10.14 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>PLLO No. 2 Lock Detect</td>
<td>4.7 V</td>
<td></td>
<td>(*** )</td>
<td></td>
</tr>
<tr>
<td>PLLO No. 1 Lock Detect</td>
<td>0.8 V</td>
<td></td>
<td>(*** )</td>
<td></td>
</tr>
<tr>
<td>L.O. #15 Ch-15</td>
<td>14.9 V</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
</tbody>
</table>

(*) Data from the printout sheet. Rewriting data on this space is optional.

(**) GDO voltages from the manufacturer data sheet for S/N 101-104; DRO CH3-8 10V, GDO CH15 15V for S/N 105 and above.

(***) Locked PLO voltage 0 to +15 V, other PLO voltage ±15.0 V; one must be locked for S/N 101-104. Locked PLO voltage 4.0 ±1.0 V, other PLO voltage 0.0 ±0.2 V, one must be locked for S/N 105 and above.

(a) For S/N 101 through 104. (b) For S/N 105 and up.

Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 37223

SN: 100

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

A-52
<table>
<thead>
<tr>
<th>Analog Data 1 to 18</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> A1-1 Scanr Motor</td>
</tr>
<tr>
<td><strong>3</strong> A1-1 RF Shelf</td>
</tr>
<tr>
<td><strong>4</strong> A1-2 RF Shelf</td>
</tr>
<tr>
<td><strong>5</strong> A1-1 Warm Load</td>
</tr>
<tr>
<td><strong>6</strong> A1-2 Warm Load</td>
</tr>
<tr>
<td><strong>7</strong> Ant A1-1 Drive Motor Current</td>
</tr>
<tr>
<td><strong>8</strong> Ant A1-2 Drive Motor Current</td>
</tr>
<tr>
<td><strong>9</strong> Signal Processing</td>
</tr>
</tbody>
</table>

**POWER [4]** ON

SELECT TOUCHSCREEN BUTTON 2
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>ANTENNA DRIVE</td>
<td>15VDC</td>
<td>15.00</td>
<td>19 L.O. VOLTAGE</td>
</tr>
<tr>
<td>11</td>
<td>SIGNAL PROCESSING</td>
<td>-15VDC</td>
<td>-15.00</td>
<td>20 L.O. VOLTAGE</td>
</tr>
<tr>
<td>12</td>
<td>ANTENNA DRIVE</td>
<td>-15VDC</td>
<td>-14.92</td>
<td>21 L.O. VOLTAGE</td>
</tr>
<tr>
<td>13</td>
<td>RECEIVER AMPLIFIER</td>
<td>8VDC</td>
<td>8.09</td>
<td>22 L.O. VOLTAGE</td>
</tr>
<tr>
<td>14</td>
<td>SIGNAL PROCESSOR</td>
<td>5 VDC</td>
<td>5.07</td>
<td>23 L.O. VOLTAGE</td>
</tr>
<tr>
<td>15</td>
<td>ANTENNA DRIVE</td>
<td>5 VDC</td>
<td>5.06</td>
<td>24 L.O. VOLTAGE</td>
</tr>
<tr>
<td>16</td>
<td>RECEIVER MIXER/IF</td>
<td>10VDC</td>
<td>10.03</td>
<td>25 PLLO # 2 LOCK DETECT</td>
</tr>
<tr>
<td>17</td>
<td>PHASE LOCK LOOP CH9/14</td>
<td>15VDC</td>
<td>14.99</td>
<td>26 PLLO # 1 LOCK DETECT</td>
</tr>
<tr>
<td>18</td>
<td>PHASE LOCK LOOP CH9/14</td>
<td>-15VDC</td>
<td>-14.85</td>
<td>27 L.O. VOLTAGE</td>
</tr>
</tbody>
</table>

[ 21 ] UP
[ 22 ] DOWN

POWER [ 4 ] ON
SELECT TOUCHSCREEN BUTTON 2
## Integrate/Hold and Dump Signal Verification (Paragraph 3.2.4.3.6.1)

### ATTACH PHOTOGRAPH OR PLOT HERE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope Channel-1: Integration/Hold</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Measured (A)*</td>
<td>165 ms</td>
<td>165 ms ± 10%</td>
<td>P</td>
</tr>
<tr>
<td>Time Measured (B)*</td>
<td>35 ms</td>
<td>35 ms ± 10%</td>
<td>P</td>
</tr>
<tr>
<td>Amplitude Measured</td>
<td>5.0 V</td>
<td>5.0 ± 0.2 V</td>
<td>P</td>
</tr>
<tr>
<td><strong>Scope Channel-2: Dump Signal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Measured (D)*</td>
<td>12.5 ms</td>
<td>9 ms to 15 ms</td>
<td>P</td>
</tr>
<tr>
<td>Amplitude Measured</td>
<td>5.0 V</td>
<td>5.0 ± 0.2 V</td>
<td>P</td>
</tr>
</tbody>
</table>

* Refer to Figure 2 for waveform configuration.

Circle Test: \(\boxed{\text{CPT}}\) LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: 37323

Test Systems Engineer: 3/11/99  Date: 3/11/99

Customer Representative (Flight Hardware Only):

Date: MAR 17 1999  Quality Control: 3/11/99  Date: 3/11/99
# TEST DATA SHEET 37
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>INTEGRATION (X)*</th>
<th>Measured</th>
<th>Required 165 ms ± 10%</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>50.3 GHz</td>
<td>Measured 165 ms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOLD (B-D)</th>
<th>Measured 25 ms</th>
<th>Required 25 ms ± 10%</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DUMP (D)</th>
<th>Measured 12.5 ms</th>
<th>Required 9 ms to 15 ms</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>INTEGRATION (X)*</th>
<th>Measured</th>
<th>Required 165 ms ± 10%</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>52.8 GHz</td>
<td>Measured 165 ms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOLD (B-D)</th>
<th>Measured 25 ms</th>
<th>Required 25 ms ± 10%</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DUMP (D)</th>
<th>Measured 12.5 ms</th>
<th>Required 9 ms to 15 ms</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 2 for waveform configuration.

Circle Test: [ ] CPT [ ] LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234, SN: 105

Test Systems Engineer: [Signature] 3/16/99

Customer Representative (Flight Hardware Only) Date: [Signature] 3/16/99

Quality Control Date: [Signature] 2/14/99

A-54
ATTACH PHOTOGRAPH OR PLOT HERE

Channel 05
Frequency: 53.596 GHz

INTEGRATION (X) *
Measured 65 ms
Required 165 ms ± 10%
Pass/Fail 

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail 

DUMP (D) *
Measured 25 ms
Required 9 ms to 15 ms
Pass/Fail 

Channel 06
Frequency: 54.4 GHz

INTEGRATION (X) *
Measured 63 ms
Required 165 ms ± 10%
Pass/Fail 

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail 

DUMP (D) *
Measured 25 ms
Required 9 ms to 15 ms
Pass/Fail 

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 328324 S/N: 105

Test Systems Engineer: ___________________________ Date: ________________

Customer Representative (Flight Hardware Only) Date: ________________

Quality Control Date: ________________
TEST DATA SHEET 39
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 07
Frequency: 54.94 GHz

INTEGRATION (X) *
Measured 165 ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured 125 ms
Required 9 ms to 45 ms
Pass/Fail

Channel 08
Frequency: 55.5 GHz

INTEGRATION (X) *
Measured 165 ms
 Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measure 125 ms
Required 9 ms to 45 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720
Shop Order: 575234
S/N: 103
K. Hair 5/16/98
Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date

A-56
TEST DATA SHEET 40
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 09
Frequency: 57.2903 GHz

INTEGRATION (X) *
Measured 165 ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured 12.5 ms
Required 9 ms to 15 ms
Pass/Fail

Channel 10
Frequency: 57.2903 GHz

INTEGRATION (X) *
Measured 165 ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured 12.5 ms
Required 9 ms to 15 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 105

Test Systems Engineer

Customer Representative (Flight Hardware Only) Date

Quality Control Date
# TEST DATA SHEET 41
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>INTEGRATION (X)</th>
<th>HOLD (B-D)</th>
<th>DUMP (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>57.3903 GHz</td>
<td>Measured 165 ms, 10% Pass/Fail</td>
<td>Measured 25 ms, 10% Pass/Fail</td>
<td>Measured 9 ms to 15 ms Pass/Fail</td>
</tr>
<tr>
<td>12</td>
<td>57.3903 GHz</td>
<td>Measured 165 ms, 10% Pass/Fail</td>
<td>Measured 25 ms, 10% Pass/Fail</td>
<td>Measured 9 ms to 15 ms Pass/Fail</td>
</tr>
</tbody>
</table>

* Refer to Figure 2 for waveform configuration.

Circle Test: [CPT] LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373234 S/N: 105

Test Systems Engineer

Customer Representative (Flight Hardware Only)

Quality Control

A-58
TEST DATA SHEET 42
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 13
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 165 ms
Required 165 ms \± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms \± 10%
Pass/Fail

DUMP (D) *
Measured 12.5 ms
Required 9 ms to 15 ms
Pass/Fail

Channel 14
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 165 ms
Required 165 ms \± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms \± 10%
Pass/Fail

DUMP (D) *
Measured 12.5 ms
Required 9 ms to 15 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N 131720 Shop Order: 379274 S/N 103

Test Systems Engineer: R. Har 3/16/99 Date: 3/16/99

Customer Representative (Flight Hardware Only)

Date: MAR 7 1999

Quality Control Date: 2/16/99

A-59
Tek Stop: 2kS/s
5 Acqs

Δ: 12.5ms
@: -165.5ms

Cursor Function

Off

H Bars

V Bars

Paired

Ch1: Math 2 V 4 dB 50 Hz
Ch2: 1 V M 25ms Ch1 J 1.56 V

Function V Bars

Time Units Seconds
TEST DATA SHEET 43
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 15
Frequency: 89 GHz

INTEGRATION (X) *
Measured 16 ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured 25 ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured 125 ms
Required 9 ms to 15 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT
LPT
METSAT/AMSU-A1 System P/N IS-1331720
Shop Order: 373234
S/N: 105

Test Systems Engineer: 3/6/89
Quality Control: 2/11/89

Customer Representative
(Flight Hardware Only)

Date

MAR 17 1999

A-60
Tek Stop: 2kS/s

5 Acqs

Δ: 12.5ms
@: -165.5ms

Cursor Function

Off

H Bars

V Bars

Paired

Ch1 Math 2 V 4 dB Ch2 1 V M 25ms Ch1 1.56 V
TEST DATA SHEET 44
PLLO No. 1 Verification (Paragraph 3.2.4.3.6.3)
PLLO No. 2 Verification (Paragraph 3.2.4.3.6.4)

<table>
<thead>
<tr>
<th>PLLO NO. 1</th>
<th>PLLO NO. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLLO No. 1 dc Level</strong></td>
<td><strong>PLLO No. 2 dc Level</strong></td>
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<tr>
<td>4.38 V</td>
<td>4.38 V</td>
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<tr>
<td>Required: *</td>
<td>Required: *</td>
</tr>
<tr>
<td>Pass/Fail P</td>
<td>Pass/Fail P</td>
</tr>
</tbody>
</table>

* -15 to +15 V dc level for S/N 101 - S/N 104, 4.0 ± 1.0 V for S/N 105 and above.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

SN: 105

R. Hail 3/6/99

Test Systems Engineer

Mar 1 7 1999

Customer Representative (Flight Hardware Only)

Date

Quality Control

Date
<p>| | | | | | |</p>
<table>
<thead>
<tr>
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<tbody>
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<td>15VDC</td>
<td>15.34</td>
<td>19</td>
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<tr>
<td>11</td>
<td>SIGNAL PROCESSING</td>
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<td>-15.00</td>
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<tr>
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<tr>
<td>14</td>
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<td>5.07</td>
<td>23</td>
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</tr>
<tr>
<td>15</td>
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<td>5 VDC</td>
<td>5.21</td>
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<tr>
<td>16</td>
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<td>10.03</td>
<td>25</td>
<td>PLLO # 2 LOCK DETECT</td>
</tr>
<tr>
<td>17</td>
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<td>14.99</td>
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<td>18</td>
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<td>-15VDC</td>
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POWER [ 4 ] ON
SELECT TOUCHSCREEN BUTTON 2

TDS 44
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<thead>
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<th>No.</th>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
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<td>CH 4</td>
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POWER [ 4 ] ON

SELECT TOUCHSCREEN BUTTON 2

TDS 44
### TEST DATA SHEET 49

**Receiver Input Signals (Paragraph 3.2.4.4.1)**

<table>
<thead>
<tr>
<th>CH 9 through 14 PLLO</th>
<th>PRT Temp (°C)</th>
<th>Measured Frequency</th>
<th>Requirements **</th>
<th>Pass/Fail</th>
</tr>
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<tbody>
<tr>
<td>PLLO No. 1 PLO No. 1</td>
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<td>57290.334 MHz</td>
<td>57290.334 MHz ± 50 kHz</td>
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</tr>
</tbody>
</table>

* Attach spectrum analyzer plots.

** = At 18°C

*** PRT not connected on S/N 105 and above.

---

Circle Test: ☐ LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373234

S/N: 105

Date: 3/16/99

Test Systems Engineer: [Signature]

Date: 3/16/99

Customer Representative (Flight Hardware Only)

Date: MAR 17 1999

Quality Control

Date: [Signature] 3/16/99

---

A-68
CL 30.0 dB
RL -33.2 dBm 10 dB/ 57.2903440 GHz
MKR -83.03 dBm
MKR 57.2903440 GHz
-83.03 dBm

CENTER 57.2903440 GHz
SPAN 500.0 kHz
*RBW 10 kHz
*VBW 10 kHz
*SWP 1.00 sec
## TEST DATA SHEET 50 (Sheet 1 of 2)
Radiometer “Relative” NEAT Verification* (Paragraph 3.2.4.4.2.2)

<table>
<thead>
<tr>
<th>Channel Number</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>NEAT (Average of 5 data)</td>
<td>0.23</td>
<td>0.14</td>
<td>0.15</td>
<td>0.15</td>
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<tr>
<td>Pass/Fail</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>NEAT (Specified) K **</td>
<td>0.40</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Channel Number</td>
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<td>9</td>
<td>10</td>
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<tr>
<td>NEAT (Average of 5 data)</td>
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<td>0.17</td>
<td>0.17</td>
<td>0.21</td>
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<tr>
<td>Pass/Fail</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
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<tr>
<td>NEAT (Specified) K **</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>Channel Number</td>
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<td>13</td>
<td>14</td>
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<tr>
<td>NEAT (Average of 5 data)</td>
<td>0.23</td>
<td>0.24</td>
<td>0.40</td>
<td>0.76</td>
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<tr>
<td>Pass/Fail</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
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<td>NEAT (Specified) K **</td>
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<td></td>
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<tr>
<td>NEAT (Average of 5 data)</td>
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<tr>
<td>Pass/Fail</td>
<td>P</td>
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<td>NEAT (Specified) K **</td>
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</table>

* Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria
** For reference only

Circle Test: **CPT**  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: 373224  S/N: 105

Test Systems Engineer: 3/14/99  Date

Customer Representative (Flight Hardware Only)  Date: 3/14/99

Quality Control  Date: 3/14/99
<table>
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<th>COLD COUNTS</th>
<th>GAIN</th>
<th>DELTA T</th>
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<tbody>
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<td>13411.0</td>
<td>0.078</td>
<td>0.234</td>
</tr>
<tr>
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<td>16636.0</td>
<td>13713.0</td>
<td>0.074</td>
<td>0.150</td>
</tr>
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<td>5</td>
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<td>14189.0</td>
<td>0.076</td>
<td>0.143</td>
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<td>0.161</td>
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[5] PRINT DISTRIBUTION GRAPH
SELECT TOUCHSCREEN BUTTON 2

RETURN [1]

TPS 50
10FZ
PLOT#1
### A1 Functional Test Results

**16-MAR-99**

<table>
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<tr>
<th>CH</th>
<th>Warm Temp</th>
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<th>Cold Counts</th>
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<th>Delta T</th>
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[5] Print Distribution Graph  RETURN [1]

Select Touchscreen Button 2
### A1 FUNCTIONAL TEST RESULTS

#### 16-MAR-99

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<th>WARM TEMP</th>
<th>WARM COUNTS</th>
<th>COLD COUNTS</th>
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</table>


[ 5 ] PRINT DISTRIBUTION GRAPH

SELECT TOUCHSCREEN BUTTON 2
### A1 FUNCTIONAL TEST RESULTS

**A1.EXE:62**  
**16-MAR-99**  
**10:37:45**

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<th>COLD COUNTS</th>
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<th>DELTA T</th>
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[ 2 ] PRINT SCREEN  
[ 3 ] PRINT RAW DATA  
[ 4 ] PRINT HISTOGRAM  
[ 5 ] PRINT DISTRIBUTION GRAPH  
RETURN [ 1 ]

SELECT TOUCHSCREEN BUTTON 2
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* Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria

** For reference only

---

Circle Test: [CPT]  [LPT]

**METSAT/AMSU-A1 System P/N IS-1331720**  **Shop Order:** 373234  **S/N:** (0)  **Test Systems Engineer:** [Signature]  **Date:** 3/16/99

Customer Representative  **(Flight Hardware Only):**  **Date:** 3/17/99

Quality Control  **Date:** 3/14/99
### A1 FUNCTIONAL TEST RESULTS

**A1.EXE;62**  
16-MAR-99  
10:52:01

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[ 2 ] PRINT SCREEN  
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[ 4 ] PRINT HISTOGRAM

[ 5 ] PRINT DISTRIBUTION GRAPH

SELECT TOUCHSCREEN BUTTON 2

RETURN [ 1 ]

**TDS 50**
**SHEETS 20F2**
**PLOT#2**
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SELECT TOUCHSCREEN BUTTON 2
### A1 FUNCTIONAL TEST RESULTS

**A1.EXE; 62**

**16-MAR-99**

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SELECT TOUCHSCREEN BUTTON 2
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[ 5 ] PRINT DISTRIBUTION GRAPH

SELECT TOUCHSCREEN BUTTON 2

RETURN [ 1 ]
SPECIAL TEST DATA
### Instrument Feedback Tests

#### 3.2.4.2.2.8: +28V Pulse Load Bus Instrument Feedback Tests

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#### 3.2.4.2.3.2: +28V Analog Telemetry Bus Instrument Feedback Tests

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#### 3.2.4.2.4.2: +10V Interface Bus Instrument Feedback Tests

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**OPERATION 0850 - C**

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 3732.34, S/N: 105 3-17-99

Test Systems Engineer: Dale Wallace 3-17-99

Customer Representative (Flight Hardware Only): 3-17-99

Quality Control: 3-17-99
Tek Stop: 1kS/s

11 Acqs

Δ: 8.5mV
@: 5.6mV

1 mV / 10 mV

17 Mar 1999
15:13:40

Model: 373234
MN: 1331720-2
SN: 105

OPERATION 0850-C

Test Eng. Signature

Quality Signature

Date: 3-17-99
PROCESS SPECIFICATION

METSAT/KLM/AMSU-A1, SYSTEM COMPREHENSIVE AND LIMITED PERFORMANCE TESTS

TEST PROCEDURE

Contract No.: NAS5-32314

Prepared for:

NASA/Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771
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**Digital-A/GSE Mode-1 Temperature Sensors Section [VI]**

**Receiver Input Signals**

**Radiometer "Relative" NEDT Verification**

**Transient Susceptibility Test**

**Instrument Feedback Tests**

**Channel Identification Test**
1. SCOPE

1.1 Scope. This specification establishes the requirements for the Comprehensive Performance Test (CPT) and Limited Performance Test (LPT) of the Advanced Microwave Sounding Unit-A1 (AMSU-A1), referred to herein as the unit. The unit is defined on Drawing 1331720.

1.2 Test procedure sequence. The sequence in which the several phases of this test procedure shall take place is shown in Figure 1, but the sequence can be in any order.
2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents form a part of this specification to the extent specified. Unless otherwise specified, the issue shown shall apply.

STANDARDS

Military

MIL-STD-45662 Calibration Systems Requirements

OTHER DOCUMENTS

S-480-79 Performance Assurance Requirements for the EOS/METSAT Integrated Programs Advanced Microwave Sounding Unit-A (AMSU-A) (PAR)

S-480-80 Performance and Operation Specification for the EOS/METSAT Integrated Programs Advanced Microwave Sounding Unit-A (AMSU-A) (POS)

IS-2617547 AMSU-A1 Unique Instrument Interface Specification (UIIS)

IS-3267415 ATN-KLM General Instrument Interface Specification (GIIS)

(Copies of government documents should be obtained as indicated in the Department of Defense Index of Specification and Standards.)

2.2 Non-Government documents. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue in effect on the date of testing shall apply.

2.2.1 Aerojet documents

SPECIFICATION

AE-26002/1 Test Procedure, Subsystem, Antenna Drive for AMSU-A1

AE-26157 Special Test Equipment (STE), Operation and Maintenance Manual

AE-26357 Transportation Handling Procedure for the AMSU-A System Integrated Program

STANDARD

STD-2454 Requirements for Electrostatic Discharge Control

REPORT

10353 Contamination Control Plan for the Advanced Microwave Sounding Unit-A (AMSU-A)
DRAWINGS

1331720 Advanced Microwave Sounding Unit A1 (AMSU-A1)
1335695 Special Test Equipment
1356655 Console Assembly, METSAT and EOS STE

(Copies of Aerojet documents may be obtained from Gencorp Aerojet, Azusa Operations, CAGE 70143, P.O. Box 296, Azusa, California, 91702-0296).
3. REQUIREMENTS

3.1 General test requirements

3.1.1 Equipment and test facilities. The tests described herein shall be performed at Aerojet under laboratory conditions in an EMI shielded chamber for the first and final CPT. Other tests need not be accomplished in the EMI shielded chamber. The test equipment listed in Table I shall be used when performing the tests. If the specified equipment is not available, the equipment substituted shall provide a measurement accuracy equal to or greater than that of the specified equipment. The AMSU-A Special Test Equipment (STE) shall be used for activation and control of the unit and monitoring of its performance.

