

**Report 11302
28 October 1998**

**Integrated Advanced Microwave Sounding Unit-A
(AMSU-A)**

Engineering Test Report

METSAT A1 Signal Processor (P/N: 1331670-2, S/N: F03)

**Contract No. NAS 5-32314
CDRL 207**

Submitted to:

**National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771**

Submitted by:

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TABLE OF CONTENTS

| | | |
|------------|----------------------------|----------|
| 1.0 | INTRODUCTION..... | 1 |
| 2.0 | OBJECTIVE | 1 |
| 3.0 | TEST DATA | 1 |
| 4.0 | TEST | 1 |
| 5.0 | TEST ANOMALIES..... | 5 |
| 6.0 | TEST RESULTS..... | 6 |

1.0 Introduction

This report presents a description of the tests performed, and the test data, for the A1 METSAT Signal Processor Assembly PN: 1331679-2, S/N F03. The assembly was tested in accordance with AE-26754, "METSAT Signal Processor Scan Drive Test and Integration Procedure".

The tests were conducted at room temperature in the AMSU-A test area of building 57. The tests fall into six categories: 1) Continuity, 2) Power Distribution, 3) Digital Processor, 4) Analog Processor, 5) Scan Drive, and 6) Supply Current.

2.0 Objective

The objective is to demonstrate functionality of the signal processor prior to instrument integration.

3.0 Test Data

All test data is presented on the enclosed copies of the test data sheets (TDSs) numbered TDS 1 through TDS 10 (Pages A-2 through A-14). Redlines to the data sheets were necessary and were accomplished in accordance with program directive No. 91. Each change was approved by Quality and the test engineer. Changes were made for the following reasons: 1) Test parameter limits were changed due to design changes in the instrument circuitry, 2) Addition of CCA serial number recording locations, and 3) Correction of a typing error. Also included with the test data sheets is the Manufacturing Assembly Instructions list of the CCA card cage slot assignment record listing each CCA part number and serial number.

4.0 TESTS

4.1 Continuity

A complete continuity test of the backplane wiring is performed at the facility where the wirewrapping of the backplane is done. The continuity tests performed here involve 1) the I/O interface card slots, J301 and J326, 2) the Aerojet added Pre-amp/detector signal cable and connector, 3) the Aerojet added Pre-amp/detector power cable and connector, and 4) chassis return connections. The tests are manual resistance measurements tests. Test data is presented on TDS 1.

4.2 Power Distribution

In these tests supply voltages are input to the signal processor from the Test Relay Unit (TRU) as in normal testing. No CCAs are installed in the signal processor for the tests. The test verifies that the four supply voltages are present on the proper pins of all backplane connectors. The test setup block diagram is shown in Figure 1, and test data is presented on TDS 2.