Table I. Equipment List

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Item Description</th>
<th>Mfg.</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Dynamic signal analyzer</td>
<td>Hewlett-Packard</td>
<td>3562A</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Signal Generator</td>
<td>Hewlett-Packard</td>
<td>3314A</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Oscilloscope</td>
<td>Tektronix</td>
<td>2225A</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>9-pin breakout box</td>
<td>Aerojet</td>
<td>2536-3743/SK1358702-1</td>
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<tr>
<td>5</td>
<td>1</td>
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<td>Aerojet</td>
<td>2536-3744/SK1358703-1</td>
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<td>25-pin breakout box</td>
<td>Aerojet</td>
<td>2536-3746/SK1358704-1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>37-pin breakout box</td>
<td>Aerojet</td>
<td>2536-3745/SK1358705-1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Relay Board</td>
<td>Aerojet</td>
<td>-</td>
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<td>9</td>
<td>1</td>
<td>Double Shielded Connector</td>
<td>-</td>
<td>-</td>
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<tr>
<td>10</td>
<td>1</td>
<td>Lab. General Purpose Power Supply</td>
<td>Hewlett-Packard</td>
<td>6114</td>
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<td>11</td>
<td>1</td>
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<td>Tektronix</td>
<td>466A</td>
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<td>12</td>
<td>1</td>
<td>Power Supply</td>
<td>Power Designs</td>
<td>3650-S</td>
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<tr>
<td>13</td>
<td>1</td>
<td>WR19 Harmonic Mixer (40-60 GHz)</td>
<td>Hewlett-Packard</td>
<td>HP11970V</td>
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<tr>
<td>14</td>
<td>1</td>
<td>Power Meter</td>
<td>Anritsu</td>
<td>ML83A</td>
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<tr>
<td>15</td>
<td>1</td>
<td>WR19 Feed Horn</td>
<td>TRG</td>
<td>V861</td>
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<td>16</td>
<td>1</td>
<td>LN2 Container</td>
<td>Cole</td>
<td>N03726-20</td>
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<td>17</td>
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<td>Hewlett-Packard</td>
<td>8566B</td>
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<tr>
<td>18</td>
<td>1</td>
<td>STE Computer</td>
<td>Aerojet</td>
<td>1336695</td>
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<td>19</td>
<td>1</td>
<td>STE Interface Cable J1</td>
<td>Aerojet</td>
<td>1335758-1</td>
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<tr>
<td>20</td>
<td>1</td>
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<td>Aerojet</td>
<td>1335752-1</td>
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<tr>
<td>21</td>
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<td>1335756-1</td>
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<td>Aerojet</td>
<td>1335755-1</td>
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<td>1</td>
<td>STE Interface Cable J5</td>
<td>Aerojet</td>
<td>1335753-1</td>
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<td>24</td>
<td>1</td>
<td>STE Interface Cable J6</td>
<td>Aerojet</td>
<td>1335754-1</td>
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<tr>
<td>25</td>
<td>1</td>
<td>STE Interface Cable J7</td>
<td>Aerojet</td>
<td>1335757-1</td>
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<tr>
<td>26</td>
<td>1</td>
<td>Oscilloscope Camera</td>
<td>Tektronix</td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>Current Probe</td>
<td>Tektronix</td>
<td>AM503</td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>Plotter</td>
<td>Hewlett-Packard</td>
<td>7475A</td>
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<tr>
<td>29</td>
<td>1</td>
<td>Frequency Counter</td>
<td>Hewlett-Packard</td>
<td>5316A</td>
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<tr>
<td>30</td>
<td>1</td>
<td>Multimeter (Digital volt-ohm meter)</td>
<td>Fluke</td>
<td>77</td>
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Table I. Equipment List (Continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Item Description</th>
<th>Mfg.</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>31</td>
<td>1</td>
<td>Cold Target Stand A1-1</td>
<td>Aerojet</td>
<td>T-1291001-3</td>
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<td>32</td>
<td>1</td>
<td>Cold Target Stand A1-2</td>
<td>Aerojet</td>
<td>T-1291001-2</td>
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<td>Cold Target Support</td>
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<td>T-1291000-1</td>
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<td>1</td>
<td>Sweeper</td>
<td>Hewlett-Packard</td>
<td>83623A</td>
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<td>35</td>
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<td>Multiplier</td>
<td>Hewlett-Packard</td>
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<td>36</td>
<td>1</td>
<td>Coupler/Detector</td>
<td>Hewlett-Packard</td>
<td>83557-60001</td>
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<tr>
<td>37</td>
<td>1</td>
<td>Spectrum Analyzer</td>
<td>Hewlett-Packard</td>
<td>8563E</td>
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</tbody>
</table>

3.1.2 Required procedures and operations. The unit shall be subjected to the examinations and tests specified in 3.2.4 and Table II.

3.1.2.1 Limited performance test (LPT). The Limited Performance Test shall consist of the test procedures specified in the LPT column of Table II.

3.1.2.2 Comprehensive performance test (CPT). Three versions of the Comprehensive Performance Test are identified in Table II. These are applicable for different test stages. The test procedures to be performed for each version are specified in the 1st CPT, Sub CPT, and Final CPT columns of Table II. See 3.1.1 for required location of the first and the final CPT.

3.1.3 Inspection instructions. The following shall apply to all inspections performed under this specification.

a. Personnel familiarization: All personnel directly concerned with the conduct of the inspection shall become familiar with the entire content of this document before beginning the tests. Each step, including all notes, warnings, and cautions, shall be understood thoroughly before starting.

b. Referenced documents: Performance of the tests specified herein may require reference to the documents listed in Section 2. It is recommended that the applicable issues of these documents be available at the time and place of testing.

3.1.4 Test conditions. The following paragraphs shall apply to all testing described in this document.

3.1.4.1 Standard ambient conditions. Unless otherwise specified in a detailed method paragraph, all handling shall be performed under the following laboratory ambient conditions.

a. Handling in accordance with AE-26357

b. Contamination control in accordance with Report 10353

c. Temperature: \(+23 \pm 10^\circ C\)

d. Pressure: 610 to 810 torr

e. Humidity: 50 \(\pm 20\%\) (no condensation)

f. The instrument shall be placed in its protective bag (1338427) when not in use.
### Table II. AMSU-A1 Performance Tests

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Test Description</th>
<th>1st CPT</th>
<th>LPT</th>
<th>Sub CPT</th>
<th>Final CPT</th>
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<tbody>
<tr>
<td>3.2.4.1</td>
<td>Grounding</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>3.2.4.2.1.1</td>
<td>+28 Main Load Bus (MLB) Turn-On Transient</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>3.2.4.2.1.2</td>
<td>+28 MLB Operating Power</td>
<td>X</td>
<td>Note 2</td>
<td>Note 3</td>
<td>X</td>
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<tr>
<td>3.2.4.2.1.3</td>
<td>Instrument Feedback Test</td>
<td>X</td>
<td></td>
<td></td>
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<td>Transient Susceptibility Test</td>
<td>X</td>
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<td>3.2.4.2.2</td>
<td>+28 Pulse Load Bus (PLB) Peak Current</td>
<td>X</td>
<td>Note 4</td>
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<tr>
<td>3.2.4.2.2.8</td>
<td>Instrument Feedback Test (PLB)</td>
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<tr>
<td>3.2.4.2.2.9</td>
<td>Transient Susceptibility Test</td>
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<tr>
<td>3.2.4.2.3</td>
<td>+28 Analog Telemetry Bus (ATB)</td>
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<tr>
<td>3.2.4.2.3.2</td>
<td>Instrument Feedback Test (ATB)</td>
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<tr>
<td>3.2.4.2.3.3</td>
<td>Transient Susceptibility Test</td>
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<tr>
<td>3.2.4.2.4</td>
<td>+10 V Interface Bus</td>
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<td>X</td>
<td>X</td>
<td></td>
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<tr>
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<td>3.2.4.2.5</td>
<td>Power Input Test for LPT</td>
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<td></td>
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<td>Clock Signals</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.3.3</td>
<td>Commands and Digital-B Telemetry</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>3.2.4.3.4</td>
<td>Digital-A Data Output</td>
<td>X</td>
<td>Note 5</td>
<td>Note 5</td>
<td>X</td>
</tr>
<tr>
<td>3.2.4.3.5</td>
<td>Analog Telemetry</td>
<td>X</td>
<td>Note 6</td>
<td>Note 6</td>
<td>X</td>
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<tr>
<td>3.2.4.3.6</td>
<td>Test Points</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>3.2.4.3.7</td>
<td>GSE Mode</td>
<td>X</td>
<td>Note 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. Test Data Sheets for CPT/LPT located in Appendix A.
2. 3.2.4.2.5 (Power input test for LPT).
3. At 28 V only.
4. 3.2.4.2.2 except 3.2.4.2.2.6.
5. Only full scan.
6. STE only.
7. GSE mode test/verification is not required and is for engineering use only.

#### 3.1.4.2 Test tolerances.**  
The tolerances allowed on test conditions are intended only to provide for accuracy of such items as instrumentation and controls. Conditions shall be as close as possible to the nominal or center values specified, and in no instance shall they exceed the tolerances specified. Unless otherwise specified, the tolerances shall be within ± 10%.

#### 3.1.4.3 Read-out accuracy.  
Parameters are specified either as limits or as nominal values with plus-or-minus tolerances. These limits and tolerances shall be regarded as absolute, and the inaccuracies of measuring equipment shall not be interpreted as part of measured values in such a way that out-of-limit measurements may appear in-limit.
3.1.5 **Electrostatic Sensitive Device (ESD) handling.** All electronic hardware shall be handled in accordance with Aerojet Standard STD-2454.

### 3.2 Detailed Procedures

#### 3.2.1 Responsibility for inspection. All tests specified herein shall be performed under the cognizance of Aerojet Quality Assurance.

#### 3.2.2 Monitoring procedures for equipment. Test equipment calibration schedules and procedures shall comply with the requirements of MIL-STD-45662. Before performing examinations and tests in accordance with this procedure, all test equipment to be used shall be verified as being within their current calibration period. Calibration or alignment, necessary for operation of the equipment within the requirements of this document, shall be performed when required.

#### 3.2.3 Test preparation

**3.2.3.1 STE connection.** The power sources, signal sources, and loads are provided to the unit under test by the AMSU-A Special Test Equipment (STE) (Drawing 1355695 or 1356655), in accordance with paragraph 5.2 of S-480-80. The STE is automated test equipment controlled by a MicroVax computer. The unit shall be connected to the STE in accordance with AE-26157 and the detailed test procedures in 3.2.4.

**3.2.3.2 Signal sources.** Signal sources required during the performance test but not provided by the STE are as follows:

a. Cold background at LN₂ temperature at room ambient.

b. +28 ± 1 Vdc, 3 Amps.

**3.2.3.3 Signal outputs.** Signal outputs, except for the test signals at J7, shall be monitored by the STE. The signal outputs at J7 are shown in Figure 2.

**3.2.3.4 Test software.** AMSU-A1 bonded software shall be used to operate the STE. During initialization of the STE, as specified in AE-26157, the A1 software shall be selected. The bonded software is being selected by the STE computer automatically during initialization of the STE.

**3.2.3.5 Initial turn-on.** When called for in the individual test procedures, turn on the unit as follows:

1. Turn on the STE and initialize the STE as specified in AE-26157.
2. Connect breakout box to J1 on the STE +28 V power supply cable J1.
3. Connect DVM to J1-1 (+) and J1-3 (RTN).
4. Verify that the STE power supply POWER switch on the STE +28 V power supply is ON and the power supply is adjusted to +28 ±0.5 Vdc.
5. Verify that the PWR and SW/TM switches on the STE power distribution unit are ON.
6. Enter the serial number (decimal equivalent of the identification number provided in the UIIS) for the unit under test using AE-26157, if necessary. Verify that the Main Menu (AMSU-A1 WHAT TYPE OF TEST?) is displayed on the STE CRT terminal display.
7. On the Main Menu, press the [2] MONITOR ONLY touch area (or type the number). The Monitor Only Menu will be displayed, with Block Monitor Data Select options shown in the middle (window) area of the screen.

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3.1.5 Electrostatic Sensitive Device (ESD) handling. All electronic hardware shall be handled in accordance with Aerojet Standard STD-2454.

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3.2.3.5 Initial turn-on. When called for in the individual test procedures, turn on the unit as follows:

1. Turn on the STE and initialize the STE as specified in AE-26157.
2. Connect breakout box to J1 on the STE +28 V power supply cable J1.
3. Connect DVM to J1-1 (+) and J1-3 (RTN).
4. Verify that the STE power supply POWER switch on the STE +28 V power supply is ON and the power supply is adjusted to +28 ±0.5 Vdc.
5. Verify that the PWR and SW/TM switches on the STE power distribution unit are ON.
6. Enter the serial number (decimal equivalent of the identification number provided in the UIIS) for the unit under test using AE-26157, if necessary. Verify that the Main Menu (AMSU-A1 WHAT TYPE OF TEST?) is displayed on the STE CRT terminal display.
7. On the Main Menu, press the [2] MONITOR ONLY touch area (or type the number). The Monitor Only Menu will be displayed, with Block Monitor Data Select options shown in the middle (window) area of the screen.
NOTE: Timing Tolerances are ±10%.

Figure 2. Signal Output at J7


10. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMANDS</th>
<th>CONNECT</th>
<th>ANTEenna IN COLD CAL POS =</th>
<th>NO [15]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER =</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR =</td>
<td>OFF</td>
<td></td>
<td>NO [16]</td>
</tr>
<tr>
<td>[11] MODULE TOTALLY OFF =</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER =</td>
<td>ON</td>
<td></td>
<td>PLL POWER =</td>
</tr>
<tr>
<td>[14] ANTEenna WARM CAL POS =</td>
<td>NO</td>
<td>COLD CAL POSITION LSB =</td>
<td>ZERO [20]</td>
</tr>
</tbody>
</table>

11. Wait at least 18 seconds and observe the commands are acknowledged by STE.
12. Verify that the STE power supply is adjusted to +28 ±0.5 Vdc (see steps 2 through 4).

13. Verify that all breakout box switches are in the closed position.

14. According to the individual test procedures, execute commands as necessary to obtain the required commands configuration. Several commands can be executed at the same time.

3.2.3.6 Turn-off methods. The unit can be turned off immediately by pressing [9] MODULE POWER = DISCONNECT on the Commands Menu. For a phased shutdown, press [11] MODULE TOTALLY OFF = OFF on the Commands Menu or press POWER (4) OFF on any display. When connecting breakout boxes to the unit or STE connectors, verify that the unit power is off and the STE +28 V power supply is manually turned off.

NOTE

If power of the unit is turned off by command [9] MODULE POWER = DISCONNECT or the STE program is interrupted, then perform a phased shutdown after turn-on before starting next step.

3.2.4 Detailed performance tests. The comprehensive performance tests for the AMSU-A1 system are to be carried out on the fully assembled and operational unit. The tests to be performed are as follows:

a. Grounding/Isolation system test.

b. Power system test.

c. Clock commands and data system test.

d. Radiometer functional test.

e. Transient susceptibility test.

f. Instrument feedback test.

3.2.4.1 Grounding test. This test provides the verification of the unit grounding requirements of GIIS IS-3267415 Paragraph 3.1.1 and UIIS IS-2617547 paragraph 3.1.1.

1. Connect breakout boxes to each of the spacecraft interface connectors J1 through J7 as shown in Figure 3. Verify that all connectors are protected with connector savers.

2. Measure and record continuity or isolation between the points shown on Test Data Sheet (TDS) 1.
Figure 3. Grounding Test Setup

3.2.4.2 Power system, transient susceptibility, power quality, and instrument feedback tests. The purpose of these tests is to verify power system compliance in regard to:

a. Turn-On transients
b. Operating power
c. Transient susceptibility
d. Current ripple

The following DC voltage lines will be tested for the above parameters:

a. +28 V Main Load Bus (parameters a, b, c, d)
b. +28 V Pulse Load Bus (parameters a, b, c, d)
c. +28 V Analog Telemetry Bus (parameters b, c, d)
d. +10 V Interface Bus (parameters b, d)
4.2.1 +28 V main load bus test

3.2.4.2.1 +28 V MLB during turn on transient. The +28 V MLB (at 28.56 Vdc) during turn on, shall be verified as follows:

1. Configure the unit and test equipment as shown in Figure 4. Obtain DSA trigger from J4-14. Verify that switches 1, 2, 14 and 15 of the breakout box are in the OPEN position. Disconnect +28 Vdc external power supply output at J1 and adjust the power supply to read 28.56 ± 0.05 Vdc on voltmeter. Re-connect the power supply output (J1) as shown in Figure 4.

2. Configure the Dynamic Signal Analyzer (DSA) as follows:

<table>
<thead>
<tr>
<th>Select MEAS MODE</th>
<th>Select INPUT COUPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Time Capture</td>
<td>Select CH1 DC</td>
</tr>
<tr>
<td>Select Capture Select</td>
<td>Select CH1 Ground</td>
</tr>
<tr>
<td>Select Capture Length; Enter 300.0; Select msec</td>
<td>Select INPUT TRIG</td>
</tr>
<tr>
<td>Select FREQ</td>
<td>Select Trig Level; Enter 100; Select mV</td>
</tr>
<tr>
<td>Select E SMP Off</td>
<td>Select Arm AU</td>
</tr>
<tr>
<td>Select Freq Span; Enter 25; Select kHz</td>
<td>Select Ext; Select (-) Slope</td>
</tr>
<tr>
<td>Select SELECT MEAS</td>
<td>Select TRIG DELAY</td>
</tr>
<tr>
<td>Select Power Spec</td>
<td>Enter 0; Select μSec</td>
</tr>
<tr>
<td>Select CH1 Active</td>
<td>Select COORD</td>
</tr>
<tr>
<td>Select WINDOW</td>
<td>Select Real</td>
</tr>
<tr>
<td>Select Hann</td>
<td>Select VIEW INPUT</td>
</tr>
<tr>
<td>Select SOURCE</td>
<td>Select Time Buff</td>
</tr>
<tr>
<td>Select Source Off</td>
<td>Select SCALE</td>
</tr>
<tr>
<td>Select AVG</td>
<td>Select X Fixed Scale: Enter 0.0, 300; Select msec</td>
</tr>
<tr>
<td>Select Avg Off</td>
<td>Select Y Fixed Scale; Enter 0.80; Select mV</td>
</tr>
<tr>
<td>Select Tim Av Off</td>
<td>Select UNITS</td>
</tr>
<tr>
<td>Select RANGE</td>
<td>Select Hz (sec)</td>
</tr>
<tr>
<td>Select Chan 1 Range; Enter 1; Select V</td>
<td></td>
</tr>
</tbody>
</table>

NOTE

Prior to collecting any current data, the current meter and DSA have to be “zeroed out”; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 1.0 A/10mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetic benign location.

c) Adjust the “y” axis voltage range to ±4 mV.

d) Place the DSA in “Free Run” Trigger and depress “Start Capture” on the DSA.

e) With the “capture in process”, adjust the “output DC level” control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 4, and return the DSA to “Ext” trigger.
3. Turn the unit ON by selecting [9] MODULE POWER; set up the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, adjust the external power supply for 28 Vdc.


4. Turn the unit OFF by executing command [9] MODULE POWER. Confirm the command has been executed on the STE display.

5. Start the DSA signal capture by depressing “Start Capture”; wait for the DSA message “waiting for trigger” before proceeding.

6. On the STE computer, select [9] MODULE POWER and obtain a record of the +28 MLB Turn-On current waveform. On the STE computer, select [9] MODULE POWER to turn the instrument’s power OFF. Adjust the display time base and voltage sensitivity to allow for adequate current and pulse duration measurements (refer to Figure 5 or Figure 6 for an example of per division values). Plot the obtained waveform and attach a hard copy of the scan to TDS 2.

7. Measure the Turn-On time to reach steady state current; record this value on TDS 2.

8. Compute the peak current as follows:

   Measure the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 1.0 A/10 mV per division, and the maximum Y value = 46.8 mV:

   \[
   \text{46.8 mV} \times (1.0 \text{ A}/10 \text{ mV}) = 4.68 \text{ amps}
   \]

   Record this value on TDS 2.

9. The 1st derivative of the current waveform must be calculated. Compute the \(dI/dT\) as follows:

   The most probable location of the greatest current demand is during the first positive transition after voltage application. If this is the case, expand that segment of the display and measure the greatest voltage transition in the smallest time transition. The change in voltage times the current/div as selected on the current amplifier produces the change in current. Next divide this change in current by the change in time (in microseconds). This value is \(dI/dT\). Example:

   \[\begin{array}{l}
   \text{Change in voltage} \quad 35.29 \text{ mV} \\
   \text{Change in time (microseconds)} \quad 31.25 \mu s \\
   \text{Current/div on current amplifier} \quad 1000 \text{ mA}/10 \text{ mV}
   \end{array}\]

   \[
   \text{35.29 mV} \times (1000 \text{ mA}/10 \text{ mV})/31.25 \mu s = 112.9 \text{ mA}/\mu s
   \]

   Record the computed value on TDS 2.

10. With the multimeter, adjust the external power supply to 27.44 ±0.05 Vdc as measured between J1-1 (high) and J1-3 (low).
12. Repeat steps 3 through 10.

13. With the multimeter, adjust the external power supply to 28.00 ± 0.05 Vdc as measured between J1-1 (high) and J1-3 (low).

14. Repeat steps 3 through 10.

*NOTE: Current Probe's setting = 1.0 A/10 mV.

Figure 4. +28 V Main Load Bus Verification Setup
Figure 5. +28 V Main Bus Load Peak Power for KLM (S/N 102, 103 and 104)
Figure 6. +28 V Main Bus Load Peak Power for METSAT (S/N 105 and up)
e, and power as follows:

Verify that switches 1, 2, 14 and 15 of the external power supply are turned on. While monitoring voltmeter DSA trigger from J2-7. Select 20.0...
5 ENTER COMMAND [18] PLL POWER TO CHANGE FROM PLO #1 TO PLO #2 ACTIVE. ALLOW THE INSTRUMENT TO STABILIZE FOR A MINIMUM OF TWO MINUTES

6 RECORD THE OPERATING CURRENT ON TDS 3

7 COMPUTE THE OPERATING POWER (IN WATTS) AS EXPLAINED IN TDS 3

8 ENTER COMMAND [18] PLL POWER TO CHANGE FROM PLO #2 BACK TO PLO #1 ACTIVE. ALLOW THE INSTRUMENT TO STABILIZE FOR A MINIMUM OF TWO MINUTES

9-11

12 • Repeat of 5 through 8

13

14

15

16-18

19 Repeat of 5 through 8

20

21

22
2. Set up the DSA as follows:

Select MEAS MODE
Select Time Capture
Select Capture Select
Select Capture Length; Enter 1; Select Record
Select FREQ
Select Freq Span; Enter 100.0; Select Hz
Select E SMPL Off
Select Time Length; Enter 8.0; Select Sec
Select SELECT MEAS
Select Power Spec
Select CH1 Active
Select WINDOW
Select Hanning
Select SOURCE
Select Source Off
Select AVG
Select Avg Off
Select Tim Av Off
Select RANGE
Select Aut 1 Rng up

Select INPUT COUPLE
Select CH1 DC
Select CH1 Ground
Select SELECT TRIG
Select Trig Level; Enter 10; Select mV
Select Arm AU
Select Free Run
Select TRIG DELAY
Enter 0.0; Select Sec
Select COORD
Select Real
Select VIEW INPUT
Select Time Buff
Select SCALE
Select X Fixd Scale; Enter 0.0, 8.0; Select Sec
Select Y Fixd Scale; Enter -10.0, 70.0; Select mV
Select UNITS
Select Hz (sec)

3. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

4. Acquire 8 seconds of data on the DSA by depressing "Start Capture".

5. Turn OFF the "X" cursor, if it is ON. Turn the "X" cursor ON. The cursor will appear at the largest peak. Make a plot of this display.

6. Select the X-axis scale for 500 ms with the highest peak approximately in the center of the display. Turn the "Y" cursor ON and bound the limits of the current peaks. The delta Y value on the DSA will be used to calculate the peak-to-peak current. Make a plot of this display.

7. Compute the peak-to-peak current as follows:

Multiply the delta Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 2 mA/10 mV per division, and the delta Y value = 276 μV:

\[ 0.276 \text{ mV} \times (2 \text{ mA}/10 \text{ mV}) = 0.0552 \text{ mA} \]

Record this value on TDS 52.

3.2.4.2.1.4 Transient susceptibility and power quality tests. The power tests that follow will demonstrate the AMSU-A1 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines.

3.2.4.2.1.4.1 Equipment setup. Set up the test equipment and connect to the instrument as shown in Figure 7.

3.2.4.2.1.4.2 Low frequency load induced transients. The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the power line at the amplitude and duration specified in Figure 8. Perform the Low Frequency Load Induced Transients test as follows:

1. With the exception of the external power supply, turn ON all the test equipment.
Figure 7. +28 V MLB Transient Susceptibility and Power Quality Tests Setup
2. Place the signal generator in ARB 0 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 8.

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output from the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

8. Record any deviations in the functional performance of the AMSU instrument on TDS 51.
3.2.4.2.1.4.3 *High frequency load induced transients.* The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43</td>
<td>200 mVpp</td>
</tr>
<tr>
<td>2.86</td>
<td>1.00 Vpp</td>
</tr>
<tr>
<td>6.67</td>
<td>1.50 Vpp</td>
</tr>
</tbody>
</table>

Tolerance on the above values is ±10%.

Perform High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.
2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:
   
   - amplitude .............. 200 mVpp
   - offset .................. 0.000 V
   - frequency .............. 1.430 Hz
3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.
4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.
5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.
6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output from the power supply.
7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.
8. Repeat steps 2-4 and 6-7 for 2.86 Hz and 1.0 Vpp.
9. Repeat steps 2-4 and 6-7 for 6.67 Hz and 1.5 Vpp.
10. Record any deviations in the functional performance of the AMSU instrument on TDS 51.

3.2.4.2.2 +28 V pulse load bus test

3.2.4.2.2.1 *PLB during the first two seconds.* The PLB operation, during the first two seconds, shall be verified as follows:

1. Configure the unit and test equipment as indicated in Figure 9. Obtain DSA trigger from J2-7. Verify that switches 5, 6, 18 and 19 of the breakout box are in the OPEN position.
2. Disconnect +28 Vdc external power supply output and adjust the power supply to read 28.00 ± 0.05 Vdc by using DVM. Re-connect power supply output as shown in Figure 9.
3. Configure the dynamic signal analyzer as follows:

Select MEAS MODE
- Select *MEAS MODE*
- Select *Time Capture*
- Select *Capture Select*
- Select *Capture Length; Enter 1; Select Record*

Select FREQ
- Select *Freq Span; Enter 100; Select Hz*
- Select E SMPL Off
- Select *Time Length; Enter 8.0; Select Sec*

Select SELECT MEAS
- Select *Power Spec*
- Select CH1 Active

Select WINDOW
- Select Hann

Select SOURCE
- Select Source Off

Select AVG
- Select Avg Off
- Select Tim Av Off

Select RANGE
- Select Aut 1 Rng up

NOTE

Prior to collecting any current data, the current meter and DSA have to be "zeroed out"; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 200 mA/10mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetic benign location.

c) Adjust the "y" axis voltage range to ±4 mV.

d) Place the DSA in "Free Run" Trigger and depress "Start Capture" on the DSA.

e) With the "capture in process", adjust the "output DC level" control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 9, and return the DSA to "Ext" trigger.

The instrument is now ready to capture and plot 8 seconds of data.
Figure 9. +28 V Pulse Load Verification Setup
4. Adjust external power supply for +28 Vdc. Turn the unit ON by selecting [9] MODULE POWER, set up the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, re-adjust the external power supply for 28 Vdc.

<table>
<thead>
<tr>
<th>COMMANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT ANTEenna IN COLD CAL POS = NO</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF ANTEenna IN NADIR POS = NO</td>
</tr>
<tr>
<td>[11] MODULE TOTALLY OFF = ON ANTEenna FULL SCAN MODE = YES</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON PLL POWER = PLL0#1</td>
</tr>
<tr>
<td>[14] ANTEenna WARM CAL POS = NO COLD CAL POSITION LSB = ZERO</td>
</tr>
<tr>
<td>POWER [14] ON</td>
</tr>
</tbody>
</table>

5. Start the DSA signal capture by depressing “Start Capture”.

6. Obtain the first 2 second PLB current waveform by selecting 0 to 2 seconds time span. Refer to Figure 10 for a typical waveform. Turn OFF the “X” cursor if it is ON. Turn the “X” cursor ON. The cursor will appear at the highest peak. Ensure this value is less than or equal to 1.3 amps. Record value on TDS 4.

7. Compute the peak current as follows:
   Multiply the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 200 mA/10 mV per division, and the maximum Y value = 276 mV:

   \[ 60 \text{ mV} \times (200 \text{ mA}/10 \text{ mV}) = 1200 \text{ mA} = 1.20 \text{ amps} \]

3.2.4.2.2 PLB measured from 2 to 4 seconds. The PLB operation, from 2 to 4 seconds, shall be verified as follows:

1. Reset the dynamic analyzer in accordance with 3.2.4.2.2.1(2).

2. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 1.9 seconds.

3. Obtain a hard copy of the signal displayed on the dynamic signal analyzer (refer to Figure 10 for typical waveform).

4. From the hard copy obtained in step 3, calculate the peak current. Record the peak current and bus current values during the integrate/hold, dump (I/H, D) time period (refer to Figure 10) on TDS 4.

3.2.4.2.3 PLB measured from 4 to 6 seconds. The PLB operation, from 4 to 6 seconds, shall be verified as follows:

1. Reset the dynamic analyzer in accordance with 3.2.4.2.2.1(2).

2. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 3.9 seconds.

3. Obtain a hard copy of the signal displayed on the dynamic signal analyzer (refer to Figure 10 for typical waveform).

4. From the hard copy obtained in step 3, calculate the peak current. Record the peak current and bus current values during the integrate/hold, dump (I/H, D) time period (refer to Figure 10) on TDS 4.

3.2.4.2.4 PLB measured from 6 to 8 seconds. The PLB shall be measured as follows:

1. Reset the dynamic analyzer in accordance with 3.2.4.2.2.1(2).
2. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 5.9 seconds.

3. Obtain a hard copy of the signal displayed on the dynamic signal analyzer.

4. From the hard copy obtained in step 3, calculate the peak current. Record the peak current and bus current values during the integrate/hold, dump (I/H, D) time period (refer to Figure 10) on TDS 4.

3.2.4.2.2.5 Eight second integrated current measurement. To observe the PLB integrated (8 sec.) current waveform on the dynamic signal analyzer, configure the dynamic signal analyzer as follows:

Select SCALE
- Select X Fixd Scale; Enter 0.0, 8; Select Sec
- Select Y Fixd Scale; Enter -10, 70; Select mV

Select VIEW INPUT
- Select Time Record: Note – the display heading changes to read “Cap Tim Rec”

Select MATH
- Select Next
- Select Intgrt:
  - Note – the display changes to present an integrated value of the current waveform.

Select X (cursor)
- Move the X marker to the maximum right of the display. The Y value is indicative of the integrated current value over the entire 8 second period (in amp-sec).

Multiply the maximum Y value by the current/div as selected on the current amplifier, then divide by 8 seconds to acquire the average current value. As an example: if the current amplifier is set up to display 200 mA/10 mV per division, and the maximum Y value = 32.4 mV-sec:

\[
\frac{32.4 \text{ mV-sec} \times (200 \text{ mA/10 mV})}{8 \text{ sec}} = 81 \text{ mA}
\]

Enter the calculated integrated value on TDS 4.

3.2.4.2.6 PLB turn-on transient

1. Configure the unit and test equipment as shown in Figure 9. Obtain DSA trigger from J4-14. Verify that switches 5, 6, 18 and 19 of the breakout box are in the OPEN position.
2. Configure the Dynamic Signal Analyzer (DSA) as follows:

Select MEAS MODE
- Select Time Capture
- Select Capture Select
- Select Capture Length; Enter 500.0; Select msec

Select FREQ
- Select Freq Span; Enter 20; Select kHz
- Select E SMPL Off
- Select Time Length; Enter 32.0;

Select SELECT MEAS
- Select Power Spec
- Select CH1 Active

Select WINDOW
- Select Hann

Select SOURCE
- Select Source Off

Select AVG
- Select Avg Off
- Select Tim Av Off

Select RANGE
- Select Chan 1 Range; Enter 1; Select V

Select INPUT COUPLE
- Select CH1 DC
- Select CH1 Ground

Select INPUT TRIG
- Select Trig Level; Enter 1; Select V
- Select Arm AU
- Select External
- Select Ext; Select Slope(-)

Select TRIG DELAY
- Enter 0; Select μSec

Select COORD
- Select Real

Select VIEW INPUT
- Select Time Buff

Select SCALE
- Select X Fixd Scale: Enter 0.0, 25
- Select msec
- Select Y Fixd Scale; Enter -10, 470
- Select mV

Select UNITS
- Select Hz (sec)

NOTE

Prior to collecting any current data, the current meter and DSA have to be “zeroed out”; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 200 mA/10mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetic benign location.

c) Adjust the “y” axis voltage range to ±4 mV.

d) Place the DSA in “Free Run” Trigger and depress “Start Capture” on the DSA.

e) With the “capture in process”, adjust the “output DC level” control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 9, and return the DSA to “Ext” trigger.
3. Adjust external power supply for +28 Vdc. Turn the unit ON by selecting [9] MODULE POWER; set up the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, re-adjust the external power supply for 28 Vdc.

<table>
<thead>
<tr>
<th>COMMANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON</td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS = NO</td>
</tr>
</tbody>
</table>

POWER [4] ON

4. Turn the unit OFF by executing command [9] MODULE POWER. Confirm the command has been executed on the STE display.

5. Start the DSA signal capture by depressing “Start Capture”; wait for the DSA message “waiting for trigger” before proceeding.

6. On the STE computer, select [9] MODULE POWER and obtain a record of the +28 PLB Turn on current waveform. On the STE computer, select [9] MODULE POWER to turn the instrument’s power OFF. Adjust the display time base and voltage sensitivity to allow for adequate current and pulse duration measurements. Plot the obtained waveform and attach a hard copy of the scan to TDS 4. Refer to Figure 11 for an example of the expected waveform.

7. Measure the Turn-On pulse width; record this value on TDS 4.

8. Compute the peak current as follows:

   Measure the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 200 mA/10 mV per division, and the maximum Y value = 276 mV:

   \[ 276 \text{ mV} \times \left( \frac{200 \text{ mA}}{10 \text{ mV}} \right) = 5520 \text{ mA} = 5.52 \text{ amps} \]

   Record this value on TDS 4.

9. The 1st derivative of the current waveform must be calculated. Compute the dI/dT as follows:

   The most probable location of the greatest current demand is during the first positive transition after voltage application. If this is the case, expand the segment of the display and measure the greatest voltage transition in the smallest time transition. The change in voltage times the current/div as selected on the current amplifier produces the change in current. Next divide this change in current by the change in time (in microseconds). This value is dI/dT. Example:

   \begin{align*}
   \text{Change in voltage} & = 144 \text{ mV} \\
   \text{Change in time (microseconds)} & = 19.5 \mu s \\
   \text{Current/div on current amplifier} & = 200 \text{ mA/10 mV} \\
   \end{align*}

   \[ 144 \text{ mV} \times \left( \frac{200 \text{ mA}}{10 \text{ mV}} \right)/19.5 \mu s = 147.7 \text{ mA/\mu s} \]

10. Record the computed value on TDS 4.
Figure 10. Typical Load Current Waveforms from the +28V Pulse Load Bus
3.2.4.2.7 PLB current in warm cal, cold cal and Nadir mode

1. Place instrument in Warm Cal mode.
2. Measure and record PLB steady state current on TDS 4 with a multimeter in the Current mode.
3. Repeat step 2 after placing instrument in Cold Cal mode.
4. Repeat step 2 after placing instrument in Nadir mode.

3.2.4.2.8 Instrument feedback test (PLB). The instrument feedback test contained in the following paragraphs will be performed on the 28 Vdc Pulse Load power line. The peak-to-peak ripple current shall not exceed 43 mA while the instrument is in the Warm Cal mode.

3.2.4.2.8.1 28 Vdc pulse load bus ripple current measurement

1. Connect the instrument and test equipment as shown in Figure 9. Obtain DSA trigger from J2-7.
2. Select 2 mA/10 mV scale on the current amplifier, AC coupled.
3. Set up the DSA as shown below:

Select MEAS MODE
Select Time Capture
Select Capture Select
Select Capture Length; Enter 1; Select Record
Select FREQ
Select Freq Span; Enter 100.0; Select Hz
Select E SMPL Off
Select Time Length; Enter 8.0; Select Sec
Select SELECT MEAS
Select Power Spec
Select CH1 Active
Select WINDOW
Select Hann
Select SOURCE
Select Source Off
Select AVG
Select Avg Off
Select Tim Av Off
Select RANGE
Select Aut 1 Rng up
Select INPUT COUPLE
Select CH1 DC
Select CH1 Ground
Select SELECT TRIG
Select Trig Level; Enter 10; Select mV
Select Arm AU
Select Free Run
Select TRIG DELAY
Enter 0.0; Select Sec
Select COORD
Select Real
Select VIEW INPUT
Select Time Buff
Select SCALE
Select X Fixd Scale: Enter 0.0, 8.0
Select Sec
Select Y Fixd Scale; Enter −10.0, 70.0;
Select mV
Select UNITS
Select Hz (sec)

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5, except place the instrument in the Warm Cal mode.
5. Acquire 8 seconds of data on the DSA by depressing “Start Capture”.
6. Turn OFF the “X” cursor, if it is ON. Turn the “X” cursor ON. The cursor will appear at the highest peak. Make a plot of this display.
7. Select the X-axis scale for 500 ms with the highest peak approximately in the center of the display. Turn the “Y” cursor ON and bound the limits of the current peaks. The delta Y value on the DSA will be used to calculate the peak-to-peak current. Make a plot of this display.

After stabilizing for a minimum of 20 scans, take a full print and attach to TDS 4.
Figure 11. +28V Pulse Load Bus Turn-on Transient
8. Compute the peak current as follows:

Multiply the delta Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 2 mA/10 mV per division, and the maximum Y value = 276 μV:

\[ 0.276 \text{ mV} \times \left( \frac{2 \text{ mA}}{10 \text{ mV}} \right) = 0.0552 \text{ mA} \]

Record this value on TDS 52.

3.2.4.2.2.9 Transient susceptibility and power quality tests. The tests that follow will demonstrate the AMSU-A1 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines.

3.2.4.2.2.9.1 Equipment setup. Set up the test equipment and connect to the instrument as shown in Figure 12.

3.2.4.2.2.9.2 Low frequency load induced transients. The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the Pulse Load Bus power line at the amplitude and duration specified in Figure 13. Perform the Low Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. Place the signal generator in ARB 1 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 13.

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three (3) scans. Remove the signal generator output from the power supply.

7. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

8. Record any deviations in the functional performance of the AMSU instrument on TDS 51.
Figure 12. +28V PLB Transient Susceptibility and Power Quality Tests Setup
3.2.4.2.9.3 High frequency load induced transients. The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43</td>
<td>200 mVpp</td>
</tr>
<tr>
<td>2.86</td>
<td>1.00 Vpp</td>
</tr>
<tr>
<td>6.67</td>
<td>1.50 Vpp</td>
</tr>
</tbody>
</table>

Tolerance on the above values is ±10%.

Perform the High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:

   amplitude ...................... 200 mVpp
   offset ............................. 0.000 V
   frequency ..................... 1.430 Hz

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three (3) scans. Remove the signal generator output from the power supply.

7. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.

8. Repeat steps 2-4 and 6-7 for 2.86 Hz and 1.0 Vpp.

9. Repeat steps 2-4 and 6-7 for 6.67 Hz and 1.5 Vpp.
10. Record any deviations in the functional performance of the AMSU instrument on TDS 5.

### 3.2.4.2.3 Analog telemetry bus

#### 3.2.4.2.3.1 Operating power measurements. The purpose of this test is to calculate the operating power of the Analog Telemetry Bus from measurements taken of the bus voltage and current.

1. Configure the instrument as shown in Figure 14.
2. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.
3. Measure the bus current and record on TDS 5.
4. From the measurements recorded on TDS 5, calculate the operating power for the telemetry bus and record on TDS 5.

#### 3.2.4.2.3.2 Instrument feedback test (ATB). The instrument feedback test contained in the following paragraphs will be performed on the Analog Telemetry Bus power line. The peak-to-peak ripple current shall not exceed 0.29 mA.

##### 3.2.4.2.3.2.1 28 Vdc analog telemetry bus ripple current measurement

1. Connect the instrument and test equipment as shown in Figure 15. Select 2 mA/10 mV scale on the current amplifier, AC coupled.

2. Set up the DSA as follows:

   - **Select MEAS MODE**
     - Select Time Capture
     - Select Capture Select
     - Select Capture Length; Enter 1; Select Record
     - Select FREQ
     - Select Freq Span; Enter 100.0; Select Hz
     - Select E SMPL Off
     - Select Time Length; Enter 8.0; Select Sec
     - Select SELECT MEAS
     - Select Power Spec
     - Select CH1 Active
     - Select WINDOW
     - Select Hann
     - Select SOURCE
     - Select Source Off
     - Select AVG
     - Select Avg Off
     - Select Tim Av Off
     - Select RANGE
     - Select Aut 1 Rng up
   - **Select INPUT COUPLE**
     - Select CH1 DC
     - Select CH1 Ground
     - Select SELECT TRIG
     - Select Trig Level; Enter 10; Select mV
     - Select Arm AU
     - Select Free Run
     - Select TRIG DELAY
     - Enter 0.0; Select Sec
     - Select COORD
     - Select Real
     - Select VIEW INPUT
     - Select Time Buff
     - Select SCALE
     - Select X Fixd Scale; Enter 0.0, 8.0
     - Select Sec
     - Select Y Fixd Scale; Enter -1.0, 7.0;
     - Select mV
     - Select UNITS
     - Select Hz (sec)

3. Ensure that the instrument is OFF (MODULE POWER = DISCONNECT).

4. Acquire 8 seconds of data by depressing “Start Capture”.

5. Turn OFF the “X” cursor, if it is ON. Turn the “X” cursor back ON. The cursor will appear at the highest peak. Make a plot of this display.
Figure 14. +28V Analog Telemetry Bus Test Setup
6. Select the X-axis scale for 500 ms with the highest peak approximately in the center of the display. Turn the "Y" cursor ON and bound the limits of the current peaks. The delta Y value on the DSA will be used to calculate the peak-to-peak current. Make a plot of this display.

7. Compute the peak-to-peak current as follows:
   Multiply the delta Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 2 mA/10 mV per division, and the delta Y value = 276 μV:
   
   \[ 0.276 \text{ mV} \times \left( \frac{2 \text{ mA}}{10 \text{ mV}} \right) = 0.0552 \text{ mA} \]

   Record this value on TDS 52.

3.2.4.2.3.3 Transient susceptibility and power quality tests (ATB). The tests that follow will demonstrate the AMSU-A1 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines.

3.2.4.2.3.3.1 Equipment setup. Set up the test equipment and connect to the instrument as shown in Figure 15 (exceptions: remove the current probe and amplifier; connect the oscilloscope to monitor output of the signal generator).

3.2.4.2.3.3.2 Low frequency load induced transients. The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the power line at the amplitude and duration specified in Figure 16. Perform the Low Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. Place the signal generator in ARB 0 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 16.

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three (3) scans. Remove the signal generator output from the power supply.

7. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22. Attach printouts to TDS 51.

8. Record any deviations in the functional performance of the AMSU instrument on TDS 51.
Figure 15. +28 Vdc Analog Telemetry Bus Ripple Current and Transient Susceptibility Test Setup
Typical transients occurring a number of times per orbit are on the order of 200 mV zero-to-peak for a 1.5A load change.

Figure 16. Load Induced Transient (Main Bus)

3.2.4.2.3.3 *High frequency load induced transients.* The AMSU instrument shall be capable of normal operation before and after positive and negative transients are injected into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.43</td>
<td>200 mVpp</td>
</tr>
<tr>
<td>2.86</td>
<td>1.00 Vpp</td>
</tr>
<tr>
<td>6.67</td>
<td>1.50 Vpp</td>
</tr>
</tbody>
</table>

Tolerance on above values is ±10%.

Perform the High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.
2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:

   amplitude .......................... 200 mVpp
   offset ................................ 0.000 V
   frequency ........................... 1.430 Hz

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.
4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.
5. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.
6. Connect the signal generator to the external power supply. Wait for the instrument to complete three (3) scans. Remove the signal generator output from the power supply.
7. Acquire one (1) Full Scan Mode printout; verify the printout meets the requirements of TDS 19 thru 22.