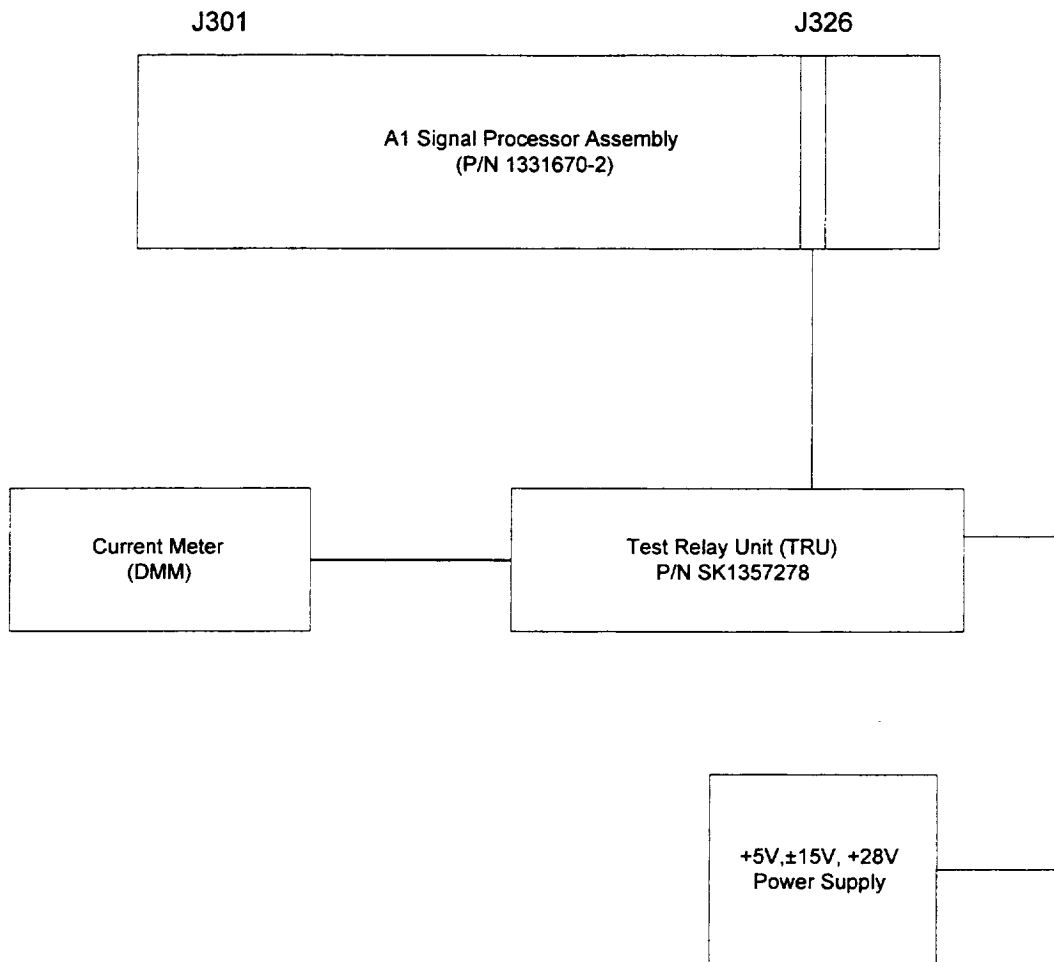


Figure 1. A1 Signal Processor Test Setup

4.3 Digital Processor

Beginning with this test, CCAs are installed into the card cage as required to perform the test, and then remain installed. At the conclusion of all tests, a complete set of CCAs has been installed. The complete test setup block diagram which is required for performing any of the tests is shown in Figure 2.

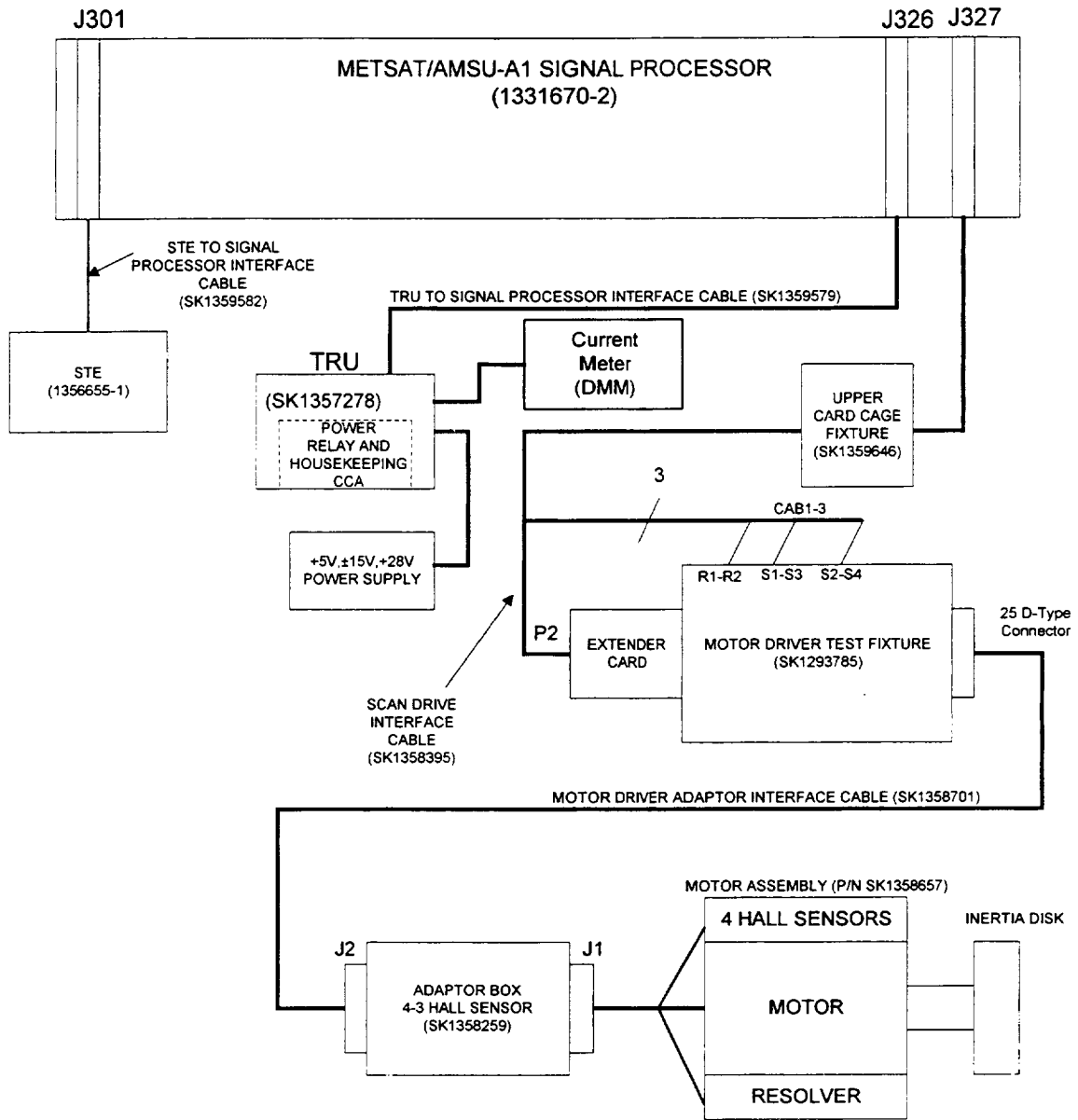


Figure 2 Scan Drive Test Set-Up

4.3.1 Memory

In this test, the digital test set is used in place of the CPU CCA to read and verify data of the test PROMs on the "GOLD" Memory CCA. Test data is presented on TDS 3.

4.3.2 CPU

The CPU test requires that the CPU Auxiliary test CCA be installed in place of the Memory CCA. In this test, the RAM and various instructions performed by the CPU are tested. In addition, the waveform of the clock signal to the DC-DC converter is measured at the CLOCK jack on the TRU. Test data is presented on TDS 3.

4.3.3 Scan Control Interface

In this test, input and output ports 0 through 3 are tested. In addition, the disable feature of the input ports is checked out. Test data is presented on TDS 3.