8. Repeat steps 2-4 and 6-7 for 2.86 Hz and 1.0 Vpp.

9. Repeat steps 2-4 and 6-7 for 6.67 Hz and 1.5 Vpp.

10. Record any deviations in the functional performance of the AMSU instrument on TDS 51.

3.2.4.2.4 +10 volt interface bus test

3.2.4.2.4.1 Operating power measurements. The purpose of this test is to calculate the operating power of the +10 Vdc Interface Bus from measurements taken of the bus voltage and current.

1. Configure the instrument as shown in Figure 17.

2. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

3. Measure the bus current and record on TDS 6.

4. From the measurements recorded on TDS 6, calculate the operating power for the telemetry bus and record on TDS 6.

3.2.4.2.4.2 Instrument feedback test. The instrument feedback test contained in the following paragraphs will be performed on the +10 Vdc Interface Bus power line. The peak-to-peak ripple current shall not exceed 1 mA; in addition, the frequency of the ripple shall not exceed 2.5 MHz.

3.2.4.2.4.2.1 +10 volt interface bus ripple current measurement

1. Connect the instrument and test equipment as shown in Figure 17. Select 2 mA/10 mV scale on the current amplifier, AC coupled.

2. Set up the DSA as shown below:

Select MEAS MODE
   Select Time Capture
   Select Capture Select
   Select Capture Length; Enter 1 Select Record
Select FREQ
   Select Freq Span; Enter 100.0; Select Hz
   Select E SMPL Off
   Select Time Length; Enter 8.0; Select Sec
Select SELECT MEAS
   Select Power Spec
   Select CH1 Active
Select WINDOW
   Select Hann
Select SOURCE
   Select Source Off
Select AVG
   Select Avg Off
   Select Tim Av Off
Select RANGE
   Select Aut 1 Rng up
Select INPUT COUPLE
   Select CH1 DC
   Select CH1 Ground
Select SELECT TRIG
   Select Trig Level; Enter 10, Select mV
   Select Arm AU
   Select Free Run
Select TRIG DELAY
   Enter 0.0; Select Sec
Select COORD
   Select Real
Select VIEW INPUT
   Select Time Buff
Select SCALE
   Select X Fixd Scale: Enter 0.0, 8.0
   Select Sec
   Select Y Fixd Scale; Enter -1.0, 7.0;
   Select mV
Select UNITS
   Select Hz (sec)
Figure 17. +10V Interface Bus Operating Power and Ripple Current Measurements Test Setup
3. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

4. Acquire 8 seconds of data by depressing “Start Capture”.

5. Turn OFF the “X” cursor, if it is ON. Turn the “X” cursor back ON. The cursor will appear at the highest peak. Make a plot of this display.

6. Select the X-axis scale for 500 ms with the highest peak approximately in the center of the display. Turn the “Y” cursor ON and bound the limits of the current peaks. The delta Y value on the DSA will be used to calculate the peak-to-peak current. Make a plot of this display.

7. Compute the peak-to-peak current as follows:

   Multiply the delta Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 2 mA/10 mV per division, and the delta Y value = 276 μV:

   \[ 0.276 \text{ mV} \times (2 \text{ mA}/10 \text{ mV}) = 0.0552 \text{ mA} \]

   Record this value on TDS 52.

3.2.4.2.5 Power input test for LPT. For LPT, test the power input as follows:

1. Configure the unit and test equipment as indicated in Figure 18.

2. Turn the unit ON as described in 3.2.3.5. Set the STE power supply voltage at 28.00 ± 0.05 Vdc using 25-pin breakout box and DVM #1.

   NOTE

   Do not proceed without successful completion of step 2.

3. Record the voltage from DVM #1 and current in Amps from STE current meter on TDS 7.

3.2.4.3 Clock, commands, and data system test. This procedure verifies the clock signal, the commands, and the data requirements specified in S-480-80, GIIS IS-3267415, and UIIS IS-2617547.

3.2.4.3.1 Test sequence. The test sequence shall be as follows:

   a. Clock signals verification

   b. Commands and Digital-B telemetry verification

   c. Data output verification

      (1) Digital-A

      (2) Analog telemetry

      (3) Test points

   d. GSE modes.
Figure 18. +28 V Main Load Bus Test Setup (For LPT Only)
3.2.4.3.2 *Clock signals test.* The following items shall be tested to verify the clock signals. Refer to Figure 19 for graphical representation of these pulses.

a. 1.248 MHz clock
b. 8 seconds frame pulse
c. A1 select pulse
d. C1 shift pulse

![Clock Pulses Timing and Synchronization](image)

Figure 19. Clock Pulses Timing and Synchronization

3.2.4.3.2.1 *1.248 MHz synchronization clock.* Perform the following procedures:

1. Configure the unit and the test equipment as indicated in Figure 20.
2. Connect CHANNEL-1 of the oscilloscope to the 1.248 MHz clock signal as shown in Figure 20.
3. Turn the unit ON as described in 3.2.3.5.

**NOTE**

Do not proceed without successful completion of step 3.
Figure 20. Clock Signals Test Setup
4. Using the oscilloscope, measure the 1.248 MHz clock signal. Record the data and attach the photograph or plot on TDS 8.

3.2.4.3.2.2 C1 shift pulse verification. Connect CHANNEL-2 of the oscilloscope to Pin 2 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 9.

3.2.4.3.2.3 A1 select pulse verification. Connect CHANNEL-2 of the oscilloscope to Pin 6 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 10.

3.2.4.3.2.4 8-seconds frame sync pulse verification

1. Connect CHANNEL-2 of the oscilloscope to Pin 7 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 11. (Record of "C" timing only, is required.)

2. Turn the unit OFF by executing the softkey command [11] MODULE TOTALLY OFF to OFF. Leave both breakout boxes in place.

3.2.4.3.2.5 Synchronization signal relationship. The following synchronization signal relationship shall be verified.

a. A1 select pulse and the 8-second frame sync pulse

1. With the unit off, configure the unit and the test equipment as indicated in Figure 21.

2. Connect CHANNEL-1 of the oscilloscope to the breakout box, Pin 6 (A1).

3. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

4. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 12.

5. From the photograph or plot, verify the synchronization as described in TDS 12. Record pass or fail.

b. A1 select pulse and C1 shift pulse

1. Connect CHANNEL-2 of the oscilloscope to the breakout box Pin 2 (C1 shift pulse).

2. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

3. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 12, sheet 2.

4. From the photograph or plot, verify the synchronization as described in TDS 12, sheet 2. Record pass or fail.

c. A1 select pulse and 1.248 MHz clock.

1. Connect CHANNEL-2 of the oscilloscope to the clock connector located at the rear of the STE.

2. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

3. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 13.
1.248 MHz Clock Signal

From Rear Panel

C1 Shift Pulse

1.248 MHz Clock Signal

AMSU-A1 Instrument

28V Power Supply

Oscilloscope

CH-1

CH-2

8 Sec Frame

A1 Select Pulse

9-Pin Breakout Box

2 7 3 6

Figure 21. Synchronization Signal Relationships Test Setup
4. From the photograph or plot, verify the synchronization as described in TDS 13. Record pass or fail.

3.2.4.3.3 Commands and digital-B telemetry test. Commands and digital-B telemetry shall be verified in accordance with the following paragraphs.

3.2.4.3.3.1 Module totally off. Commands and digital-B telemetry, with the module totally off, shall be tested as follows:

1. Turn the unit on as follows:
   c. Press [14] COMMANDS (from 2nd screen)

Verify the screen displays the default parameters below.

<table>
<thead>
<tr>
<th>No</th>
<th>Parameter</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>MODULE POWER =</td>
<td>CONNECT</td>
<td>NO [15]</td>
</tr>
<tr>
<td>10</td>
<td>SURVIVAL HTR PWR =</td>
<td>OFF</td>
<td>NO [16]</td>
</tr>
<tr>
<td>11</td>
<td>MODULE TOTALLY OFF =</td>
<td>ON</td>
<td>NO [17]</td>
</tr>
<tr>
<td>12</td>
<td>SCANNER A1-1 POWER =</td>
<td>ON</td>
<td>PLL#1</td>
</tr>
<tr>
<td>13</td>
<td>SCANNER A1-2 POWER =</td>
<td>ON</td>
<td>ZERO [19]</td>
</tr>
<tr>
<td>14</td>
<td>ANTENNA WARM CAL POS =</td>
<td>YES</td>
<td>ZERO [20]</td>
</tr>
<tr>
<td>15</td>
<td>POWER</td>
<td>ON</td>
<td></td>
</tr>
</tbody>
</table>


3. Wait at least 18 seconds, then verify that the following events are in effect:
   b. [12] SCANNER A1-1 POWER = OFF.
   d. [10] SURVIVAL HEATER POWER = OFF

Antenna reflectors for A1-1 and A1-2 pointing toward the warm load.

4. Record the above observations on TDS 14.

3.2.4.3.3.2 Survival heater power ON/OFF command. The survival heater power ON/OFF command shall be tested as follows:

1. Execute command [10] SURVIVAL HEATER POWER to ON mode. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 14.

2. Execute command [10] SURVIVAL HEATER to OFF mode. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 14.

3.2.4.3.3 Module power connect command. The module power connect command shall be tested as follows:
1. Execute command [9] MODULE POWER to CONNECT mode. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 14.

2. Verify that the current at the STE power supply is 0.5 to 4.3 Amperes. Record this information on TDS 14.

3.2.4.3.3.4 Phase lock loop (PLL) PLLO No. 1 / PLLO No. 2. The PLL PLLO No. 1/PLLO No. 2 command shall be tested as follows:

1. Execute [18] PLL POWER = PLLO#2
   Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 14.

2. Execute [18] PLL POWER = PLLO#1
   Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 14.

3.2.4.3.3.5 Scanner commands verification. The scanner commands shall be tested as follows:

1. Execute commands as necessary to obtain the following configuration:

   COMMANDS
   -----------------
   [9] MODULE POWER = CONNECT
   [10] SURVIVAL HTR PWR = OFF
   [11] MODULE TOTALLY OFF = ON
   [12] SCANNER A1-1 POWER = ON
   [14] ANTENNA WARM CAL POS = NO
   POWER [4] ON
   -----------------

   Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 15.

   Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 16.

   Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 17.

3.2.4.3.3.6 Scanner position commands (A1-1 and A1-2) verification. Verify scanner position command operation as follows:

   **NOTE**

   Verification of the scan position is applicable to both antenna reflectors located at the high and low bays of the instrument (A1-1 and A1-2).

1. Execute: [14] ANTENNA WARM CAL POS = YES
   [17] ANTENNA FULL SCAN MODE = NO
   Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.
2. Execute:  
[15] ANTEenna IN COLD CAL POS = YES  
[14] ANTEenna WARM CAL POS = NO

Execute:  
[19] COLD CAL POS MSB = zero  
[20] COLD CAL POS LSB = one

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

3. Execute:  
[19] COLD CAL POSITION MSB = ONE  
[20] COLD CAL POSITION LSB = ZERO

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

4. Execute:  
[19] COLD CAL POSITION MSB = ONE  
[20] COLD CAL POSITION LSB = ONE

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

5. Execute:  
[19] COLD CAL POSITION MSB = ZERO  
[20] COLD CAL POSITION LSB = ZERO

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

6. Execute:  
[16] ANTEenna IN NADIR POSITION = YES  
[15] ANTEenna IN COLD CAL POS = NO

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

7. Execute:  
[14] ANTEenna WARM CAL POS = YES

Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 18.

3.2.4.3.4 Digital-A data output verification. The following items shall be tested to verify the digital-A data output:

a. Full scan (3.2.4.3.4.1)  
b. Warm load (3.2.4.3.4.2)  
c. Cold cal (3.2.4.3.4.3)  
d. Nadir (3.2.4.3.4.4).

For each of the above scan modes, the following parameters will be subject to pass/fail criterion:

[I] Sync. sequence  
[II] Unit I.D. and serial number  
[III] Digital-B serial data verification  
[IV] Reflector positions
Radiometric data (scene data)

Radiometric data shall be obtained from two channels only, Channels 9 and 3. Channel 9 is physically located at the high bay of the sensor (A1-1 location) and Channel 3 is located at the lower bay of the sensor (A1-2 location).

Temperature sensors.

For the cold cal mode, reflector position [IV], verify the following:

(a) Cold cal position with MSB=1 and LSB=0
(b) Cold cal position with MSB=0 and LSB=1
(c) Cold cal position with MSB=1 and LSB=1.

NOTE

The calibration data for the selected AMSU-A1 sensor serial number is required prior to the start of this test. Refer to 3.2.4.3.4.1.

3.2.4.3.4.1 Full scan mode. The digital-A data output in full-scan mode shall be tested as follows:

1. Turn the unit on. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMANDS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT</td>
<td></td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF</td>
<td></td>
</tr>
<tr>
<td>[11] MODULE TOTALLY OFF = ON</td>
<td></td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON</td>
<td></td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS = NO</td>
<td></td>
</tr>
<tr>
<td>POWER [4] ON</td>
<td></td>
</tr>
</tbody>
</table>

2. Obtain a full printout (9 pages) of all the parameters (I through VI) described above, by touching the PRINT [3] FULL touch area. The computer will start printing all 9 pages of data.

3. Label 1st page of 9 pages with the unit serial number and the paragraph number corresponding to this test.

(I), (II), and (III) Sync, Unit ID, and Digital-B Data

4. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 19. Record pass or fail.

Reflector position

NOTE

To verify the following steps, the operator may print out the individual parameters by using AE-26157 and attach the data to each TDS.

5. Using the individual printout, verify that there is no “E” ERROR Flag (for S/N 102 through 104) on the computer printout. Record pass or fail on TDS 20. For S/N 105 and up, verify that position values are within ± 10 counts from requirement provided in TDS 6, AE-26002/1.
Radiometric data

6. Using the individual printout, verify that the data are within the values specified on TDS 21. Record pass or fail.

Temperature sensors

7. Using the individual printout, verify that elements 1090 through 1180 are within the values specified on TDS 22 (sheets 1 and 2). Record pass or fail.

Warm cal mode. The digital-A data output, in warm-cal mode shall be tested as follows:

1. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF</td>
</tr>
<tr>
<td>[11] MODULE TOTALLY OFF = ON</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON</td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS = YES</td>
</tr>
</tbody>
</table>

Power [4] ON

[10] - No [16]
[12] - PLL#1 [18]

Sync, Unit ID, and Digital-B Data

2. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 23. Record pass or fail.

NOTE
To verify the following steps, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS.

Reflector position

3. Using the individual printout, verify that there is no "E" ERROR Flag (for S/N 102 through 104) on the computer printout. Record pass or fail on TDS 24. For S/N 105 and up, verify that position values are within ±10 counts from requirement provided in TDS 6, AE-26002/1.

Radiometric data

4. Using the individual printout, verify that the data are within the values specified on TDS 25. Record pass or fail.

Temperature sensors

5. Using the individual printout, verify that elements 1090 through 1180 are within the values specified on TDS 26 (sheets 1 and 2). Record pass or fail.

Cold cal mode. The digital-A data output, in cold-cal mode, shall be tested as follows:
1. Execute commands as necessary to obtain the following configuration:

| COMMANDS |
|------------------|--|
| [10] SURVIVAL HTR PWR = OFF | ANTENNA IN NADIR POS = NO [16] |
| [12] SCANNER A1-1 POWER = ON | PLL POWER = PLL04 [18] |
| [14] ANTENNA WARM CAL POS = NO | COLD CAL POSITION LSB = ZERO [20] |

To verify the following steps, the operator may print out the individual parameters by using AE-26157 and attach the data to each TDS.

III. Reflector position

3. Using the individual printout, verify that there is no "E" ERROR Flag (for S/N 102 through 104) on the computer printout for steps 4a, 4b, 4c, and 4d. For S/N 105 and up, verify that position values are within ± 10 counts from requirement provided in TDS 6, AE-26002/1.

4. To test the cold cal reflector position, perform the following substeps:

a. Using AE-26157; select reflector position screen, execute PRINT [2] SCREEN ONLY, and attach the data to TDS 28. Verify that there is no "E" ERROR Flag (for S/N 102 through 104) on the computer printout. Record pass or fail on TDS 28. For S/N 105 and up, verify that position values are within ± 10 counts from requirement provided in TDS 6, AE-26002/1.

b. Execute commands [19] COLD CAL POSITION MSB to 0 and [20] COLD CAL POSITION LSB to 1. Repeat substep a., then proceed to substep c.

c. Execute commands [19] COLD CAL POSITION MSB to 1 and [20] COLD CAL POSITION LSB to 0. Repeat substep a., then proceed to substep d.

d. Execute commands [19] COLD CAL POSITION MSB to 1 and [20] COLD CAL POSITION LSB to 1. Repeat substep a., then proceed to substep e.

e. Execute commands [19] COLD CAL POSITION MSB to 0 and [20] COLD CAL POSITION LSB to 0.

IV. Radiometric data

5. Using the individual printout, verify that the data are within the values specified on TDS 29. Record pass or fail.
3.2.4.3.4 **Nadir cal mode.** The digital-A data output, in nadir-cal mode, shall be tested as follows:

1. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT ANTELLNA IN COLD CAL POS = NO [15]</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF ANTELLNA IN NADIR POS = YES [16]</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON PLL POWER = PLL0#1 [18]</td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS = NO COLD CAL POSITION LSB = ZERO [20]</td>
</tr>
</tbody>
</table>

2. Using the individual printout, verify that elements 0001 through 0008 are within the required values specified in TDS 31. Record pass or fail.

**NOTE**

To verify the following steps, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS.

3. Using the individual printout, verify that there is no "E" ERROR Flag (for S/N 102 through 104) on the computer printout. Record pass or fail on TDS 24. For S/N 105 and up, verify that position values are within ±10 counts from requirement provided in TDS 6, AE-26002/1

4. Using the individual printout, verify that the data are within the values specified on TDS 32. Record pass or fail.

5. Using the individual printout, verify that the elements 1090 through 1180 are within the values specified on TDS 33 (sheets 1 and 2). Record pass or fail.

3.2.4.3.5 **Analog telemetry test.** The purpose of this test is to verify that the 26 analog telemetry signals are within requirements. The purpose of the analog telemetry signals is to provide information about the functionality of the subsystems during normal operation of the unit. The analog telemetry signals shall be verified in two ways: (1) by measuring the analog telemetry signals directly at the interfacing connector and (2) by use of the STE.
3.2.4.3.5.1 Analog TLM signals measurements connector J6. Measure analog TLM signals at connector J6 as follows:

1. Configure the unit and the STE as indicated in Figure 22. Verify that unit power is off prior to the installation of the breakout boxes. To turn the unit off, select the Commands Menu and execute command [9] MODULE POWER = DISCONNECT and POWER [4] OFF. Manually turn off the STE 28 V power supply located inside the STE console.

2. Turn the unit on as follows:
   (a) Turn on the STE 28 V power supply.
   (b) On the Commands Menu, execute: POWER [4] ON and [9] MODULE POWER = CONNECT. Verify the display is as follows.

<table>
<thead>
<tr>
<th>COMMANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER = CONNECT</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR = OFF</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER = ON</td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS = NO</td>
</tr>
<tr>
<td>POWER [4] ON</td>
</tr>
</tbody>
</table>

   |                               |
   | ANTEENA IN COLD CAL POS = NO |
   | ANTEENA IN NADIR POS=        |
   | ANTENNA FULL SCAN MODE = YES |
   | PLL POWER = PLL0#1           |
   | COLD CAL POSITION MSB = ZERO |
   | COLD CAL POSITION LSB = ZERO |

3. Using the “28 V Analog Telemetry Bus Return” (J1-10) as a reference ground, measure and record the six temperature sensor voltages in the order specified on TDS 34.

4. Using the “Signal Ground” (J2-03) as a reference ground, measure and record the remaining analog telemetry voltage levels in the order specified on TDS 34.

5. Leave the unit on in preparation for the next test.

3.2.4.3.5.2 Analog TLM signal measurements using the STE. Analog TLM signal measurements using the STE shall be taken as follows:

1. Using the individual printout, verify that the data matches the values specified on TDS 35. Record pass or fail.
2. Attach computer individual printout to TDS 35.

3.2.4.3.6 Test point verification. The purpose of this test is to verify the performance of the integrator and its associated clock pulses. Figure 2 shows the integration waveform and the clock signals. Test point verification consists of the following parameters:

   a. Integration/Hold and Dump Clock Signals. (3.2.4.3.6.1) (Time and amplitude)
   b. Integration Time (Analog Output). (3.2.4.3.6.2) (Time and amplitude for all 13 channels.)
For the measurements of the temperature sensor, use J1-10 as a ground, for the remaining analog signals use J2-3 as a reference ground.

Figure 22. Analog Telemetry Signal Verification Test Setup
3.2.4.3.6.1 **Integration/hold and dump clock signals.** The integration/hold and dump clock signals shall be tested as follows:

1. Referring to Figure 23, configure the oscilloscope as follows:
   
   (a) Channel-2 to J7-06 integration/hold clock signal.
   
   (b) Channel-1 to J7-24 dump signal clock.
   
   (c) Channel-1 (shielded cable) to J7-05 (I/H and Dump RTN).
   
   (d) Internal trigger mode to channel-1.
   
   (e) Amplitude and Time optimized for best resolution.

2. Photograph or plot the oscilloscope display and attach the photograph or plot to TDS 36.

3. From the photograph or plot, measure time and amplitude for the integrate/hold and dump clock signals. Verify that the data obtained are within the requirements specified on TDS 36 and Figure 2.

4. Leave the equipment in place and the unit turned on in preparation for the next test.

3.2.4.3.6.2 **Integration time (analog outputs).** The analog outputs integration time shall be tested as follows:

1. Reconfigure the test equipment as indicated in Figure 24.

2. Connect the oscilloscope, channel-2 positive line to J7-XX of the 37-pin breakout box. Where: XX indicates the pinout distribution for all the 13 channels as shown in Table III.

3. Start with the first channel of the above list. Adjust the oscilloscope for best amplitude and time resolution. The displayed signals should look like Figure 2.

4. Photograph or plot the display and attach it to the corresponding TDS (TDSs 37 through 43).

5. From the photograph or plot, measure the integration time and the amplitude. Verify that the data obtained is within the requirements specified in TDSs 37 through 43.

6. Repeat steps 2 through 5 to measure the integration time (analog output) for the remaining channels.

7. Leave the unit turned on and the test equipment in place in preparation for the next test.
Figure 23. Integration/Hold and Dump Signals Verification Test Setup
3.2.4.3.6.3 PLLO No. 1 verification. The PLLO No. 1 shall be verified as follows:

1. Reconfigure the oscilloscope as indicated in Figure 25. Connect the oscilloscope channel-1 to J7-22 (PLLO No. 1).

2. From the Commands Menu of the STE, verify that the PLLO is selected in PLLO No. 1 as follows:

\[ \text{PLL POWER} = \text{PLLO#1} \ [18] \]

3. For S/N 101 - S/N 104, adjust the oscilloscope for best amplitude and time base. If the PLLO is locked properly, the oscilloscope will display a dc-voltage level of -15 to +15 V. Record the voltage level on TDS 44. Record PASS. (Any dc level recorded is considered PASS). If the PLLO is not locked properly, the scope will display a waveform similar to this:

\[ \begin{align*}
+15V \\
0V \\
-15V
\end{align*} \]

Record FAIL on TDS 44. Discontinue the test until the deficiency is corrected.

4. For S/N 105 and above, if the PLLO is locked properly, the oscilloscope will display a dc-voltage = 4.0 \pm 1 V. If the PLLO is not locked, the oscilloscope will display a dc-voltage of +0.61 \pm 0.30 V. If PLO is OFF, the oscilloscope will display a dc-voltage of 0.0 \pm 0.2 V. If the PLLO is trying to acquire lock, the oscilloscope will display a various dc level. Record the voltage level on TDS 44.
Figure 24. Integration Time (Analog Output) Verification Setup
Table III. Location and Frequency of Channel 3 through 15 Analog Outputs

<table>
<thead>
<tr>
<th>Breakout Box Pin Location</th>
<th>Channel Distribution</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>J7-08</td>
<td>Channel-03 Analog Output</td>
<td>50.3 GHz</td>
</tr>
<tr>
<td>J7-09</td>
<td>Channel-04 Analog Output</td>
<td>52.80 GHz</td>
</tr>
<tr>
<td>J7-10</td>
<td>Channel-05 Analog Output</td>
<td>53.596 GHz</td>
</tr>
<tr>
<td>J7-11</td>
<td>Channel-06 Analog Output</td>
<td>54.400 GHz</td>
</tr>
<tr>
<td>J7-12</td>
<td>Channel-07 Analog Output</td>
<td>54.940 GHz</td>
</tr>
<tr>
<td>J7-13</td>
<td>Channel-08 Analog Output</td>
<td>55.500 GHz</td>
</tr>
<tr>
<td>J7-14</td>
<td>Channel-09 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-27</td>
<td>Channel-10 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-28</td>
<td>Channel-11 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-29</td>
<td>Channel-12 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-30</td>
<td>Channel-13 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-31</td>
<td>Channel-14 Analog Output</td>
<td>57.290 GHz PLLO</td>
</tr>
<tr>
<td>J7-32</td>
<td>Channel-15 Analog Output</td>
<td>89.000 GHz</td>
</tr>
</tbody>
</table>

3.2.4.3.6.4 PLLO No. 2 verification. The PLLO No. 2 shall be verified as follows:

1. Reconfigure the oscilloscope as indicated in Figure 25. Connect the oscilloscope channel-1 to J7-03 (PLLO No. 2).

2. Select the PLLO No. 2 unit by executing the following command:

   [18] PLL POWER = PLLO#2

3. For S/N 101 - S/N 104, adjust the oscilloscope for best amplitude and time base. If the PLLO is locked properly, the oscilloscope will display a dc-voltage level of -15 to +15 V. Record the voltage level on TDS 44. Record pass. (Any dc level recorded is considered PASS). If the PLLO is not locked properly, the scope will display a waveform similar to this:

   ![Waveform Image]

   Record FAIL on TDS 44. Discontinue the test until the deficiency is corrected.

4. For S/N 105 and above, if the PLLO is locked properly, the oscilloscope will display a dc-voltage = 4.0 ±1 V. If the PLLO is not locked, the oscilloscope will display a dc-voltage of +0.61 ±0.30 V. If PLO is OFF, the oscilloscope will display a dc-voltage of 0.0 ±0.2 V. If the PLLO is trying to acquire lock, the oscilloscope will display a various dc level. Record the voltage level on TDS 44.
Figure 25. PLLO No. 1/No. 2 Test Setup
Figure 26. GSE Modes Verification Test
2. Turn the unit on. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMANDS</th>
<th>[9] MODULE POWER = CONNECT</th>
<th>ANTEenna IN COLD CAL POS = NO [15]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[10] SURvIVAL HTR PWR = OFF</td>
<td>ANTEenna IN NADIR POS= NO [16]</td>
</tr>
<tr>
<td></td>
<td>[12] SCANNER A1-1 POWER = ON</td>
<td>PLL POWER = PLL0#1 [18]</td>
</tr>
<tr>
<td></td>
<td>[14] ANTEenna WARM CAL POS = NO</td>
<td>COLD CAL POSITION LSB = ZERO [20]</td>
</tr>
</tbody>
</table>

Wait at least 18 seconds until the sending commands are acknowledged by the STE. At this point, the unit should be in the NO MODE with the STE collecting data.

3. Obtain a printout (9 pages) for all of the parameters ([I] through [VI]) described in 3.2.4.3.7 as follows:

(a) On Commands Menu, press: RETURN [1].

(b) On Main Menu, select: [10] SELF TEST.

(c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: Enter GSE mode {0 to 15}.)

(d) Select corresponding GSE mode under test.

(e) Press PRINT [3] FULL. The computer will start printing all 9 pages.

3.2.4.3.7.2 GSE Mode-1. The GSE mode-1 shall be tested as follows:

[I], [II], and [III] Sync, Unit ID, and Digital-B

1. Using the printout, verify that elements 1 through 8 are within the values specified on TDS 45. Record pass or fail.

NOTE

To verify the following steps, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS.

[IV] Reflectors

2. Using the individual printout, verify that the reflector positions are within the values specified in AE-26002/1, TDS 5 and 6. Record pass or fail on TDS 46.

[V] Radiometric Data

3. Using the individual printout, verify that the radiometric data are within the values specified on TDS 47.

[VI] Temperature Sensors

4. Using the individual printout, verify that elements 1090 through 1180 are within the values specified on TDS 48 (sheets 1 and 2). Record pass or fail.
3.2.4.3.7.3 *GSE Mode-2.* The GSE Mode-2 shall be tested as follows:

1. Obtain a printout (9 pages) for all of the parameters ([1] through [V]) described in 3.2.4.3.7 as follows:
   
   (a) Return to the Main Menu by pressing: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.

   (The computer will prompt: Enter GSE mode {0 to 15}.)

   (d) Select GSE mode 2 at the prompt.

   (e) Press PRINT [3] FULL. The computer will start printing all 9 pages.

   **NOTE**

   To verify the following step, the operator may print out the individual parameters by using AE-26157 and attach the data to each TDS or the 9 full page printout may be used.

   **[IV] Reflector Positions**

   2. Using Pages 1 through 6 of the printout, verify that the reflector positions are within the values specified in AE-26002/1, TDS 5 and 6. Record pass or fail on TDS 46.

3.2.4.3.7.4 *GSE Mode-3.* The GSE Mode-3 shall be tested as follows:

1. Obtain a printout (9 pages) for all of the parameters ([1] through [VI]) described in 3.2.4.3.7 as follows:

   (a) Return to the Main Menu by pressing: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.

   (The computer will prompt: Enter GSE mode {0 to 15}.)

   (d) Select GSE mode 3 at the prompt.

   **NOTE**

   To verify the following step, the operator may print out the individual parameters by using AE-26157 and attach the data to each TDS or the 9 full page printout may be used.

   **[IV] Reflector Positions**

   2. Verify that both A1-1 and A1-2 reflectors increment one step every eight seconds.

3.2.4.3.7.5 *GSE Mode-4.* The GSE Mode-4 shall be tested as follows:

1. Obtain a printout (9 pages) for all of the parameters ([1] through [VI]) described in 3.2.4.3.7 as follows:

   (a) Return to the Main Menu by pressing: RETURN [1].
(b) On Main Menu, select: [10] SELF TEST.

(c) On Self Test Menu, select: [7] RUN GSE MODE.
(The computer will prompt: Enter GSE mode {0 to 15}.)

(d) Select GSE mode 4 at the prompt.

(e) Press PRINT [3] FULL. The computer will start printing all 9 pages.

NOTE
To verify the following step, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS or the 9 full page printout may be used.

[IV] Reflector Positions

2. Using pages 1 through 6 of the printout, verify that the reflector positions are within the values specified in AE-26002/1, TDS 5 and 6. Record pass or fail on TDS 46.

3.2.4.3.7.6 GSE Mode-5. The GSE Mode-5 shall be tested as follows:

1. Obtain a printout (9 pages) for all of the parameters ([I] through [VI]) described in 3.2.4.3.7 as follows:
   (a) Return to the Main Menu by pressing: RETURN [1].
   (b) On Main Menu, select: [10] SELF TEST.
   (c) On Self Test Menu, select: [7] RUN GSE MODE.
      (The computer will prompt: Enter GSE mode {0 to 15}.)
   (d) Select GSE mode 5 at the prompt.
   (e) Press PRINT [3] FULL. The computer will start printing all 9 pages.

NOTE
To verify the following step, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS or the 9 full page printout may be used.

[IV] Reflector Positions

2. Using pages 1 through 6 of the printout, verify that the reflector positions are within the values specified in AE-26002/1, TDS 5 and 6. Record pass or fail on TDS 46.

3.2.4.3.7.7 GSE Mode-7. The GSE Mode-7 shall be tested as follows:

1. Obtain a printout (9 pages) for all of the parameters ([I] through [VI]) described in 3.2.4.3.7 as follows:
   (a) Return to the Main Menu by pressing: RETURN [1].
   (b) On Main Menu, select: [10] SELF TEST.
(c) On Self Test Menu, select: [7] RUN GSE MODE.
(The computer will prompt: Enter GSE mode {0 to 15}.)

(d) Select GSE mode 7 at the prompt.

(e) Press PRINT [3] FULL. The computer will start printing all 9 pages.

NOTE

To verify the following steps, the operator may printout the individual parameters by using AE-26157 and attach the data to each TDS or he may use the 9 page full printout.

[IV] Reflector Positions

2. Using pages 1 through 6 of the printout, verify that the reflector positions are within the values specified in AE-26002/1, TDS 5 and 6. Record pass or fail on TDS 46.

3. Set the STE to GSE MODE-0, failure to do so will cause the STE to produce faulty data when in normal mode. To enter GSE-MODE-0 into the computer:

   (a) Return to the Main Menu by pressing: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
      (The computer will prompt: Enter GSE mode {0 to 15}.)

   (d) Select GSE mode 0.

3.2.4.4 Radiometer functional test. The purpose of the radiometer functional test is to verify the performance of the AMSU-A1 radiometer at the system level. This test shall consist of the following subtests:

   a. PLLO frequency measurements 3.2.4.4.1

   b. Relative NEAT measurements 3.2.4.4.2

3.2.4.4.1 PLLO frequency measurements. Measure the PLLO frequencies as follows:

1. Prepare the unit and the test equipment as indicated in Figure 27. Frequency verification for the receiver shall be performed on the following frequency (see Figure 28 for sample plot):

   (A1-1) Ch-9,10,11,12,13 and 14: 57.290344 GHz (PLLO No. 1 and PLLO No. 2)

2. Turn on the unit by using the procedure stated in 3.2.3.5. Allow not less than one hour for the equipment to warm-up and for the unit to stabilize.

   On the Commands Menu, execute the following commands:

   (a) [14] ANTENNA WARM CAL POS = NO

   (b) [15] ANTENNA COLD CAL POS = NO
Figure 27. Configuration for RF Measurements
3.2.4.4.2 Relative radiometer NEAT measurements. The purpose of this test is to perform a preliminary evaluation of the radiometer NEAT at a system level. Since the STE is not in the thermal-vacuum configuration, no temperature readings from the cold load are available. To compute the NEAT for this test, the temperature used for the cold load shall be LN2 temperature.

The data obtained from this test are considered as relative NEAT and are to be used as a diagnostic tool to verify proper operation of the A/D converters and the spacecraft interface.

The equation to determine relative NEAT is as follows:

\[
NEAT = \frac{SD \times (Th - Tc)}{M - N}
\]

where:

- SD = Standard deviation of 120 samples at hot temperature (warm load)
- Th = Standard room temperature = 300 K
- Tc = Standard LN2 temperature = 80 K

3. Record the measured frequencies on TDS 49, and plotter data. Repeat step 2 for PLLO No. 2.

4. Remove the test equipment but leave the unit on in preparation for the next test.
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\[ M = \text{Average of hot counts (120 samples)} \]
\[ N = \text{Average of cold counts (30 samples)} \]

The sequence of testing shall be as follows:

a. Equipment preparation and setup configuration
b. Warm load radiometric data
c. Cold load radiometric data
d. Relative NEAT data collection

3.2.4.4.2.1 Equipment preparation and setup configuration. The equipment shall be set up as follows:

**WARNING**

The use of liquid nitrogen in a confined poorly ventilated area can cause asphyxiation and death due to a lack of oxygen (oxygen concentration below 20 percent). Accidental contact with liquid nitrogen will cause severe frostbite to the eyes or skin. When handling liquid nitrogen, personnel shall observe the following safety precautions:

a. Ensure that the work area is well ventilated to prevent excessive gas buildup.

b. To protect your eyes always wear a face shield or safety goggles (safety glasses without side shields do not provide adequate protection).

c. To protect exposed skin, always wear an apron when pouring LN2 and whenever exposed to LN2, always wear a lab coat, gloves made for cryogenic work, cuffless trousers (worn outside the boots or shoes), and safety shoes.

d. Do not fill target fuller than 1.0 inch from the top. Fill target at the floor level, away from unit.

e. Do not move filled target without cover in place.

1. Configure the test equipment and the unit as indicated in Figure 29, except for the cold loads.

2. Execute commands as necessary to obtain the following configuration:

<table>
<thead>
<tr>
<th>COMMAND</th>
<th>DESCRIPTION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[9] MODULE POWER =</td>
<td>CONNECT</td>
<td>ANTENNA IN COLD CAL POS =</td>
</tr>
<tr>
<td>[10] SURVIVAL HTR PWR =</td>
<td>OFF</td>
<td>ANTENNA IN NADIR POS =</td>
</tr>
<tr>
<td>[12] SCANNER A1-1 POWER =</td>
<td>ON</td>
<td>PLL POWER =</td>
</tr>
<tr>
<td>[14] ANTENNA WARM CAL POS =</td>
<td>YES</td>
<td>COLD CAL POSITION LSB =</td>
</tr>
</tbody>
</table>

POWER [4] ON
3. Allow 30 minutes for the unit to stabilize.

3.2.4.2.2 Relative $\Delta T$ data collection

1. Return to the Main Menu by pressing [1] RETURN.

2. On the Main Menu, select [13] FUNCTIONAL TEST. (The STE will automatically command the unit to position the antenna reflector to the warm and cold loads as it is taking data.)

3. Wait approximately one minute to verify that the $\Delta T$ results are displayed on the screen. Obtain a printout. Repeat step 2 four times and obtain four additional printouts. Average $\Delta T$ from these five data points. Enter the values on TDS 50. Attach the printout to the data sheet.

4. Repeat steps 1, 2, and 3 for the PLLO No. 2. Allow 30 minutes for the unit to stabilize after switching to PLLO No. 2.

5. Remove the cold loads and associated hardware.

3.2.4.5 Channel identification test. The purpose of the channel identification test is to verify the proper final configuration/assembly of each radiometer channel from antenna input to the spacecraft interface.

1. Configure the unit and test equipment as shown in Figures 26 and 32.
2. Connect the STE to the instrument using the following STE interface cables.
   a. STE interface cable J1 (1356648-1)
   b. STE interface cable J2 (1356648-2)
   c. STE interface cable J3 (1356648-3)
   d. STE interface cable J4 (1356648-4)

3. Follow the turn-on procedure per para. 3.2.3.5.

4. Enter the STE command “SCANNER A1-1 POWER.” Wait 18 seconds before issuing the next command.

5. Enter the STE command “SCANNER A1-2 POWER.” Wait 18 seconds before issuing the next command.

6. Enter the STE command “ANTENNA COLD CAL.” Wait 18 seconds before issuing the next command.
   Both reflectors should scan to the cold calibration beam position.

7. Enter the STE command “[1] RETURN” to return to the monitor only screen.

8. Enter the STE command “[10] DIGITAL-A.” The STE should now display the digital-A data screen shown in Figure 30. From this screen enter the STE command “[9] BEAM POSITION NN-ALL CHANNELS.”

9. The STE then asks “ENTER BEAM POSITION NO (1 TO 30).” Enter “30” to show the radiometric counts data for channels 3-15. The STE should now display the radiometric data screen shown in Figure 31, except with a different set of count data.

10. Allow the instrument to stabilize for approximately 20 minutes. Enter the STE command “[2]” to obtain a screen only printout.

11. Configure the unit and test equipment as shown in Figure 32. Turn ON the sweeper and allow to warm up approximately 10 minutes. Make sure that the RF power is OFF during sweeper warm up.

   CAUTION

   Extreme care must be used when turning on RF power. When RF power is first applied the multiplier/gain horn should be approximately three to four feet from the unit. The RF power setting should be no greater than -20 dBm.

12. Set the sweeper frequency to 50.35 ±0.01 GHz and set the RF power level to -20 dBm. Position the multiplier/gain horn three to four feet from the instrument so that the A1-2 antenna and gain horn are approximately aligned (see Figure 32). Rotate the gain horn, if needed, to the vertical polarization position.

13. Turn ON the RF power making sure the power level is set to -20 dBm. Allow the multiplier to warm up approximately five minutes.

14. At the STE screen compare the radiometric data counts of channel 3 to the counts printed out at step 10. Enter the STE command “[2]” to obtain a screen only printout.

15. From the printouts obtained in steps 10 and 14, verify that the radiometric data counts for channel 3 have increased significantly, approximately 1000 or more, and that the other channels’ data counts have remained relatively unchanged, less than 300 counts.

16. Record the counts difference on TDS 21 of channel 3 from the printouts obtained in steps 10 and 14 and attach printouts to TDS 21.

17. Repeat steps 12 through 16 for the frequencies and polarizations listed on TDS 21.
18. After all A1 channels have been identified, turn OFF the RF power. Return the reflectors to the warm cal position.

19. Turn the STE Q/Main and N/Pulse switches to OFF.

20. Turn the STE power supply panel main power switch OFF.

---

**Figure 30. Digital-A Data Screen**
Figure 31. Radiometric Data Screen

Figure 32. Channel Identification Setup
4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Aerojet Quality Assurance shall inspect in accordance with the requirements of this test procedure and S-480-79 and S-480-80. Quality Control shall verify all test set-ups prior to start of test. Bonded software shall be used for all tests and shall be obtained from Quality Control. Quality Control shall review all test data for conformance to success criteria. The test data shall include test limits. For tests that satisfy requirements from S-480-80 on protoflight and flight units, customer representatives shall be invited to monitor tests and shall be invited to review the data and show approval on the test data sheets.

4.1.1 Test facilities. Unless otherwise specified, the examinations and tests described herein shall be conducted at GenCorp Aerojet, Azusa Operations, Azusa, CA.

4.1.2 Electrostatic Device (ESD) handling. All electronic hardware shall be handled in accordance with Aerojet Standard STD-2454.

4.2 Monitoring procedures. All tests in this procedure shall be monitored by quality control.

4.2.1 Test equipment. Test equipment calibration procedures shall comply with the requirements of MIL-STD-45662.

4.2.2 Software. Bonded software shall be used at all times.

4.3 Monitoring procedures for materials. Not applicable.

4.4 Certification. Certification for handling ESD-sensitive equipment is required for all personnel working on the assembly and test of the AMSU-A instrument, per STD-2454.

4.5 Test methods

4.5.1 Accept-reject criteria. The accept-reject criteria for each examination or test shall be as specified in the data sheets included in each phase of the applicable test procedure. The test results shall be recorded on the data sheets to demonstrate compliance with the applicable specification requirements. Methods of analysis shall be appropriate for the parameters being inspected. It shall be the responsibility of Aerojet to review the test data and determine conformance of the unit under test to the performance requirements contained in S-480-80 and this specification.

In the event of a failure during any phase of this test procedure, the test activity shall record the required information on the Test Anomaly Record (TAR) and alert the design assurance and quality engineers. Except for failures which only represent a limited out-of-tolerance condition for a particular parameter and are not expected to interfere with the balance of the testing and which are non-destructive, the testing must be stopped until a complete description of the observed anomaly failure is documented and a Failure Analysis Strategy (FAS) is formulated, documented, and implemented to preclude loss of information or evidence that may facilitate determining the failure cause. The full set of data from the referenced tests is required in order to formulate a plan of action. The cognizant reliability engineer, quality assurance engineer, and the system or responsible test engineer shall jointly develop the FAS which must be approved by Design Assurance and Quality Assurance. Analysis and reporting shall be performed per Aerojet procedures.
4.5.2 **General.** All data sheets associated with the tests on the unit plus the data reduction and analysis of specific parameters required by each applicable test procedure obtained from screen printouts and plots, oscilloscope photographs, or magnetic recordings shall be included with the associated shop order. During tests in which a CRT screen is to be printed or plotted and retained as a data sheet, the following annotation shall be applied:

- **Test/Systems Engineer:**  
  (Signature)

- **Quality Control:**  
  (Signature)

- **Customer Representative**  
  (Flight Hardware Only):  
  (Signature)

- **Date:**

- **Test Paragraph No.:**

- **Subassembly/Assembly Serial No.:**

- **Shop Order No.:**

4.5.2.1 **Test data.** The test data shall be that which was obtained during performance of the tests specified and recorded on the Test Data Sheet(s) (TDS) (see Appendix A) and on printouts and plots and shall be attached to the shop order associated with the test.
5. PREPARATION FOR DELIVERY

This section is not applicable to this specification.