4.3.4 Timing and Control

In this test, the proper time intervals of I/H, DUMP, INTCMPL, TSCMPL, STOP, and ANTENNA STROBE are verified. In addition to the above tests, the test set also checks the input ports 16 and 17, output port #13 (4 MSBs), output port 14, input port #15 (DAC BSY signal), and output port #13 (4 LSBs). Test data is presented on TDS 3.

4.3.5 Spacecraft Interface

In this test, the STE is turned on and initialized. The STE is tested with a series of self-tests to verify the readiness of the STE to test flight hardware. After successfully passing the self-tests, the STE is used to simulate the spacecraft command signals and retrieve limited test data for the remaining signal processor tests. STE test data is presented on TDS 4.

4.3.6 Relay Control

This test verifies the operation of the module power command and the survival heater command. The presence of the +10 volt Interface power is verified. The PLO lock alarm signals, Scan 1 and 2 relay drive and position indicators, and PLO relay drive and relay position indicators are also verified. Test data is presented on TDS 4.

4.4 Analog Processor

4.4.1 Independence of Measurements

This test is performed using the Analog CCA Test Fixture, the Integrate and Dump Filter and the Analog Mux and A/D Converter CCAs. The test gives a measurement of the sample-to-sample crosstalk within a channel, which is dependent on the completeness of the dump of the integration capacitor. Test data is presented on TDS 5.

4.4.2 Integrate/dump filter, radiometric data multiplexing, and digitization tests

In this test, a 2 volt dc signal is input to each integrate and dump filter, and the channel output code from the A/D converter is measured. The integrator output waveform is also displayed on an oscilloscope for verification of timing. Test data is presented on TDS 6.

4.4.3 Temperature monitoring circuits

In this test a resistor of value approximating the room temperature resistance of the PRTs is connected at the input of each PRT readout circuit, and the output code from the A/D converter is measured. The reference voltage used in the PRT readout circuits is also measured. Test data is presented on TDS 7.

4.4.4 Analog telemetry

In this test each of the analog telemetry signals is measured at the ANALOG HSKP jack on the TRU. Test data is presented on TDS 8.

4.5 Scan Drive

This test includes all CCAs involved in the scan drive function. The circuitry is programmed to provide one complete revolution of the drive motor as it steps through each of the thirty scene positions and the two calibration positions. The circuitry is programmed to park at the Warm Cal, Cold Cal, and the Nadir positions during the test sequence. The GSE test modes are also verified. To verify proper performance, the inertia disk on the motor shaft is visually observed through the one revolution and the various calibration positions. Test data is presented on TDS 9.

4.6 Supply Current

In this test, the total current drawn by the signal processor from each of the four supply voltages is measured with the signal processor fully populated with CCA's. Test data is presented on TDS 10.

5.0 TEST ANOMALIES

No test anomalies occurred during the Signal Processor engineering tests.

6.0 TEST RESULTS

The METSAT/AMSU A1 SIGNAL PROCESSOR TEST was successfully completed and all test data is within specified limits.

F03

| | | | | | |
|-----------------------------|--|-----------------|--------------------------|----------------------------|--------------|
| GENCORP AEROJET | MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.) | | | PAGE | OF |
| | PART DESCRIPTION SIGNAL PROCESSING ASSY. | | PART NUMBER 1331670-2 | | 6 |
| PLANNED BY J. DIPASQUALE | | DATE 5/08/97 | REVISION 01 | NEXT ASSEMBLY 1331720-2 | |
| | | | | | OPER 0090 |



5. Record Serial Numbers of each CCA below.

- d) Record S/N of each CCA in the area noted below, also record S/N on the Data Sheet.
Note: CCA'S will be installed at Operation 0120 per AE-26002/3 Test Procedure.
- e) Record Part No. and S/N of CCA required, for location J317 Connector.

| LOCATION | ITEM # | CCA PART NO. | SERIAL NO. | DESCRIPTION | COMMENTS |
|----------|--------|--------------|------------|-----------------------|----------|
| J301 | | | | | |
| J302 | | | | | |
| J303 | 2 | 1338421-1 | F19 | TEMP. SENSOR A | |
| J304 | 3 | 1331682-1 | F289 | TEMP. SENSOR BD. "B" | |
| J305 | 3 | 1331682-1 | F32 | TEMP. SENSOR BD. "B" | |
| J306 | 4 | 1331688-1 | F16 | Temp.Sensor,ANLG MUX | |
| J307 | 5 | 1356418-1 | F04 | MUX AND ANLG/DGTL | |
| J308 | 6 | 1338424-1 | F16 | INTEG. & DUMP FILTER | |
| J309 | 6 | 1338424-1 | F19 | INTEG. & DUMP FILTER | |
| J310 | 6 | 1338424-1 | F27 | INTEG. & DUMP FILTER | |
| J311 | 6 | 1338424-1 | F37 | INTEG. & DUMP FILTER | |
| J312 | 7 | 1331147-1 | F19 | SPACECRAFT I/F NO.2 | |
| J313 | 8 | 1331144-1 | F19 | SPACECRAFT I/F NO.1 | |
| J314 | 9 | 1351150-1 | F22 | PARALLEL TO SER CNVTR | |
| J315 | 10 | 1331135-1 | F11 | TIMING AN CONTROL | |
| J316 | 11 | 1356413-2 | F02 | CPU | |
| J317 | 12 | *1331126-11 | F01 | MEMORY ASSY. | ** |
| J318 | 13 | 1331129-1 | F16 | SCAN CONTROL INTFC | |
| J319 | 40 | 1356911-1 | F01 | RELAY DRVR & CUR MON | |
| J320 | 14 | 1331697-1 | F27 | Interface/Converter | *** |
| J321 | 15 | 1334972-1 | F21 | RSLVR DATA ISOL | |
| J322 | 16 | 1337739-1 | F22 | R-D CONVERTER/OSC | *** |
| J323 | 14 | 1331697-1 | F34 | Interface/Converter | *** |
| J324 | 15 | 1334972-1 | F31 | RSLVR DATA ISOL | |
| J325 | 16 | 1337739-1 | F25 | R-D CONVERTER/OSC | *** |
| J326 | | | | | |
| J327 | | | | | |

* = See table #1 for selection of CCA required at this location.