6. NOTES

6.1 Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMSU</td>
<td>Advanced Microwave Sounding Unit</td>
</tr>
<tr>
<td>ATB</td>
<td>Analog telemetry bus</td>
</tr>
<tr>
<td>AWG</td>
<td>American Wire Gage</td>
</tr>
<tr>
<td>BP</td>
<td>Beam Position</td>
</tr>
<tr>
<td>CAL</td>
<td>Calibrate</td>
</tr>
<tr>
<td>CPT</td>
<td>Comprehensive performance test</td>
</tr>
<tr>
<td>d</td>
<td>delta</td>
</tr>
<tr>
<td>DC</td>
<td>Direct current</td>
</tr>
<tr>
<td>DVM</td>
<td>Digital volt meter</td>
</tr>
<tr>
<td>EMI</td>
<td>Electromagnetic interference</td>
</tr>
<tr>
<td>ESD</td>
<td>Electrostatic Sensitive Device</td>
</tr>
<tr>
<td>EXT</td>
<td>External</td>
</tr>
<tr>
<td>FAS</td>
<td>Failure analysis strategy</td>
</tr>
<tr>
<td>GHz</td>
<td>Gigahertz</td>
</tr>
<tr>
<td>GIIS</td>
<td>General Instrument Interface Specification</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>GSE</td>
<td>Ground Support Equipment</td>
</tr>
<tr>
<td>HTR</td>
<td>Heater</td>
</tr>
<tr>
<td>kHz</td>
<td>Kilohertz</td>
</tr>
<tr>
<td>LPT</td>
<td>Limited performance test</td>
</tr>
<tr>
<td>LSB</td>
<td>Least significant bit</td>
</tr>
<tr>
<td>MA</td>
<td>Milliampere</td>
</tr>
<tr>
<td>METSAT</td>
<td>Meteorological Satellite</td>
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<tr>
<td>MLB</td>
<td>Main load bus</td>
</tr>
<tr>
<td>MFG</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>MMW</td>
<td>Millimeter wave</td>
</tr>
<tr>
<td>MS, MSEC</td>
<td>Millisecond</td>
</tr>
<tr>
<td>MSB</td>
<td>Most significant bit</td>
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<tr>
<td>MV</td>
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<tr>
<td>NEAT</td>
<td>Noise equivalent delta temperature</td>
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<td>PFM</td>
<td>Protoflight Model</td>
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<td>Pulse load bus</td>
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<tr>
<td>PLL</td>
<td>Phase lock loop</td>
</tr>
<tr>
<td>PLLO</td>
<td>Phase lock loop oscillator</td>
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6.2 Changes. Because of the extensiveness of the changes since the previous issue, no marginal notations have been used to show where changes have been made.
# APPENDIX A

## TEST DATA SHEETS

### 10.1 Scope.

This appendix contains the test data sheets for all tests and inspections listed in section 3.

<table>
<thead>
<tr>
<th>TDS</th>
<th>Page</th>
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<tbody>
<tr>
<td>1</td>
<td>Grounding System Test</td>
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<td>2</td>
<td>+28 MLB During Turn-on Transient</td>
</tr>
<tr>
<td>3</td>
<td>+28 MLB Operating Power</td>
</tr>
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<td>4</td>
<td>+28 Pulse Load Bus</td>
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<tr>
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<td>+28 V Analog Telemetry Bus</td>
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<td>6</td>
<td>+10V Interface Bus Voltage</td>
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<tr>
<td>7</td>
<td>Power Input Test for LPT</td>
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<tr>
<td>8</td>
<td>1.248 MHz Clock Signal Verification</td>
</tr>
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<td>9</td>
<td>“C1” Shift Pulse Verification</td>
</tr>
<tr>
<td>10</td>
<td>“A1” Select Pulse Verification</td>
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<tr>
<td>11</td>
<td>“S Seconds” Frame Sync Pulse</td>
</tr>
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<td>Synchronization Signals Relationship</td>
</tr>
<tr>
<td>13</td>
<td>Commands and Digital-B Telemetry Verification</td>
</tr>
<tr>
<td>14</td>
<td>Scanner Commands Verification</td>
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<td>Scanner Commands Verification</td>
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<td>16</td>
<td>Scanner Commands Verification</td>
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<td>17</td>
<td>Scanner Positions Commands</td>
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<td>18</td>
<td>Digital-A Data Output Full Scan Mode Synch Sequence, Unit LD./Serial Number and Digital-B Serial Data Verification</td>
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<td>Reflector Positions Section [IV]</td>
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<td>Digital-A Data Output Radiometer Data Section [VI]</td>
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<td>Full Scan Mode Temperature Sensors Section [VI]</td>
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<td>Digital-A Data Output Warm Cal Mode Synch Sequence, Unit LD./Serial Number and Digital-B Serial Data Verification</td>
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<td>Reflector Position Warm Cal Mode Section [IV] and Reflector Position Nadir Mode Section [IV]</td>
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<td>Digital-A Data Output Warm Cal Mode Radiometer Data Section [VI]</td>
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<td>Warm Cal Mode Temperature Sensors Section [VI]</td>
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<tr>
<td>26</td>
<td>Digital-A Data Output Cold Cal Mode Synch Sequence, Unit LD./Serial Number and Digital-B Serial Data Verification</td>
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<td>27</td>
<td>Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], and Reflector Position Nadir Mode Section [IV]</td>
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<td>Digital-A Data Output Cold Cal Mode Radiometer Data Section [VI]</td>
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<td>Cold Cal Mode Temperature Sensors Section [VI]</td>
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<td>Digital-A Data Output Nadir Mode Synch Sequence, Unit LD./Serial Number and Digital-B Serial Data Verification</td>
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<td>31</td>
<td>Digital-A Data Output Nadir Mode Radiometer Data Section [VI]</td>
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<td>Nadir Mode Temperature Sensors Section [VI]</td>
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<td>Analog Telemetry Verification by Way of Connector J6</td>
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<td>Analog Telemetry Signals by Way of the SETE</td>
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<td>35</td>
<td>Integrate/ Hold and Dump Signal Verification</td>
</tr>
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<td>36</td>
<td>Integration Time (Analog Output) Verification</td>
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<td>PLL No. 1 Verification and PLL No. 2 Verification</td>
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<td>Digital-A/GSE Mode-1 Synch Sequence, Unit LD./Serial Number and Digital-B Serial Data Verification</td>
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<td>Reflecter Position</td>
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<td>Receiver Input Signals</td>
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<td>Radiometer “Relative” NEDT Verification</td>
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<td>51</td>
<td>Transient Susceptibility Test</td>
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<tr>
<td>52</td>
<td>Instrument Feedback Tests</td>
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<tr>
<td>53</td>
<td>Channel Identification Test</td>
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</table>
## Grounding System Test (Paragraph 3.2.4.1)

**J1 of Spacecraft Interface**

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<tr>
<th>From Chassis Ground to</th>
<th>Pin Description</th>
<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1-1</td>
<td>+28 V MLB</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-2</td>
<td>+28 V MLB</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-3</td>
<td>+28 V MLB RTN</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-4</td>
<td>+28 V MLB RTN</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-5</td>
<td>+28 V PLB</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-6</td>
<td>+28 V PLB</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-7</td>
<td>+28 V PLB RTN</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-8</td>
<td>+28 V PLB RTN</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1-9</td>
<td>+28 V TMB</td>
<td>&gt; 100k</td>
<td></td>
<td></td>
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<td>J1-10</td>
<td>28 V TMB RTN</td>
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<td>J1-11</td>
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<td>J1-13</td>
<td>CHASSIS GROUND (E1)</td>
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<td>J1-15</td>
<td>+28 V MLB</td>
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<td>J1-16</td>
<td>+28 V MLB RTN</td>
<td>&gt; 100k</td>
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<td>J1-17</td>
<td>+28 V MLB RTN</td>
<td>&gt; 100k</td>
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<tr>
<td>J1-18</td>
<td>+28 V PLB</td>
<td>&gt; 100k</td>
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<td>J1-19</td>
<td>+28 V PLB</td>
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<td>J1-20</td>
<td>+28 V PLB RTN</td>
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<td>J1-21</td>
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<td>J1-22</td>
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<td>J1-23</td>
<td>28 V TMB RTN</td>
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<tr>
<td>J1-24</td>
<td>SAFETY HTR PWR</td>
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<tr>
<td>J1-25</td>
<td>SAFETY HTR RTN</td>
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</table>
## TEST DATA SHEET 1 (Sheet 2 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

### J2 of Spacecraft Interface

<table>
<thead>
<tr>
<th>From Chassis Ground to</th>
<th>Pin Description</th>
<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>J2-1</td>
<td>Chassis Ground (E2)</td>
<td>&lt; 1</td>
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<tr>
<td>J2-2</td>
<td>DATA CLOCK (C1)</td>
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</tr>
<tr>
<td>J2-3</td>
<td>Signal Return</td>
<td>&gt; 100k</td>
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<td></td>
</tr>
<tr>
<td>J2-4</td>
<td>No Connection</td>
<td>&gt; 100k</td>
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<td></td>
</tr>
<tr>
<td>J2-5</td>
<td>DIGITAL-A DATA OUT</td>
<td>&gt; 100k</td>
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<td></td>
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<tr>
<td>J2-6</td>
<td>DATA ENABLE (A1)</td>
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<tr>
<td>J2-7</td>
<td>8 SEC SYNC PULSE</td>
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<td></td>
</tr>
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<td>J2-8</td>
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<td>J2-9</td>
<td>No Connection</td>
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### J3 of Spacecraft Interface

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<th>From Chassis Ground to</th>
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<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
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<tbody>
<tr>
<td>J3-1</td>
<td>1.248 MHz CLK</td>
<td>&gt; 100k</td>
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<td></td>
</tr>
<tr>
<td>J3-2</td>
<td>1.248 MHz CLK RTN</td>
<td>&gt; 100k</td>
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<td></td>
</tr>
<tr>
<td>J3-3</td>
<td>Chassis GND (E3)</td>
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### J5 of Spacecraft Interface

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<th>Required Resistance (Ohms)</th>
<th>Measured Value (Ohms)</th>
<th>Pass/Fail</th>
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<td>Chassis Ground (E5)</td>
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<td>J5-2</td>
<td>MODULE PWR IND</td>
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<td></td>
</tr>
<tr>
<td>J5-3</td>
<td>COLD CAL POS MSB (OUT)</td>
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<tr>
<td>J5-4</td>
<td>No Connection</td>
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<td>J5-5</td>
<td>SCANNER A1-2 ON/OFF</td>
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<td>J5-6</td>
<td>ANT IN COLD CAL POS</td>
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<td>J5-7</td>
<td>PLL PRI/RED</td>
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<td>J5-8</td>
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<tr>
<td>J5-9</td>
<td>SURV HTR ON/OFF</td>
<td>&gt; 100k</td>
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<td>J5-10</td>
<td>No Connection</td>
<td>&gt; 100k</td>
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<tr>
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## TEST DATA SHEET 1 (Sheet 5 of 9)
Grounding System Test (Paragraph 3.2.4.1)

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## Grounding Interface Test (Paragraph 3.2.4.1)

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## TEST DATA SHEET 1 (Sheet 9 of 9)

**Grounding Interface Test (Paragraph 3.2.4.1)**

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<td>PLL PRI LOCK DETECT</td>
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<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-27</td>
<td>J4-13</td>
<td>A1-2 DRIVE MTR Curr</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-28</td>
<td>J4-13</td>
<td>+15 VDC ANT DRIVE MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-29</td>
<td>J4-13</td>
<td>+15 VDC SIG PROC MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-30</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH4 MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-31</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH6 MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-32</td>
<td>J4-13</td>
<td>L.O. VOLTAGE CH8 MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-33</td>
<td>J4-13</td>
<td>+15 VDC PLL LO MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
<tr>
<td>J6-34</td>
<td>J4-13</td>
<td>IF AMP MON</td>
<td></td>
<td>&gt; 2k</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test:  CPT    LPT

**METSAT/AMSU-A1 System P/N IS-1331720**

Shop Order: _______    S/N: _______

Test Systems Engineer: _______    Date: _______

Customer Representative (Flight Hardware Only)

Date: _______    Quality Control: _______    Date: _______
### TEST DATA SHEET 2
+28 MLB During Turn-on Transient (Paragraph 3.2.4.2.1.1)

At 28.56 Vdc:

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required*</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>ms</td>
<td>S/N 101-104: 20 ms max</td>
</tr>
<tr>
<td>8</td>
<td>Peak Current</td>
<td>Amps</td>
<td>10.6 Amps</td>
</tr>
<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>mA/μs</td>
<td>677 mA/μs</td>
</tr>
</tbody>
</table>

At 27.44 Vdc:

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required*</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>ms</td>
<td>S/N 101-104: 20 ms max</td>
</tr>
<tr>
<td>8</td>
<td>Peak Current</td>
<td>Amps</td>
<td>10.6 Amps</td>
</tr>
<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>mA/μs</td>
<td>677 mA/μs</td>
</tr>
</tbody>
</table>

At 28.00 Vdc:

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required*</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Time to reach steady state current</td>
<td>ms</td>
<td>S/N 101-104: 20 ms max</td>
</tr>
<tr>
<td>8</td>
<td>Peak Current</td>
<td>Amps</td>
<td>10.6 Amps</td>
</tr>
<tr>
<td>10</td>
<td>Rate of Change (Slope): dI/dT</td>
<td>mA/μs</td>
<td>677 mA/μs</td>
</tr>
</tbody>
</table>

* Refer to Figure 5.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: __________ S/N: __________

Test Systems Engineer: __________ Date: __________

Customer Representative (Flight Hardware Only): __________ Date: __________

Quality Control: __________ Date: __________
## TEST DATA SHEET 3

+28 MLB Operating Power (Paragraph 3.2.4.2.1.2)

<table>
<thead>
<tr>
<th>Step</th>
<th>+28V MLB at 27 Volts</th>
<th>Measured</th>
<th>Units</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+28 V MLB voltage at 27 V (V_b) (Measured)</td>
<td>Volts</td>
<td>27.0 ± 0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Average Current (I_v) (Plo #1)</td>
<td>Amps</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>+28 V MLB bus power = I_v x V_b (Plo #1)</td>
<td>Watts</td>
<td>82 W max</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+28 V MLB at 28 Volts

<table>
<thead>
<tr>
<th>Step</th>
<th>+28 V MLB Bus Voltage at 28 V (V_b) (Measured)</th>
<th>Volts</th>
<th>28.0 ± 0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Average Current (I_v) (Plo #1)</td>
<td>Amps</td>
<td>N/A</td>
</tr>
<tr>
<td>7</td>
<td>+28 V MLB operating power = I_v x V_b (Plo #1)</td>
<td>Watts</td>
<td>82 W max</td>
</tr>
</tbody>
</table>

+28 V MLB at 29 Volts

<table>
<thead>
<tr>
<th>Step</th>
<th>+28 V MLB voltage at 29 V (V_b) (Measured)</th>
<th>Volts</th>
<th>29.0 ± 0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Average Current (I_v) (Plo #1)</td>
<td>Amps</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>+28 V MLB operating power = I_v x V_b (Plo #1)</td>
<td>Watts</td>
<td>82 W max</td>
</tr>
</tbody>
</table>

### Notes

- **Average Current (I_v)**: Calculated from the measured voltage and current at each step.
- **Watts**: Calculated as the product of current and voltage.
- **Pass/Fail**: Determined based on whether the measured values meet the required specifications.

### Test Details

- **Circle Test**: CPT LPT
- **METSAT/AMSU-A1 System P/N**: IS-1331720
- **Shop Order**: ____________
- **S/N**: ____________
- **Test Systems Engineer**: ____________
- **Date**: ____________
- **Quality Control**: ____________
- **Date**: ____________

### Other Information

- **Customer Representative (Flight Hardware Only)**: ____________
- **Date**: ____________
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Parameter</th>
<th>Measured or Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.2.1</td>
<td>From -0.1 to two seconds</td>
<td></td>
<td>1.3 amps max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak Current = ( I_p )</td>
<td>__Amps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.2</td>
<td>From 2 to 4 seconds</td>
<td></td>
<td>1.3 amps max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak Current = ( I_p )</td>
<td>__Amps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.3</td>
<td>From 4 to 6 seconds</td>
<td></td>
<td>1.3 amps max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak Current = ( I_p )</td>
<td>__Amps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.4</td>
<td>From 6 to 8 seconds</td>
<td></td>
<td>1.3 amps max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak Current = ( I_p )</td>
<td>__Amps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.5</td>
<td>Eight Sec. Integrated Current Measurement:</td>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current</td>
<td>__mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.6</td>
<td>Turn-on Transient:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( dI/dT )</td>
<td>__mA/\mu s</td>
<td>744 mA/\mu s *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak Current = ( I_p )</td>
<td>__Amps</td>
<td>11.5 Amps</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 9.

Bus current during the I/H, D period

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Parameter</th>
<th>Measured or Calculated</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.2.1</td>
<td>From -0.1 to 2 secs</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2.2</td>
<td>From 2 to 4 secs</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2.3</td>
<td>From 4 to 6 secs</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2.4</td>
<td>From 6 to 8 secs</td>
<td>mA</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _________  S/N: _________

Test Systems Engineer  Date

Customer Representative  Date  (Flight Hardware Only)

Quality Control  Date
Bus current during warm cal, cold cal & Nadir

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Parameter</th>
<th>Measured or Calculated</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.2 (2)</td>
<td>Warm cal</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2 (3)</td>
<td>Cold cal</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2 (4)</td>
<td>Nadir</td>
<td>mA</td>
<td>N/A</td>
</tr>
<tr>
<td>3.2.4.2.2 (5)</td>
<td>WARM CAL (MOTORS OFF)</td>
<td>mA</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Circle Test: CPT   LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _______  S/N: _______

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date Quality Control Date
## TEST DATA SHEET 5

+28 V Analog Telemetry Bus (Paragraph 3.2.4.2.3)

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>+28 V ATB Bus Voltage ($V_{at}$) (Measured)</td>
<td></td>
<td>28.0 ±0.5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Av. Current ($I_a$)</td>
<td></td>
<td>7 mA max</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>+28 V ATB Operating Power = $I_a \times V_{at}$</td>
<td></td>
<td>200 mW max</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer Date

Customer Representative Date (Flight Hardware Only) Quality Control Date
### TEST DATA SHEET 6
+10 V Interface Bus Voltage (Paragraph 3.2.4.2.4)

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Av. Current ( (I_a) )</td>
<td>( mA )</td>
<td>( 10 \ mA ) max</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>+10 V Interface Bus ( (V_{ib}) ) (Measured)</td>
<td>( Volts )</td>
<td>( 9.0 \pm 1.0 \ Volts )</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>+10 V Interface Bus Power = ( I_a \times V_{ib} )</td>
<td>( mW )</td>
<td>( 100 \ mW ) max</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _________  S/N: _________

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date  Quality Control  Date
# TEST DATA SHEET 7

Power Input Test for LPT (Paragraph 3.2.4.2.5)

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured</th>
<th>Units</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>+28 V MLB Voltage (Vb)</td>
<td></td>
<td>Volts</td>
<td>28 ±0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Measured at connector J1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Current</td>
<td></td>
<td>Amps</td>
<td>Between 0.5 and 4.3 Amps</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test:  CPT    LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order:  S/N:  

Test Systems Engineer  Date

Customer Representative  Date  Quality Control  Date
(Flight Hardware Only)
### 1.248 CLOCK SIGNAL

**ATTACH PHOTOGRAPH OR PLOT HERE**

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Clock Frequency</td>
<td>_____ MHz</td>
<td>1.248 ±10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clock Amplitude</td>
<td>_____ Volts</td>
<td>9.0 ±1.0 V</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-AI System P/N IS-1331720

Shop Order: _______  S/N: _______

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date  Quality Control  Date
"C1" SHIFT PULSE
Attach Photograph OR Plot Here

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured/Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Timing (A) *</td>
<td>___μs</td>
<td>48 μs ± 10%</td>
<td></td>
</tr>
<tr>
<td>Pulse Timing (B) *</td>
<td>___μs</td>
<td>12 μs ± 10%</td>
<td></td>
</tr>
<tr>
<td>Pulse Amplitude</td>
<td>___Volts</td>
<td>9.0 ± 1.0 V</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 13 for location of the pulse timing A and B.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order:       S/N:       

Test Systems Engineer  Date

Customer Representative
(Flight Hardware Only)  Date

Quality Control  Date
**TEST DATA SHEET 10**

"AI" Select Pulse Verification (Paragraph 3.2.4.3.2.3)

"AI" SELECT PULSE
Attach Photograph or Plot Here

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Pulse Timing (F) *</td>
<td>_____ µs</td>
<td>961.5 µs ± 10%</td>
<td></td>
</tr>
<tr>
<td>Select Pulse Amplitude</td>
<td>_____ Volts</td>
<td>9.0 ±1.0 V</td>
<td></td>
</tr>
</tbody>
</table>

*Refer to Figure 13 for location of the pulse timing F*

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _______  S/N: _______

Test Systems Engineer  Date

Customer Representative  Date
(Flight Hardware Only)  Quality Control  Date
"8 SECONDS" FRAME SYNC PULSE  
Attach Photograph or Plot Here  
(Record of "C" timing only is required)

<table>
<thead>
<tr>
<th>Step</th>
<th>Parameter</th>
<th>Measured/ Calculated</th>
<th>Required</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Frame Sync Pulse Timing (G)*</td>
<td>__ Sec</td>
<td>8 Sec ±10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frame Sync Pulse Timing (C)*</td>
<td>__ µs</td>
<td>240.4 µs ±10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frame Sync Pulse Amplitude</td>
<td>__ Volts</td>
<td>9.0 ±1.0 V</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 13 for location of the timing pulses for G and C.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720

Test Systems Engineer __________ Date __________

Customer Representative
(Flight Hardware Only) Date __________ Quality Control __________ Date __________
A1 Select pulse and the 8 seconds Frame sync pulse.

Verify that the sync pulse between H and C is as shown in Figure 19.

TIME MEASURED: _________
TIME REQUIRED: 1.2 ms ±10%
PASS/FAIL _____________________

Circle Test: CPT  LPT
METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _________  S/N: _________

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date  Quality Control  Date
A1 Select pulse and the C1 Shift pulse.

Verify that the sync pulse between I and E is as shown in Figure 19.

TIME MEASURED: ____________

TIME REQUIRED: 24 μs ±1 μs

PASS/FAIL ___________________

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _____ S/N: _____

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date Quality Control Date
A1 Select pulse and the 1.248 MHz clock.

Verify that the sync pulse between I and J is as shown in Figure 19.

PASS/FAIL

ATTACH PHOTOGRAPH OR PLOT HERE

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _____ S/N: _____

Test Systems Engineer Date

Customer Representative Date (Flight Hardware Only)

Quality Control Date
# TEST DATA SHEET 14

Commands and Digital-B Telemetry Verification (Paragraphs 3.2.4.3.3.1, 3.2.4.3.3.2, 3.2.4.3.3.3, and 3.2.4.3.3.4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Digital-B Commands Verification Via STE</th>
<th>Visual Inspection</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Command</td>
<td>Observed</td>
<td>Required</td>
</tr>
<tr>
<td>3.2.4.3.3.1</td>
<td>Module Totally Off</td>
<td>Scanner A1-1</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scanner A1-2</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Module Power</td>
<td>Disconnect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Survival Htr. Power.</td>
<td>OFF</td>
</tr>
<tr>
<td>3.2.4.3.3.2</td>
<td>Survival Heater ON</td>
<td>Survival Heater ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Survival Heater OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>3.2.4.3.3.3</td>
<td>Module Power Connect</td>
<td>Module Power</td>
<td>Connect</td>
</tr>
<tr>
<td>3.2.4.3.3.4</td>
<td>PLL#2</td>
<td>PLLO#2</td>
<td>N/A</td>
</tr>
<tr>
<td>PLL Power</td>
<td>PLLO#1</td>
<td>PLLO#1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N: 

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
TEST DATA SHEET 15
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 1)

<table>
<thead>
<tr>
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<th>Digital &quot;B&quot; Verification</th>
<th>Command</th>
<th>Observed</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
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<td></td>
<td></td>
<td>CONNECT</td>
<td></td>
</tr>
<tr>
<td>2 Survival Heater</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3 Scanner A1 Power</td>
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<td></td>
<td></td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>4 Scanner A2 Power</td>
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<td></td>
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</tr>
<tr>
<td>5 Antenna Warm Cal Pos.</td>
<td></td>
<td></td>
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<td>NO</td>
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<tr>
<td>6 Antenna Cold Cal Pos.</td>
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<td></td>
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<td>NO</td>
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</tr>
<tr>
<td>7 Antenna NADIR Position</td>
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<td></td>
<td>NO</td>
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</tr>
<tr>
<td>8 Antenna Full Scan</td>
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<td></td>
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<td>PLL#1</td>
<td></td>
</tr>
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<td>9 PLL Power</td>
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<td>PLL#1</td>
<td>PLL#1</td>
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</tr>
<tr>
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<tr>
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Circle Test: CPT LPT

METSSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date Quality Control Date
## TEST DATA SHEET 16
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 2)

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<td>CONNECT</td>
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<td>Survival Heater</td>
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<td>3</td>
<td>Scanner A1 Power</td>
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<td>4</td>
<td>Scanner A2 Power</td>
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<tr>
<td>6</td>
<td>Antenna Cold Cal Pos.</td>
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<td>7</td>
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<td>8</td>
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<td>PLLO#1</td>
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<td>11</td>
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Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _______  S/N: _______

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date
### TEST DATA SHEET 17
Scanner Commands Verification (Paragraph 3.2.4.3.5, Step 3)

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<th>Command</th>
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<th>Required</th>
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<td>CONNECT</td>
</tr>
<tr>
<td>2 Survival Heater</td>
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<td>3 Scanner A1 Power</td>
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<td>5 Antenna Warm Cal Pos.</td>
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<tr>
<td>6 Antenna Cold Cal Pos.</td>
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<td>7 Antenna NADIR Position</td>
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<tr>
<td>8 Antenna Full Scan</td>
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<td>9 PLL Power</td>
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<td>PLLO#1</td>
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<td>11 Cold LSB</td>
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Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order:       S/N:       

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
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</tr>
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<td>4-Cold Cal. Pos.</td>
<td>MSB</td>
<td>1</td>
</tr>
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<td>5-Cold Cal. Pos.</td>
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<td>6-NADIR</td>
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<tr>
<td>7-Warm Cal</td>
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<td>YES</td>
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Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
**TEST DATA SHEET 19**
Digital-A Data Output Full Scan Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

<table>
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<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
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<td>Sync Sequence Byte 1</td>
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<tr>
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<td>0002</td>
<td>Sync Sequence Byte 2</td>
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<td>0003</td>
<td>Sync Sequence Byte 3</td>
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<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial Number</td>
<td>*</td>
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<tr>
<td>[III]</td>
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<td>0006</td>
<td>Digital-B Data Byte 2</td>
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<td>0007</td>
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* AMSU A1 Identification Words (data entered in decimal system)

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</table>

** Required value = 14 when PLLO #1 is active; and = 6 when PLLO #2 is active.

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
### TEST DATA SHEET 20

Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

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<th>A1-2 Reflector</th>
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</thead>
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<td>Required**</td>
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- Actual counts from computer printout. Rewriting counts on this data sheet is optional.
- Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _________  S/N: _________

Test Systems Engineer  Date

Customer Representative  Date  (Flight Hardware Only)

Quality Control  Date
### TEST DATA SHEET 21

Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

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</table>

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required = 16,500 ± 4000 counts.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: ___________  S/N: ___________

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date

A-32
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<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
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<td>25 ± 15</td>
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</tr>
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</table>

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** For S/N 101 through 104.
*** For S/N 105 and up.

(Continued on Sheet 2)
### Thermistor Sensors

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<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
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<th>Pass/Fail</th>
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<td>Feed Horn A1-2</td>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** = Count of 24,552 +1765,-1308.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
## TEST DATA SHEET 23

Digital-A Data Output Warm Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.2)

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<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
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<td>[I]</td>
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<td>Sync Sequence Byte 1</td>
<td>255</td>
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<tr>
<td></td>
<td>0002</td>
<td>Sync Sequence Byte 2</td>
<td>255</td>
<td></td>
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<td></td>
<td>0003</td>
<td>Sync Sequence Byte 3</td>
<td>255</td>
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<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial N</td>
<td>*</td>
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<td>[III]</td>
<td>0005</td>
<td>Digital-B Data Byte 1</td>
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<td>0006</td>
<td>Digital-B Data Byte 2</td>
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<td>Digital-B Data Byte 3</td>
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<td>0008</td>
<td>Digital-B Data Byte 4</td>
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* AMSU A1 Identification Words (data entered in decimal system)

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<th>Binary</th>
<th>Decimal</th>
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<td>AMSU-A1 S/N 103</td>
<td>00000101</td>
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<td>AMSU-A1 S/N 107</td>
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Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: __________  S/N: __________

Test Systems Engineer  Date

Customer Representative  Date  (Flight Hardware Only)

Quality Control  Date
### TEST DATA SHEET 24

Reflector Position Warm Cal Mode Section [IV] and Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2 and 3.2.4.3.4.4)

<table>
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| WC = Warm Cal |
| 15 = Nadir Position |

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<th>BP</th>
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</table>

WC = Warm Cal  
15 = Nadir Position

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

---

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: _____ S/N: _____

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date
TEST DATA SHEET 25
Digital-A Data Output Warm Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.2)

<table>
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<td>0086</td>
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<td>10</td>
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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

Circle Test: CPT LPT
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N:
Test Systems Engineer Date

Customer Representative Date Quality Control Date
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<th>Pass/Fail</th>
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<td>1094</td>
<td>A1-1 Warm Load 3</td>
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<td>1096</td>
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</tr>
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<tr>
<td>1118</td>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.
** For S/N 101 through 104.
*** For S/N 105 and up.

(Continued on Sheet 2)
### TEST DATA SHEET 26 (Sheet 2 of 2)
Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

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<th>Description</th>
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<th>Required Value (deg. C)</th>
<th>Pass/ Fail</th>
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<tbody>
<tr>
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<td>I.F. Amp. Channel 11-14</td>
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<td>25 ± 15</td>
<td></td>
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<td>I.F. Amp. Channel 10</td>
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<td>25 ± 15</td>
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<tr>
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<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1146</td>
<td>DC/DC Converter</td>
<td></td>
<td>25 ± 15</td>
<td></td>
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<tr>
<td>1148</td>
<td>I.F. Amp. Channel 13</td>
<td></td>
<td>25 ± 15</td>
<td></td>
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<tr>
<td>1150</td>
<td>I.F. Amp. Channel 14</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1152</td>
<td>I.F. Amp. Channel 12</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1154</td>
<td>RF Shelf A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1156</td>
<td>RF Shelf A1-2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1158</td>
<td>Detector Preamp Assy.</td>
<td></td>
<td>25 ± 15</td>
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<tr>
<td>1160</td>
<td>Scan Motor A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
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<tr>
<td>1162</td>
<td>Scan Motor A1-2</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1164</td>
<td>Feed Horn A1-1</td>
<td></td>
<td>25 ± 15</td>
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<tr>
<td>1166</td>
<td>Feed Horn A1-2</td>
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<td>25 ± 15</td>
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<tr>
<td>1168</td>
<td>R.F. Mux A1-1</td>
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<td>25 ± 15</td>
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<td>1170</td>
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<td>1172</td>
<td>Local Oscillator Channel 3</td>
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<td>1176</td>
<td>Local Oscillator Channel 5</td>
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<tr>
<td>1178</td>
<td>Local Oscillator Channel 6</td>
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</tr>
<tr>
<td>1180</td>
<td>Temp Sensor Ref Voltage Count</td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** = Count of 24,552 +1765,-1308.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
## TEST DATA SHEET 27
Digital-A Data Output Cold Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.3)

<table>
<thead>
<tr>
<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>[I]</td>
<td>0001</td>
<td>Sync Sequence Byte 1</td>
<td></td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0002</td>
<td>Sync Sequence Byte 2</td>
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</tr>
<tr>
<td></td>
<td>0003</td>
<td>Sync Sequence Byte 3</td>
<td></td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial N</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>[III]</td>
<td>0005</td>
<td>Digital-B Data Byte 1</td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0006</td>
<td>Digital-B Data Byte 2</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0007</td>
<td>Digital-B Data Byte 3</td>
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<td>0</td>
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</tr>
<tr>
<td></td>
<td>0008</td>
<td>Digital-B Data Byte 4</td>
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</table>

* AMSU A1 Identification Words  
  (data entered in decimal system)

<table>
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<th>AMSU-A1 S/N 101</th>
<th>Binary</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>AMSU-A1 S/N 102</td>
<td>00001001</td>
<td>5</td>
</tr>
<tr>
<td>AMSU-A1 S/N 103</td>
<td>00010001</td>
<td>9</td>
</tr>
<tr>
<td>AMSU-A1 S/N 104</td>
<td>00011001</td>
<td>13</td>
</tr>
<tr>
<td>AMSU-A1 S/N 105</td>
<td>00100001</td>
<td>17</td>
</tr>
<tr>
<td>AMSU-A1 S/N 106</td>
<td>00101001</td>
<td>21</td>
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<tr>
<td>AMSU-A1 S/N 107</td>
<td>00110001</td>
<td>25</td>
</tr>
<tr>
<td>AMSU-A1 S/N 108</td>
<td>00111001</td>
<td>29</td>
</tr>
<tr>
<td>AMSU-A1 S/N 109</td>
<td>00100001</td>
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</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], and Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, and 3.2.4.3.4.4)

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>Para No. Position* Required** Pass/Fail</td>
</tr>
<tr>
<td>3.2.4.3.4.3, Step 4</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
</tr>
</tbody>
</table>

CC = Cold Cal

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

<table>
<thead>
<tr>
<th>3.2.4.3.4.3, Step 4, Substep</th>
<th>MSB</th>
<th>LSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>c.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>d.</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N: 

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date Quality Control Date
### TEST DATA SHEET 28 (Sheet 2 of 2)

Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], and Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, and 3.2.4.3.4.4)

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-2 Reflector</th>
<th>Position*</th>
<th>Required**</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>3.2.4.3.4.3, Step 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CC** = Cold Cal

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

### 3.2.4.3.4.3, Step 4

<table>
<thead>
<tr>
<th>Substep</th>
<th>MSB</th>
<th>LSB</th>
</tr>
</thead>
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<tr>
<td>a.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>c.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>d.</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _________ S/N: _________

Test Systems Engineer __________ Date _________

Customer Representative (Flight Hardware Only) Date _________

Quality Control __________ Date _________

A-42
**TEST DATA SHEET 29**

Digital-A Data Output Cold Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.3)

Condition: Cold Cal Position MSB=0 and Cold Cal Position LSB=0

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-2 Channel-3 (50.3 GHz)</th>
<th>A1-1 Channel-9 (57.290344 GHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Measured*</td>
</tr>
<tr>
<td>01</td>
<td>0018</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>0052</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>0086</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>0120</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>0154</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>0188</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>0222</td>
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<td>08</td>
<td>0256</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>0290</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0324</td>
<td></td>
</tr>
<tr>
<td>11</td>
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<td>12</td>
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<td>13</td>
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<td>14</td>
<td>0460</td>
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<tr>
<td>15</td>
<td>0494</td>
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</tr>
<tr>
<td>16</td>
<td>0528</td>
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<tr>
<td>17</td>
<td>0562</td>
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<tr>
<td>18</td>
<td>0596</td>
<td></td>
</tr>
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<td>19</td>
<td>0630</td>
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<tr>
<td>20</td>
<td>0664</td>
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<td>21</td>
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<td>22</td>
<td>0732</td>
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<tr>
<td>23</td>
<td>0766</td>
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<tr>
<td>24</td>
<td>0800</td>
<td></td>
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<tr>
<td>25</td>
<td>0834</td>
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<tr>
<td>26</td>
<td>0868</td>
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<tr>
<td>27</td>
<td>0902</td>
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<td>28</td>
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<td>30</td>
<td>1004</td>
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<tr>
<td>CC</td>
<td>1038</td>
<td></td>
</tr>
<tr>
<td>WC</td>
<td>1190</td>
<td></td>
</tr>
</tbody>
</table>

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

Circle Test:  CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order:  _________  S/N:  _________

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date

AE-26156/3B
10 Mar 99
# TEST DATA SHEET 30 (Sheet 1 of 2)

Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
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<td>1090</td>
<td>A1-1 Warm Load 1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1092</td>
<td>A1-1 Warm Load 2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1094</td>
<td>A1-1 Warm Load 3</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1096</td>
<td>A1-1 Warm Load 4</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1098</td>
<td>A1-1 Warm Load Center</td>
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<td>25 ± 15</td>
<td></td>
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<tr>
<td>1100</td>
<td>A1-2 Warm Load 1</td>
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<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1102</td>
<td>A1-2 Warm Load 2</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1104</td>
<td>A1-2 Warm Load 3</td>
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<tr>
<td>1106</td>
<td>A1-2 Warm Load 4</td>
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<tr>
<td>1108</td>
<td>A1-2 Warm Load Center</td>
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</tr>
<tr>
<td>1110</td>
<td>Local Oscillator Channel 7</td>
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<td>1112</td>
<td>Local Oscillator Channel 8</td>
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<td>25 ± 15</td>
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<tr>
<td>1114</td>
<td>Local Oscillator Channel 15</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1116</td>
<td>PLL LO #2 Channels 9-14</td>
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</tr>
<tr>
<td>1118</td>
<td>PLL LO #1 Channels 9-14</td>
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</tr>
<tr>
<td>1122</td>
<td>Mixer I.F. Amp. Channel 3</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1124</td>
<td>Mixer I.F. Amp. Channel 4</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1126</td>
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<td>1130</td>
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<td>25 ± 15</td>
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<tr>
<td>1132</td>
<td>Mixer I.F. Amp. Channel 8</td>
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<td>1136</td>
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</tbody>
</table>

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** For S/N 101 through 104.
*** For S/N 105 and up.

(Continued on Sheet 2)
TEST DATA SHEET 30 (Sheet 2 of 2)
Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1140</td>
<td>I.F. Amp. Channel 9</td>
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<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1142</td>
<td>I.F. Amp. Channel 10</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1144</td>
<td>I.F. Amp. Channel 11</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1146</td>
<td>DC/DC Converter</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1148</td>
<td>I.F. Amp. Channel 13</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1150</td>
<td>I.F. Amp. Channel 14</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1152</td>
<td>I.F. Amp. Channel 12</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1154</td>
<td>RF Shelf A1-1</td>
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<tr>
<td>1156</td>
<td>RF Shelf A1-2</td>
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<tr>
<td>1158</td>
<td>Detector Preamp Assy.</td>
<td></td>
<td>25 ± 15</td>
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<td>1160</td>
<td>Scan Motor A1-1</td>
<td></td>
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<tr>
<td>1162</td>
<td>Scan Motor A1-2</td>
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<td>1164</td>
<td>Feed Horn A1-1</td>
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<td>1166</td>
<td>Feed Horn A1-2</td>
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<tr>
<td>1168</td>
<td>R.F. Mux A1-1</td>
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<td>25 ± 15</td>
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<td>R.F. Mux A1-2</td>
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<tr>
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<td>Local Oscillator Channel 3</td>
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<tr>
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</tr>
</tbody>
</table>

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** = Count of 24,552 +1765,-1308.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N: 

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
# TEST DATA SHEET 31

Digital-A Data Output Nadir Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.4)

## Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.4)

<table>
<thead>
<tr>
<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
</tr>
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<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial N</td>
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<td>*</td>
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<td>[III]</td>
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* AMSU A1 Identification Words (data entered in decimal system) *

| AMSU-A1 S/N 101 | 00000001 | 1 |
| AMSU-A1 S/N 102 | 00000101 | 5 |
| AMSU-A1 S/N 103 | 00001001 | 9 |
| AMSU-A1 S/N 104 | 00001101 | 13|
| AMSU-A1 S/N 105 | 00010001 | 17|
| AMSU-A1 S/N 106 | 00010101 | 21|
| AMSU-A1 S/N 107 | 00011001 | 25|
| AMSU-A1 S/N 108 | 00011101 | 29|
| AMSU-A1 S/N 109 | 00100001 | 33|

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: ______  S/N: ______

Test Systems Engineer  Date

Customer Representative  (Flight Hardware Only)  Date

Quality Control  Date
# TEST DATA SHEET 32

Digital-A Data Output Nadir Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.4)

<table>
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<th>BP</th>
<th>A1-2 Channel-3 (50.3 GHz)</th>
<th>A1-1 Channel-9 (57.290344 GHz)</th>
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<tbody>
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<td>02</td>
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<td>10</td>
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<td>WC</td>
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* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts (Unless otherwise indicated).

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N:

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
## TEST DATA SHEET 33 (Sheet 1 of 2)

Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
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<td>1092</td>
<td>A1-1 Warm Load 2</td>
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<tr>
<td>1094</td>
<td>A1-1 Warm Load 3</td>
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<td>1096</td>
<td>A1-1 Warm Load 4</td>
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<td>1098</td>
<td>A1-1 Warm Load Center</td>
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<td>1100</td>
<td>A1-2 Warm Load 1</td>
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<td>1102</td>
<td>A1-2 Warm Load 2</td>
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<td>Mixer I.F. Amp. Channel 8</td>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.

** For S/N 101 through 104.

*** For S/N 105 and up.

(Continued on Sheet 2)
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<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
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<td>I.F. Amp. Channel 14</td>
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<td>RF Shelf A1-2</td>
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<td>Scan Motor A1-2</td>
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<td>1164</td>
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<td>1166</td>
<td>Feed Horn A1-2</td>
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<tr>
<td>1168</td>
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<tr>
<td>1170</td>
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<td>1174</td>
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<td>1176</td>
<td>Local Oscillator Channel 5</td>
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<td>25 ± 15</td>
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</tr>
<tr>
<td>1178</td>
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<td>1180</td>
<td>Temp Sensor Ref Voltage Count</td>
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* Value is from the STE printout sheets. Copying data to this sheet is optional.
** = Count of 24,552 +1765,-1308.

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ________ S/N: ________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
TEST DATA SHEET 34
Analog Telemetry Verification by Way of Connector J6 (Paragraph 3.2.4.3.5.1)

<table>
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<tr>
<th>From</th>
<th>Description</th>
<th>To</th>
<th>Measured (volts)</th>
<th>Required (volts)</th>
<th>Pass/Fail</th>
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</tr>
<tr>
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</tr>
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<td></td>
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</tr>
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<td>09</td>
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<td>J6-13 L.O. Voltage Channel 3</td>
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<td>J2-03</td>
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<td>00</td>
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<td>16</td>
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<tr>
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<tr>
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<td>J6-28 -15 V Antenna Drive</td>
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<tr>
<td>11</td>
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<tr>
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<tr>
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<td>J2-03</td>
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<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>J6-33 -15 V PLL LO Ch 9-14</td>
<td>J2-03</td>
<td></td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>J6-34 **</td>
<td>J2-03</td>
<td></td>
<td>3.5 ± 2 V</td>
<td></td>
</tr>
</tbody>
</table>

* +8.5 V PLL LO Ch 9-14 for S/N 101-104, +10V Mixer Amp for S/N 105 and above.
*** 4.5 ±0.5 when locked, 0.5 ±0.5 when unlocked or OFF. One must be locked.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ____________ S/N: ____________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
TEST DATA SHEET 35 (Sheet 1 of 2)
Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

<table>
<thead>
<tr>
<th>Description</th>
<th>(*)</th>
<th>Measured (Deg. C)</th>
<th>Required (Deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 A1-1 Scanner Motor</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>02 A1-2 Scanner Motor</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>03 A1-1 RF Shelf</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>04 A1-2 RF Shelf</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>05 A1-1 Warm Load</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>06 A1-2 Warm Load</td>
<td>Temp</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>07 Ant A1-1 Drv Motor Current</td>
<td></td>
<td>(mAmps)</td>
<td>125 mA (Max)</td>
<td></td>
</tr>
<tr>
<td>08 Ant A1-2 Drv Motor Current</td>
<td></td>
<td>(mAmps)</td>
<td>125 mA (Max)</td>
<td></td>
</tr>
</tbody>
</table>

(*) Data from the printout sheet. Rewriting data on this space is optional.