** = Memory CCA installed at next assembly.

*** = Test and select resistors added at system level test.

Not Conformal Coated when installed at next assembly.

Figure #4

TEST DATA SHEET 1
A1 Continuity Tests (4.2.1)

| From | To | Signal Name | Pass/Fail |
|---------|---------|--------------------|-----------|
| J301-1 | P511-3 | CH 3 - IN | P |
| J301-10 | P511-13 | CH 8 - IN | P |
| J301-13 | P511-15 | CH 9 - IN | P |
| J301-15 | P511-17 | CH 10 - IN | P |
| J301-16 | P511-19 | CH 11 - IN | P |
| J301-19 | P511-21 | CH 12 - IN | P |
| J301-21 | P511-23 | CH 13 - IN | P |
| J301-22 | P511-25 | CH 14 - IN | P |
| J301-25 | P511-1 | CH 15 - IN | P |
| J301-3 | P511-5 | CH 4 - IN | P |
| J301-4 | P511-7 | CH 5 - IN | P |
| J301-60 | E1 | CHASSIS GND | P |
| J301-7 | P511-9 | CH 6 - IN | P |
| J301-9 | P511-11 | CH 7 - IN | P |
| J301-90 | E2 | CHASSIS GND | P |
| J304-43 | P512-5 | +15V(2) | P |
| J304-45 | P512-24 | +15V(2) | P |
| J304-46 | P512-9 | 15VRTN(2/3) | P |
| J304-48 | P512-29 | 15VRTN(2/3) | P |
| J304-49 | P512-14 | -15V(3) | P |
| J304-51 | P512-15 | -15V(3) | P |
| J305-68 | P512-12 | PRT35_HI (PRE AMP) | P |
| J305-72 | P512-11 | PRT35_LO (PRE AMP) | P |
| J326-76 | E3 | CHASSIS GND | P |

Assembly No. 1331670-2 Shop Order No. 543651

Serial No. F03 Pass Fail

Test Engineer D. Lusk 10/20/98 Quality Control [Signature] OCT 21 '98
(Signature) (Date) (Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 2
A1 Power Distribution (Paragraphs 4.2.2 & 4.2.3)

Power Supply Voltages:

+5.7 ± 0.1V: 5.672V
-15.7 ± 0.1V: -15.694V

+15.7 ± 0.1V: 15.683V
+28.7 ± 0.1V: 28.75V

Test Set-up Verified: YES NO

| Para. 4.2.3 Step No. | Connector No. | +5 ±0.5 V | P/F | +15 ±0.3V | P/F | -15 ±0.3V | P/F | +28 ±0.56V | P/F | +9 ±1V* | P/F |
|----------------------|---------------|-----------|-----|-----------|-----|-----------|-----|------------|-----|---------|-----|
| 7* | J301 | | | | | | | | | 9.4 | P |
| 1 | J303 | | | 14.98 | P | -15.01 | P | | | | |
| 2 | J304 | | | 14.98 | P | -15.00 | P | | | | |
| 3 | J305 | | | 14.98 | P | -15.00 | P | | | | |
| 4 | J306 | | | 14.98 | P | -15.00 | P | | | | |
| 5 | J307 | 4.95 | P | 14.98 | P | -15.00 | P | | | | |
| 5 | J308 | | | 14.98 | P | -15.00 | P | | | | |
| 5 | J309 | | | 14.98 | P | -15.00 | P | | | | |
| 5 | J310 | | | 14.98 | P | -15.00 | P | | | | |
| 5 | J311 | | | 14.98 | P | -15.00 | P | | | | |
| 5 | J312 | 4.95 | P | | | | | | | 9.4 | P |
| 5 | J313 | 4.95 | P | | | | | | | 9.4 | P |
| 5 | J314 | 4.95 | P | | | | | | | | |
| 5 | J315 | 4.95 | P | | | | | | | | |
| 5 | J316 | 4.95 | P | | | | | | | | |
| 5 | J317 | 4.95 | P | | | | | | | | |
| 5 | J318 | 4.95 | P | | | | | | | | |
| 5 | J319 | 4.95 | P | 14.98 | P | -15.01 | P | 28.05 | P | | |
| 5 | J320 | 4.96 | P | 14.98 | P | -15.01 | P | | | | |
| 5 | J321 | 4.96 | P | | | | | | | | |
| 5 | J322 | 4.96 | P | 14.98 | P | -15.00 | P | | | | |
| 5 | J323 | 4.96 | P | 14.98 | P | -15.01 | P | | | | |
| 5 | J324 | 4.96 | P | | | | | | | | |
| 5 | J325 | 4.96 | P | 14.98 | P | -15.01 | P | | | | |
| 6 | J327 | 4.96 | P | 14.98 | P | -15.01 | P | 28.09 | P | | |