(Continued on sheet 2)

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: __________ S/N: __________
TEST DATA SHEET 35 (Sheet 2 of 2)
Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

<table>
<thead>
<tr>
<th>Description</th>
<th>(*)</th>
<th>Measured (volts)</th>
<th>Required (volts)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 Signal Processing</td>
<td></td>
<td>+15 V</td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>10 Antenna Drive</td>
<td></td>
<td>+15 V</td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>11 Signal Processing</td>
<td></td>
<td>-15 V</td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>12 Antenna Drive</td>
<td></td>
<td>-15 V</td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>13 Receiver</td>
<td></td>
<td>+8 V</td>
<td>8.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>14 Sig Processing</td>
<td></td>
<td>+5 V</td>
<td>5.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>15 Antenna Drive</td>
<td></td>
<td>+5 V</td>
<td>5.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>16 Phase Lock Loop Ch 9-14 (a)</td>
<td></td>
<td>+8.5 V</td>
<td>8.5 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>Receiver/Mixer IF (b)</td>
<td></td>
<td>+10 V</td>
<td>10.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>17 Phase Lock Loop Ch 9-14</td>
<td></td>
<td>+15 V</td>
<td>15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>18 Phase Lock Loop Ch 9-14</td>
<td></td>
<td>-15 V</td>
<td>-15.0 ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>19 L.O. #8</td>
<td>Ch-8</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>20 L.O. #7</td>
<td>Ch-7</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>21 L.O. #6</td>
<td>Ch-6</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>22 L.O. #3</td>
<td>Ch-3</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>23 L.O. #4</td>
<td>Ch-4</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>24 L.O. #5</td>
<td>Ch-5</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>25 PLL0 No. 2 Lock Detect</td>
<td></td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>26 PLL0 No. 1 Lock Detect</td>
<td></td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
<tr>
<td>27 L.O. #15</td>
<td>Ch-15</td>
<td></td>
<td>(**) ± 0.5 V</td>
<td></td>
</tr>
</tbody>
</table>

(*) Data from the printout sheet. Rewriting data on this space is optional.
(**) GDO voltages from the manufacturer data sheet for S/N 101-104; DRO CH3-8 10V, GDO CH15 15V for S/N 105 and above.
(***) Locked PLO voltage 0 to +15 V, other PLO voltage ±15.0 V; one must be locked for S/N 101-104. Locked PLO voltage 4.0±1.0 V, other PLO voltage 0.0±0.2 V, one must be locked for S/N 105 and above.
(a) For S/N 101 through 104. (b) For S/N 105 and up.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date Quality Control Date
### TEST DATA SHEET 36
Integrate/Hold and Dump Signal Verification (Paragraph 3.2.4.3.6.1)

**ATTACH PHOTOGRAPH OR PLOT HERE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope Channel-1: Integration/Hold</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Measured (A)*</td>
<td>ms</td>
<td>165 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td>Time Measured (B)*</td>
<td>ms</td>
<td>35 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td>Amplitude Measured</td>
<td>V</td>
<td>5.0 ± 0.2 V</td>
<td></td>
</tr>
<tr>
<td><strong>Scope Channel-2: Dump Signal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Measured (D)*</td>
<td>ms</td>
<td>9 ms to 15 ms</td>
<td></td>
</tr>
<tr>
<td>Amplitude Measured</td>
<td>ms</td>
<td>5.0 ± 0.2 V</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 2 for waveform configuration.

Circle Test:  

METSAT/AMSU-A1 System P/N IS-1331720  
Shop Order: __________  
S/N: __________

Test Systems Engineer  
Date

Customer Representative  
(Flight Hardware Only)  
Date

Quality Control  
Date
TEST DATA SHEET 37
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 03
Frequency: 50.3 GHz

INTEGRATION (X) *
Measured ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured ms
Required 9 ms to 15 ms
Pass/Fail

Channel 04
Frequency: 52.8 GHz

INTEGRATION (X) *
Measured ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured ms
Required 9 ms to 15 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: S/N:

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date

A-54
### TEST DATA SHEET 38
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>Integration (X)</th>
<th>Measured</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>53.596 GHz</td>
<td></td>
<td></td>
<td>165 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hold (B-D)</td>
<td></td>
<td>25 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dump (D)</td>
<td></td>
<td>9 ms to 15 ms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>Integration (X)</th>
<th>Measured</th>
<th>Required</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>54.4 GHz</td>
<td></td>
<td></td>
<td>165 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hold (B-D)</td>
<td></td>
<td>25 ms ± 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dump (D)</td>
<td></td>
<td>9 ms to 15 ms</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ________ S/N: ________

Test Systems Engineer | Date
----------------------|---
Customer Representative | Date
(Flight Hardware Only) | 

Quality Control | Date
TEST DATA SHEET 39
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 07
Frequency: 54.94 GHz

INTEGRATION (X) *
Measured ________ ms
Required 165 ms ± 10%
Pass/Fail ______

HOLD (B-D) *
Measured ________ ms
Required 25 ms ± 10%
Pass/Fail ______

DUMP (D) *
Measured ________ ms
Required 9 ms to 15 ms
Pass/Fail ______

Channel 08
Frequency: 55.5 GHz

INTEGRATION (X) *
Measured ________ ms
Required 165 ms ± 10%
Pass/Fail ______

HOLD (B-D) *
Measured ________ ms
Required 25 ms ± 10%
Pass/Fail ______

DUMP (D) *
Measured ________ ms
Required 9 ms to 15 ms
Pass/Fail ______

ATTACH PHOTOGRAPH OR PLOT HERE

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: __________ S/N: __________

Test Systems Engineer  Date

Customer Representative  (Flight Hardware Only)  Date

Quality Control  Date

A-56
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel ___09
Frequency: _______ 57.2903 GHz
INTEGRATION (X) *
Measured _______ ms
Required 165 ms ± 10%
Pass/Fail _______

HOLD (B-D) *
Measured _______ ms
Required 25 ms ± 10%
Pass/Fail _______

DUMP (D) *
Measured _______ ms
Required 9 ms to 15 ms
Pass/Fail _______

Channel ___10
Frequency: _______ 57.2903 GHz
INTEGRATION (X) *
Measured _______ ms
Required 165 ms ± 10%
Pass/Fail _______

HOLD (B-D) *
Measured _______ ms
Required 25 ms ± 10%
Pass/Fail _______

DUMP (D) *
Measured _______ ms
Required 9 ms to 15 ms
Pass/Fail _______

* Refer to Figure 2 for waveform configuration.

Customer Representative
(Flight Hardware Only) Date

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: _______ S/N: _______

Test Systems Engineer Date

Quality Control Date
TEST DATA SHEET 41
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

Channel ______ 11
Frequency: ______ 57.3903 GHz

INTEGRATION (X) *
Measured ______ ms
Required 165 ms ± 10%
Pass/Fail ______

HOLD (B-D) *
Measured ______ ms
Required 25 ms ± 10%
Pass/Fail ______

DUMP (D) *
Measured ______ ms
Required 9 ms to 15 ms
Pass/Fail ______

ATTACH PHOTOGRAPH OR PLOT HERE

Channel ______ 12
Frequency: ______ 57.3903 GHz

INTEGRATION (X) *
Measured ______ ms
Required 165 ms ± 10%
Pass/Fail ______

HOLD (B-D) *
Measured ______ ms
Required 25 ms ± 10%
Pass/Fail ______

DUMP (D) *
Measured ______ ms
Required 9 ms to 15 ms
Pass/Fail ______

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ______ S/N: ______

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
TEST DATA SHEET 42
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel 13
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured ms
Required 9 ms to 15 ms
Pass/Fail

Channel 14
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured ms
Required 165 ms ± 10%
Pass/Fail

HOLD (B-D) *
Measured ms
Required 25 ms ± 10%
Pass/Fail

DUMP (D) *
Measured ms
Required 9 ms to 15 ms
Pass/Fail

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N:

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control Date
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

Channel: 15
Frequency: 89 GHz

INTEGRATION (X) *
- Measured: _ms
- Required: 165 ms ± 10%
- Pass/Fail:

HOLD (B-D) *
- Measured: _ms
- Required: 25 ms ± 10%
- Pass/Fail:

DUMP (D) *
- Measured: _ms
- Required: 9 ms to 15 ms
- Pass/Fail:

* Refer to Figure 2 for waveform configuration.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ________ S/N: ________

Test Systems Engineer Date

Customer Representative Date (Flight Hardware Only)

Quality Control Date
<table>
<thead>
<tr>
<th>Component</th>
<th>Required</th>
<th>Pass/Fail</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLLO No. 1 dc Level</td>
<td></td>
<td></td>
<td>*-15 to +15 V dc level for S/N 101 - S/N 104, 4.0 ±1.0 V for S/N 105 and above.</td>
</tr>
<tr>
<td>PLLO No. 2 dc Level</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circle Test: **CPT**    **LPT**

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: _____    S/N: _____

Test Systems Engineer

Date

Customer Representative (Flight Hardware Only)

Date

Quality Control

Date
TEST DATA SHEET 45
Digital-A/GSE Mode-1 Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.7.2)

<table>
<thead>
<tr>
<th>Step</th>
<th>Element (For Ref)</th>
<th>Description</th>
<th>Recorded Value</th>
<th>Required Value</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>[I]</td>
<td>0001</td>
<td>Sync Sequence Byte 1</td>
<td></td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0002</td>
<td>Sync Sequence Byte 2</td>
<td></td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0003</td>
<td>Sync Sequence Byte 3</td>
<td></td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>[II]</td>
<td>0004</td>
<td>Unit I.D. and Serial N</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>[III]</td>
<td>0005</td>
<td>Digital-B Data Byte 1</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0006</td>
<td>Digital-B Data Byte 2</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0007</td>
<td>Digital-B Data Byte 3</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0008</td>
<td>Digital-B Data Byte 4</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

AMSU A1 Identification Words (data entered in decimal system)

<table>
<thead>
<tr>
<th>AMSU-A1 S/N 101</th>
<th>Binary</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>00000101</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>00001001</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>00001101</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>00010001</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>00010101</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>00011001</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>00011101</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>00100001</td>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: ________  S/N: ________

Test Systems Engineer  Date

Customer Representative (Flight Hardware Only)  Date

Quality Control  Date
### 3.2.4.3.7.2 Digital-A/GSE Mode-1 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Position*</td>
</tr>
<tr>
<td>06</td>
<td>0184</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>354</td>
<td></td>
</tr>
<tr>
<td>WC</td>
<td>694</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.4.3.7.3 Digital-A/GSE Mode-2 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Position*</td>
</tr>
<tr>
<td>01</td>
<td>0014</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.4.3.7.4 Digital-A/GSE Mode-3 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>Required**</td>
</tr>
<tr>
<td>****</td>
<td></td>
</tr>
</tbody>
</table>

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.
*** GSE Modes do not require verification or testing for PFM & FM modules
**** Observe that both A1-1 and A1-2 reflectors increment one step every 8 seconds.
### 3.2.4.3.7.5 Digital-A/GSE Mode-4 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Position*</td>
</tr>
<tr>
<td>30</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.4.3.7.6 Digital-A/GSE Mode-5 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Position*</td>
</tr>
<tr>
<td>06</td>
<td>0184</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.4.3.7.7 Digital-A/GSE Mode-7 Reflector Position Section [IV] ***

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element (For Ref)</td>
<td>Position*</td>
</tr>
<tr>
<td>06</td>
<td>0184</td>
<td></td>
</tr>
</tbody>
</table>

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required range for instrument serial number from TDS 6 of AE-26002/1 ±10 counts. Rewriting range on this data sheet is optional.

*** GSE Modes do not require verification or testing for PFM & FM modules
### TEST DATA SHEET 47

Digital-A/GSE Mode-1 Radiometer Data Section [V] (Paragraph 3.2.4.3.7.2)

<table>
<thead>
<tr>
<th>BP</th>
<th>A1-1 Reflector</th>
<th>A1-2 Reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Channel-3*</td>
<td>Required**</td>
</tr>
<tr>
<td>01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
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<tr>
<td>04</td>
<td></td>
<td></td>
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<tr>
<td>05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td></td>
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<tr>
<td>08</td>
<td></td>
<td></td>
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<tr>
<td>09</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
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<tr>
<td>12</td>
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<tr>
<td>13</td>
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<tr>
<td>15</td>
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<tr>
<td>16</td>
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<td>17</td>
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<td>26</td>
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<td>27</td>
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<tr>
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<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required = 16,500 ± 4000 counts.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order:   S/N:   

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1090</td>
<td>A1-1 Warm Load 1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1092</td>
<td>A1-1 Warm Load 2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1094</td>
<td>A1-1 Warm Load 3</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1096</td>
<td>A1-1 Warm Load 4</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1098</td>
<td>A1-1 Warm Load Center</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td>A1-2 Warm Load 1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1102</td>
<td>A1-2 Warm Load 2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1104</td>
<td>A1-2 Warm Load 3</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1106</td>
<td>A1-2 Warm Load 4</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1108</td>
<td>A1-2 Warm Load Center</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1110</td>
<td>Local Oscillator Channel 7</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1112</td>
<td>Local Oscillator Channel 8</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1114</td>
<td>Local Oscillator Channel 15</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1116</td>
<td>PLL LO #2 Channels 9-14</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1118</td>
<td>PLL LO #1 Channels 9-14</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1120</td>
<td>PLLO (Reference Oscillator)**</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not used ***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1122</td>
<td>Mixer I.F. Amp. Channel 3</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1124</td>
<td>Mixer I.F. Amp. Channel 4</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1126</td>
<td>Mixer I.F. Amp. Channel 5</td>
<td></td>
<td>25 ± 15</td>
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</tr>
<tr>
<td>1128</td>
<td>Mixer I.F. Amp. Channel 6</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1130</td>
<td>Mixer I.F. Amp. Channel 7</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1132</td>
<td>Mixer I.F. Amp. Channel 8</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1134</td>
<td>Mixer I.F. Amp. Channels 9-14</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1136</td>
<td>Mixer I.F. Amp. Channel 15</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
</tbody>
</table>

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** For S/N 101 through 104.
*** For S/N 105 and up.

(Continued on Sheet 2)
# TEST DATA SHEET 48 (Sheet 2 of 2)

## Digital-A/GSE Mode-I Temperature Sensors Section [VI] (Paragraph 3.2.4.3.7.2)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Recorded Value* (deg. C)</th>
<th>Required Value (deg. C)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1138</td>
<td>I.F. Amp. Channel 11-14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1140</td>
<td>I.F. Amp. Channel 9</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1142</td>
<td>I.F. Amp. Channel 10</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1144</td>
<td>I.F. Amp. Channel 11</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1146</td>
<td>DC/DC Converter</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1148</td>
<td>I.F. Amp. Channel 13</td>
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<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1150</td>
<td>I.F. Amp. Channel 14</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1152</td>
<td>I.F. Amp. Channel 12</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1154</td>
<td>RF Shelf A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1156</td>
<td>RF Shelf A1-2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1158</td>
<td>Detector Preamp Assy.</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1160</td>
<td>Scan Motor A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1162</td>
<td>Scan Motor A1-2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1164</td>
<td>Feed Horn A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1166</td>
<td>Feed Horn A1-2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1168</td>
<td>R.F. Mux A1-1</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1170</td>
<td>R.F. Mux A1-2</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1172</td>
<td>Local Oscillator Channel 3</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1174</td>
<td>Local Oscillator Channel 4</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1176</td>
<td>Local Oscillator Channel 5</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1178</td>
<td>Local Oscillator Channel 6</td>
<td></td>
<td>25 ± 15</td>
<td></td>
</tr>
<tr>
<td>1180</td>
<td>Temp Sensor Ref Voltage Count</td>
<td></td>
<td>**</td>
<td></td>
</tr>
</tbody>
</table>

* = Count of 24,552 +1765,-1308.

- Value is from the STE printout sheets. Copying data to this sheet is optional.
- Value is from the STE printout sheets. Copying data to this sheet is optional.

** Circle Test: CPT  LPT**

METSAT/AMSU-A1 System P/N IS-1331720

<table>
<thead>
<tr>
<th>Shop Order:</th>
<th>S/N:</th>
</tr>
</thead>
</table>

Test Systems Engineer

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
</table>

Customer Representative
(Flight Hardware Only)

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
</table>

Quality Control

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
</table>
TEST DATA SHEET 49
Receiver Input Signals (Paragraph 3.2.4.4.1)

<table>
<thead>
<tr>
<th>CH 9 through 14 PRT Temp (°C)</th>
<th>Measured Frequency</th>
<th>Requirements **</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLLO No. 1</td>
<td>PLO No. 1</td>
<td>Xtal *** Osc.</td>
<td>57290.334 MHz ± 50 kHz</td>
</tr>
<tr>
<td>PLLO No. 2</td>
<td>PLO No. 2</td>
<td>Xtal *** Osc.</td>
<td>57290.334 MHz ± 50 kHz</td>
</tr>
</tbody>
</table>

* Attach spectrum analyzer plots.
** = At 18°C
*** PRT not connected on S/N 105 and above.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: ___________ S/N: ___________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date

A-68
### Radiometer "Relative" NEAT Verification* (Paragraph 3.2.4.4.2.2)

Channels 3, 4, 5, 6, 7, 8, and 15. PLL No. 1 (Channels 9 through 14)

<table>
<thead>
<tr>
<th>Channel Number&gt;</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEΔT (Average of 5 data) Pass/Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.40</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Channel Number&gt;</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>NEΔT (Average of 5 data) Pass/Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>Channel Number&gt;</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>NEΔT (Average of 5 data) Pass/Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.40</td>
<td>0.60</td>
<td>0.80</td>
<td>1.20</td>
</tr>
<tr>
<td>Channel Number&gt;</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Average of 5 data) Pass/Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

** Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria

** For reference only

---

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: S/N:

Test Systems Engineer: Date

Customer Representative (Flight Hardware Only): Date

Quality Control: Date
PLLO No. 2 (Channels 9 through 14)

<table>
<thead>
<tr>
<th>Channel Number&gt;</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEΔT (Average of 5 data)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pass/Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.25</td>
<td>0.40</td>
<td>0.40</td>
<td>0.60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel Number&gt;</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEΔT (Average of 5 data)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pass/Fail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEΔT (Specified) K **</td>
<td>0.80</td>
<td>1.20</td>
</tr>
</tbody>
</table>

* Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria.
** For reference only.

Circle Test: CPT   LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: __________ S/N: __________

Test Systems Engineer ___________________ Date __________

Customer Representative (Flight Hardware Only) Date __________

Quality Control ___________________ Date __________

A-70
**TEST DATA SHEET 51 (Sheet 1 of 2)**

Transient Susceptibility Test (Paragraph 3.2.4.2.1.4, 3.2.4.2.3.3)

Test Setup Verified: ________

Signature

3.2.4.2.1.4: +28V Main Bus Load-Induced Transient Test

<table>
<thead>
<tr>
<th>Subpara</th>
<th>Step</th>
<th>Load Induced Transient</th>
<th>Functional Performance Results/Deviations</th>
<th>Comments/Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.1.4.2</td>
<td>8</td>
<td>Low frequency in accordance with Figure 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.1.4.3</td>
<td>10</td>
<td>High frequency</td>
<td>1.43 Hz 200 mV p-p</td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.1.4.3</td>
<td>10</td>
<td>High frequency</td>
<td>2.86 Hz 1.00 V p-p</td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.1.4.3</td>
<td>10</td>
<td>High frequency</td>
<td>6.67 Hz 1.50 V p-p</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: ________ S/N: ________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date
### TEST DATA SHEET 51 (Sheet 2 of 2)

Transient Susceptibility Test (Paragraph 3.2.4.2.1.4, 3.2.4.2.2.9, 3.2.4.2.3.3)

Test Setup Verified: ______________

**Signature**

#### 3.2.4.2.2.9: +28V Pulse Load Bus Load-Induced Transient Test

<table>
<thead>
<tr>
<th>Subpara</th>
<th>Step</th>
<th>Load Induced Transient</th>
<th>Functional Performance Results/Deviations</th>
<th>Comments/ Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.2.9.2</td>
<td>8</td>
<td>Low frequency in accordance with Figure 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.9.3</td>
<td>10</td>
<td>High frequency 1.43 Hz 200 mV p-p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.9.3</td>
<td>10</td>
<td>High frequency 2.86 Hz 1.00 V p-p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2.4.2.2.9.3</td>
<td>10</td>
<td>High frequency 6.67 Hz 1.50 V p-p</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 3.2.4.2.3.3: +28V Analog Telemetry Bus Load-Induced Transient Test

<table>
<thead>
<tr>
<th>Subpara</th>
<th>Step</th>
<th>Load Induced Transient</th>
<th>Functional Performance Results/Deviations</th>
<th>Comments/ Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4.2.3.3.2</td>
<td>8</td>
<td>Low frequency in accordance with Figure 16</td>
<td></td>
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<td>High frequency 1.43 Hz 200 mV p-p</td>
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<td>High frequency 2.86 Hz 1.00 V p-p</td>
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<td>High frequency 6.67 Hz 1.50 V p-p</td>
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Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: ________  S/N: ________

Test Systems Engineer  Date

Customer Representative  Date

Quality Control  Date

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### TEST DATA SHEET 52 (Sheet 1 of 2)

Instrument Feedback Tests (Paragraph 3.2.4.2.1.3, 3.2.4.2.2.8, 3.2.4.2.3.2, 3.2.4.2.4.2)

#### 3.2.4.2.1.3: +28V Main Bus Instrument Feedback Tests

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<th>Subpara</th>
<th>Step</th>
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<th>Measured Ripple (Peak-to-Peak) In mA</th>
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<td>Load current ripple</td>
<td>&lt;150 mA p-p</td>
<td>Value: ___</td>
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**NOTE:** Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720  Shop Order: __________  S/N: __________

Test Systems Engineer  

Customer Representative  
(Flight Hardware Only)  

Quality Control  

A-73
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<th>Channel Number</th>
<th>Antenna Location</th>
<th>Sweeper Freq. Setting (GHz)</th>
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<th>Radiometric Data Counts Δ Counts</th>
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Circle Test: CPT  LPT

METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: _____  S/N: _____

Test Systems Engineer  Date

Customer Representative  (Flight Hardware Only)  Date

Quality Control  Date
This is the Performance Verification Report, Final Comprehensive Performance Test Report, P/N 1331720-2-TST, S/N 105/A1, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).
**GENERAL INSTRUCTIONS FOR COMPLETING SF 298**

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filing in each block of the form follow. It is important to stay within the lines to meet optical scanning requirements.

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<th>Instructions</th>
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<td>2. Report Date</td>
<td>Full publication date including day, month, and year, if available (e.g., 1 Jan 88). Must cite at least the year.</td>
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<td>3. Type of Report and Dates Covered</td>
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<td>4. Title and Subtitle</td>
<td>A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, the primary title, add volume number and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.</td>
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<td>To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:</td>
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<td>Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).</td>
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<td>Final Comprehensive Performance Test Report, P/N 1331720-2-TST,</td>
<td>March 1999</td>
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(Data Center) FINAL

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