*measured at paragraph 4.2.5.2. test

Assembly No. 1331670-2

Shop Order No. 543651

Serial No. F03

Pass Fail

Test Engineer [Signature] 10/20/98
(Signature) (Date)

Quality Control [Signature] oct 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 3 (Sheet 1 of 2)
A1 Digital Processor (Paragraph 4.2.4)

CPU CCA Serial No. (J316) F02
Scan Control Interface CCA Serial No. (J318) F16
Timing and Control CCA Serial No. (J315) F11

4.2.4.1 Memory tests:

4.2.4.1/10 Circle Pass or Fail to indicate the result of the tests :

Pass Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.2 CPU tests:

4.2.4.2/10

| | <u>Measurements</u> | <u>Limits</u> | <u>Pass/Fail</u> |
|------------------|---------------------------|---------------|------------------|
| V _{p-p} | <u>3.80V_{pp}</u> | 3.30 - 4.94 V | <u>P</u> |
| T | <u>801.25</u> | 761 - 841 ns | <u>P</u> |

4.2.4.2/19 Circle Pass or Fail to indicate the result of the CPU tests

Pass Fail

4.2.4.3 Scan Control Interface Tests:

4.2.4.3/16 The input ports 0 and 1 tests

Pass Fail

4.2.4.3/23 Inhibit input port 0 and 1 tests

Pass Fail

4.2.4.3/35 The input ports 2 and 3 tests

Pass Fail

4.2.4.3/48² Inhibit input port 2 and 3 tests

Pass Fail

4.2.4.3/55 The output ports 0 and 1 tests

Pass Fail

TEST DATA SHEET 3 (Sheet 2 of 2)
A1 Digital Processor (Paragraph 4.2.4)

4.2.4.3 Scan Control Interface Tests (Cont):

4.2.4.3/63 The output ports 2 and 3 tests

Pass Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.4 Timing and Control Tests:

- | | | | |
|------------|--|-------------|------|
| 4.2.4.4/13 | The Integrate and Hold pulse and the Dump pulse at the card rack slot J308. | <u>Pass</u> | Fail |
| 4.2.4.4/23 | The Integrate and Hold pulse and the Dump pulse at the card rack slot J309. | <u>Pass</u> | Fail |
| 4.2.4.4/33 | The Integrate and Hold pulse and the Dump pulse at the card rack slot J310. | <u>Pass</u> | Fail |
| 4.2.4.4/43 | The Integrate and Hold pulse and the Dump pulse at the card rack slot J311. | <u>Pass</u> | Fail |
| 4.2.4.4/54 | The Integrate and Hold pulse and the Dump pulse at the card rack slot J301. | <u>Pass</u> | Fail |
| 4.2.4.4/64 | The Antenna Strobe pulse test at J320. | <u>Pass</u> | Fail |
| 4.2.4.4/68 | The Antenna Strobe pulse test at J323. | <u>Pass</u> | Fail |
| 4.2.4.4/78 | The test of the interface to the Temp. Sensor Analog Mux card rack slot J306. | <u>Pass</u> | Fail |
| 4.2.4.4/89 | The test of the interface to the Analog Mux and Converter card rack slot J307. | <u>Pass</u> | Fail |

If "Fail", record error code and error description:

Error Code: N/A

Error Description: N/A

Assembly No. 1331670-2

Shop Order No. 543651

Serial No. F03

Pass Fail

Test Engineer [Signature] 10/20/98
(Signature) (Date)

Quality Control [Signature] Oct 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 4
A1 Relay Driver Tests (Paragraph 4.2.5.2)

Spacecraft Interface #2 CCA (J312) Ser. No. F19
 Spacecraft Interface #1 CCA (J313) Ser. No. F19
 Parallel to Serial Converter CCA (J314) Ser. No. F22
 Relay Driver And Current Monitor CCA (J319) Ser. No. F01

Test Set-up Verified: Yes No STE Self Test: Pass Fail

| Step No. | Test Description | Pass/Fail |
|----------|---------------------------------|-----------|
| 23 | Module power connects | P |
| 26 | Survival heater power turns on | P |
| 27 | Survival heater power turns off | P |
| 28 | Module power disconnects | P |
| 30 | Scanner 1 power turns on | P |
| 31 | Scanner 2 power turns on | P |
| 32 | Scanner 1 power turns off | P |
| 32 | Scanner 2 power turns off | P |
| 34 | PLLO toggle | P |
| 35 | Module power disconnect | P |

Assembly No. 1331670-2 Shop Order No. 543651
 Serial No. F03 Pass Fail
 Test Engineer D. Lund 10/20/98 Quality Control [Signature] OCT 21 '98
 (Signature) (Date) (Signature) (Date)
 Customer Representative (Flight hardware only) [Signature] 10-21-98
 (Signature) (Date)

TEST DATA SHEET 5
A1 Independence Of Measurements (Paragraph 4.2.6.1)

Analog Mux and A/D Converter CCA Serial No. F04

Test Set-up verified: YES NO

| Supply | Measured Value (V) | Limits (V) |
|--------|--------------------|------------|
| +5 | <u>4.806V</u> | +5 ± 0.25 |
| +15 | <u>15.89V</u> | +15 ± 1.0 |
| -15 | <u>-15.42V</u> | -15 ± 1.0 |

| Integrate and Dump/Filter CCA Serial No. | Channel No. | Average for SIGNAL switch in HI position | Average for SIGNAL switch in LO position | Measurement Dependence ≤0.01% | Pass/Fail |
|--|-------------|--|--|-------------------------------|-----------|
| F16 | 0 | 14171.3 | 14169.6 | 0.00259 | P |
| | 1 | 14168.9 | 14165.9 | 0.00458 | P |
| | 2 | 14176.6 | 14174.8 | 0.00275 | P |
| | 3 | 14174 | 14171.9 | 0.0032 | P |
| F19 | 0 | 14155.9 | 14154.8 | 0.00168 | P |
| | 1 | 14143 | 14141.8 | 0.00183 | P |
| | 2 | 14154.9 | 14152.9 | 0.00305 | P |
| | 3 | 14162.7 | 14160.7 | 0.00305 | P |
| F27 | 0 | 14105.6 | 14103.7 | 0.0029 | P |
| | 1 | 14106.9 | 14105 | 0.0029 | P |
| | 2 | 14095.9 | 14092.8 | 0.00473 | P |
| | 3 | 14120.9 | 14119 | 0.0029 | P |
| F37 | 0 | 14181.7 | 14179 | 0.00412 | P |
| | 1 | 14175.7 | 14173.7 | 0.00305 | P |
| | 2 | 14170 | 14167.6 | 0.00366 | P |
| | 3 | 14178.8 | 14176.8 | 0.00305 | P |

Assembly No. 1331670-2

Shop Order No. 543651

Serial No. F03

Pass Fail

Test Engineer [Signature] 10/20/98
(Signature) (Date)

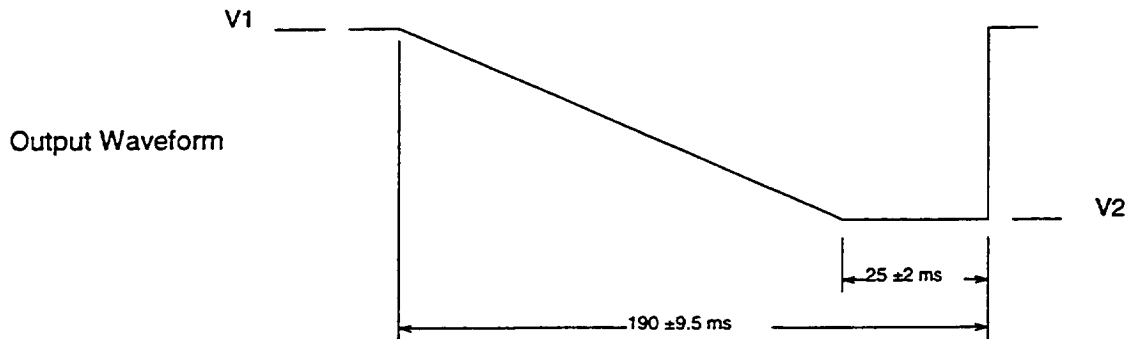
Quality Control [Signature] Oct 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only)

[Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 6 (Sheet 1 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

Analog Mux and A/D Converter CCA: Ser. No. F04
 Integrate and Dump/Filter CCA: Ser. No. F16
 Rack Slot J308: Ser. No. F19
 Rack Slot J309: Ser. No. F27
 Rack Slot J310: Ser. No. F37
 Rack Slot J311: Ser. No. F37



| Channel | Data | Data Limits | Data Pass/Fail | Integrator Waveform Pass/Fail |
|---------|-------|----------------|----------------|-------------------------------|
| 3 | 29265 | 27282 to 31076 | P | P |
| 4 | 29241 | 27282 to 31076 | P | P |
| 5 | 29114 | 27282 to 31076 | P | P |
| 6 | 29213 | 27282 to 31076 | P | P |
| 7 | 29218 | 27282 to 31076 | P | P |
| 8 | 29184 | 27282 to 31076 | P | P |
| 9 | 29007 | 27282 to 31076 | P | P |
| 10 | 29267 | 27282 to 31076 | P | P |
| 11 | 29233 | 27282 to 31076 | P | P |
| 12 | 29240 | 27282 to 31076 | P | P |
| 13 | 29109 | 27282 to 31076 | P | P |
| 14 | 29280 | 27282 to 31076 | P | P |
| 15 | 29256 | 27282 to 31076 | P | P |

TEST DATA SHEET 6 (Sheet 2 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

| Signal Name | Output | Output Return | Signal Levels | - Pass/Fail |
|------------------------|---------|---------------|---------------|-------------|
| I/H | J301-42 | J301-41 | Pulses (TTL) | P |
| Dump | J301-45 | J301-41 | Pulses (TTL) | P |
| +5 Vdc GSE Interlock A | J301-61 | J301-70 | +5 V | P |
| +5 Vdc GSE Interlock B | J301-62 | J301-70 | +5 V | P |

Assembly No. 1331670-2

Shop Order No. 543657

Serial No. F03

Pass Fail

Test Engineer [Signature] 10/20/98
(Signature) (Date)

Quality Control [Signature] OCT 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 7 (Sheet 1 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Temperature Sensor A CCA(J303) Serial No. F19
 Temperature Sensor B CCA (J304) Serial No. F27
 Temperature Sensor B CCA (J305) Serial No. F32
 Temperature Sensor Analog Mux CCA (J306) Serial No. F16

| Dig. A Temp No. | Description | Data | Data Limits | Pass/Fail |
|-----------------|------------------|-------|----------------|-----------|
| 1 | Scan Motor A1-1 | 31310 | 28259 to 32513 | P |
| 2 | Scan Motor A1-2 | 31415 | 28259 to 32513 | P |
| 3 | Feedhorn A1-1 | 30499 | 28259 to 32513 | P |
| 4 | Feedhorn A1-2 | 31296 | 28259 to 32513 | P |
| 5 | RF MUX A1-1 | 31275 | 28259 to 32513 | P |
| 6 | RF MUX A1-2 | 31375 | 28259 to 32513 | P |
| 7 | LO CH 3 | 31520 | 28259 to 32513 | P |
| 8 | LO CH 4 | 31367 | 28259 to 32513 | P |
| 9 | LO CH 5 | 31615 | 28259 to 32513 | P |
| 10 | LO CH 6 | 31345 | 28259 to 32513 | P |
| 11 | LO CH 7 | 31398 | 28259 to 32513 | P |
| 12 | LO CH 8 | 31158 | 28259 to 32513 | P |
| 13 | LO CH 15 | 31375 | 28259 to 32513 | P |
| 14 | PLO #2 | 31344 | 28259 to 32513 | P |
| 15 | PLO #1 | 31416 | 28259 to 32513 | P |
| 16 | N/A | N/A | N/A | N/A |
| 17 | Mixer IF CH 3 | 31446 | 28259 to 32513 | P |
| 18 | Mixer IF CH 4 | 31082 | 28259 to 32513 | P |
| 19 | Mixer IF CH 5 | 31317 | 28259 to 32513 | P |
| 20 | Mixer IF CH 6 | 31208 | 28259 to 32513 | P |
| 21 | Mixer IF CH 7 | 31359 | 28259 to 32513 | P |
| 22 | Mixer IF CH 8 | 31282 | 28259 to 32513 | P |
| 23 | Mixer IF CH 9/14 | 31650 | 28259 to 32513 | P |
| 24 | Mixer IF CH 15 | 31241 | 28259 to 32513 | P |
| 25 | IF Amp CH 11/14 | 31311 | 28259 to 32513 | P |
| 26 | IF Amp CH 9 | 31398 | 28259 to 32513 | P |
| 27 | IF Amp CH 10 | 31435 | 28259 to 32513 | P |
| 28 | IF Amp CH 11 | 31551 | 28259 to 32513 | P |
| 29 | DC/DC Conv | 31185 | 28259 to 32513 | P |
| 30 | IF Amp CH 13 | 31386 | 28259 to 32513 | P |
| 31 | IF Amp CH 14 | 31383 | 28259 to 32513 | P |
| 32 | IF Amp CH 12 | 31583 | 28259 to 32513 | P |
| 33 | RF Shelf A1-1 | 31190 | 28259 to 32513 | P |
| 34 | RF Shelf A1-2 | 28387 | 28259 to 32513 | P |
| 35 | Detector/Preamp | 31295 | 28259 to 32513 | P |

TEST DATA SHEET 7 (Sheet 2 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

| Dig. A Temp No. | Description | Data | Data Limits | Pass/Fail |
|-----------------|-------------------|-------|----------------|-----------|
| 36 | A1-1 Warm Load 1 | 22552 | 20339 to 23401 | P |
| 37 | A1-1 Warm Load 2 | 22719 | 20339 to 23401 | P |
| 38 | A1-1 Warm Load 3 | 22751 | 20339 to 23401 | P |
| 39 | A1-1 Warm Load 4 | 22831 | 20339 to 23401 | P |
| 40 | A1-1 Warm Load C | 22711 | 20339 to 23401 | P |
| 41 | A1-2 Warm Load 1 | 22587 | 20339 to 23401 | P |
| 42 | A1-2 Warm Load 2 | 22687 | 20339 to 23401 | P |
| 43 | A1-2 Warm Load 3 | 22886 | 20339 to 23401 | P |
| 44 | A1-2 Warm Load 4 | 22440 | 20339 to 23401 | P |
| 45 | A1-2 Warm Load C | 22739 | 20339 to 23401 | P |
| 46 | Thermal Reference | 25402 | 23340 to 26320 | P |

Assembly No. 1331670-2

Shop Order No. 543651

Serial No. F03

Pass Fail

Test Engineer *D. Lind* 10/20/98
(Signature) (Date)

Quality Control *[Signature]* OCT 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only) *[Signature]* 10-21-98
(Signature) (Date)

TEST DATA SHEET 8
A1 Analog Telemetry (Paragraph 4.2.6.4)

| ANALOG HSKP Switch Position | DVM Reading (V) | Limits (V) | Pass/Fail |
|--------------------------------|--------------------|-------------------------------------|-----------|
| 1 | 2.98 | 2.85 to 3.15 | P |
| 2 | 3.455 | 3.30 to 3.66 | P |
| 3 | 2.968 | 2.87 to 3.17 | P |
| 4 | 3.001 | 2.85 to 3.15 | P |
| 5 | 3.452 | 3.30 to 3.66 | P |
| 6 | 2.982 | 2.87 to 3.17 | P |
| 7 | 3.449 | 3.30 to 3.66 | P |
| 8 | 2.976 | 2.87 to 3.17 | P |
| 9 | 2.979 | 2.85 to 3.15 | P |
| 10 | 3.569 | 3.42 to 3.78 | P |
| 11 | 3.263 | 3.13 to 3.45 | P |
| 12 | 2.963 | 2.84 to 3.14 | P |
| 13 | 2.955 | 2.84 to 3.14 | P |
| 14 | 2.961 | 2.84 to 3.14 | P |
| 15 | 2.967 | 2.84 to 3.14 | P |
| 16 | 2.970 | 2.84 to 3.14 | P |
| 17 | 2.966 | 2.84 to 3.14 | P |
| 18 | 3.447 | 3.30 to 3.66 | P |
| 19 | 0.05 | 4.30 to 4.66 ^{-0.1 to 0.1} | P |
| 19 | -4.035 | 0.4 to 0.48 ^{-3.7 to -4.3} | P |
| 20 | 0.059 | 4.30 to 4.66 ^{-0.1 to 0.1} | P |
| 20 | -4.025 | 0.4 to 0.48 ^{-3.7 to -4.3} | P |
| 21 | 0.006 | -0.05 to 0.05 | P |
| 21 | 2.963 | 2.8 to 3.4 | P |
| 22 | 0.017 | -0.05 to 0.05 | P |
| 22 | 2.970 | 2.8 to 3.4 | P |

19
9/28/98
Q3
228

Assembly No. 1331670-2

Shop Order No. 543651

Serial No. F03

Pass Fail

Test Engineer [Signature] 10/20/98
(Signature) (Date)

Quality Control [Signature] OCT 21 '98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
(Signature) (Date)

TEST DATA SHEET 9
A1 Scan Drive/ Signal Processor Tests (Paragraph 4.3.1 And 4.3.2)

A1-1 Drive Subsystem CCAs:

Interface Converter CCA (J320) Ser. No. F27
 Resolver Data Isolator CCA (J321) Ser. No. F21
 R/D Converter/Oscillator CCA (J322) Ser. No. F22
 Motor Drive 3-Hall Sensor CCA (J401) Ser. No. F04
 Test Set-up Verified: Yes No

19 Feb 9/28/98
QC 229

| Para/Step No. | Mode | Pass/Fail |
|---------------|------------------------------|-----------|
| 4.3.1.2.1/11 | Motor in warm cal position | P |
| 4.3.1.2.2/3 | Motor in nadir position | P |
| 4.3.1.2.3/2 | Motor in cold cal position 1 | P |
| 4.3.1.2.3/3 | Motor in cold cal position 2 | P |
| 4.3.1.2.3/4 | Motor in cold cal position 3 | P |
| 4.3.1.2.3/5 | Motor in cold cal position 4 | P |
| 4.3.1.2.4/5 | Motor in full scan mode | P |
| 4.3.1.2.5/9 | GSE mode 2 | P |
| 4.3.1.2.6/4 | GSE mode 4 | P |
| 4.3.1.2.7/4 | GSE mode 5 | P |
| 4.3.1.2.8/4 | GSE mode 1 | P |
| 4.3.1.2.9/4 | GSE mode 3 | P |
| 4.3.1.2.9/7 | GSE mode 7 | P |
| 4.3.1.2.10/2 | Scan power off | P |

A1-2 Drive Subsystem CCAs:

Interface Converter CCA (J323) Ser. No. F34
 Resolver Data Isolator CCA (J324) Ser. No. F31
 R/D Converter/Oscillator CCA (J325) Ser. No. F25
 Motor Drive 3-Hall Sensor CCA (J404) Ser. No. F11
 Test Set-up Verified: Yes No

19 Feb 9/28/98
QC 229

Para. No./Step No.

4.3.2.2 A1-2 scan drive operates in full scan mode. Pass Fail

Assembly No. 1331670-2 Shop Order No. 543651

Serial No. P03 Pass Fail

Test Engineer [Signature] 10/28/98 Quality Control [Signature] Oct 21 '98
 (Signature) (Date) (Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 10-21-98
 (Signature) (Date)

TEST DATA SHEET 10
A1 Supply Currents (Paragraph 4.4)

| Voltages | Measured Current | Limits (in mA) | Pass/Fail |
|----------|------------------|-----------------------------------|-----------|
| +28.7V | 7.55 | 6 to 12 | P |
| +5.7V | 660 | 700 to 1642 550 to 900 | P |
| +15.7V | 197 | 152 to 364 | P |
| -15.7V | 192 | 162 to 381 | P |


D.L.
9/28/98
CC
229

Assembly No. 1331670-2 Shop Order No. 543651

Serial No. F03 Pass Fail

Test Engineer *D.L.* 10/20/98 Quality Control *[Signature]* OCT 21 '98
(Signature) (Date) (Signature) (Date)

Customer Representative (Flight hardware only) *[Signature]* 10-21-98
(Signature) (Date)

| | | | |
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| | | 6. Performing Organization Code --- | |
| 7. Author(s) D. Lund | | 8. Performing Organization Report No. 11302 | |
| | | 10. Work Unit No. --- | |
| 9. Performing Organization Name and Address Aerojet 1100 W. Hollyvale Azusa, CA 91702 | | 11. Contract or Grant No. NAS 5-32314 | |
| | | 13. Type of Report and Period Covered Final | |
| 12. Sponsoring Agency Name and Address NASA Goddard Space Flight Center Greenbelt, Maryland 20771 | | 14. Sponsoring Agency Code --- | |
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| 16. ABSTRACT (Maximum 200 words) This is the Engineering Test Report, METSAT A1 Signal Processor (P/N 1331670-2, S/N F03), for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A). | | | |
| 17. Key Words (Suggested by Author(s)) EOS Microwave System | | 18. Distribution Statement Unclassified — Unlimited | |
| 19. Security Classif. (of this report) Unclassified | 20. Security Classif. (of this page) Unclassified | 21. No. of pages | 22. Price --- |

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| 6. AUTHOR(S) D. Lund | | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Aerojet 1100 W. Hollyvale Azusa, CA 91702 | | | 8. PERFORMING ORGANIZATION REPORT NUMBER 11302 28 October 1998 | |
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| INPUT FROM: D. Lund | DATE | CDRL: 207 | SPECIFICATION ENGINEER: N/A |
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