Report 11648
March 2000

AEROJET

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)
Performance Verificatgion Report
Final Comprehensive Performance Test Report,
P/N 1331720-TST, S/N 108/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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TEST DATA SHEET 1 (Sheet 1 of 9)
Grounding System Test (Paragraph 3.2.4.1)

J1 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	+28 V MLB	> 100k	OL	P
J1-2	+28 V MLB	> 100k	OL	P
J1-3	+28 V MLB RTN	> 100k	OL	P
J1-4	+28 V MLB RTN	> 100k	OL	P
J1-5	+28 V PLB	> 100k	OL	P
J1-6	+28 V PLB	> 100k	OL	P
J1-7	+28 V PLB RTN	> 100k	OL	P
J1-8	+28 V PLB RTN	> 100k	OL	P
J1-9	+28 V TMB	> 100k	OL	P
J1-10	28 V TMB RTN	> 100k	OL	P
J1-11	NO CONNECTION	> 100k	OL	P
J1-12	NO CONNECTION	> 100k	OL	P
J1-13	CHASSIS GROUND (E1)	< 1	.20Ω	P
J1-14	+28 V MLB	> 100k	OL	P
J1-15	+28 V MLB	> 100k	OL	P
J1-16	+28 V MLB RTN	> 100k	OL	P
J1-17	+28 V MLB RTN	> 100k	OL	P
J1-18	+28 V PLB	> 100k	OL	P
J1-19	+28 V PLB	> 100k	OL	P
J1-20	+28 V PLB RTN	> 100k	OL	P
J1-21	+28 V PLB RTN	> 100k	OL	P
J1-22	+28 V TMB	> 100k	OL	P
J1-23	28 V TMB RTN	> 100k	OL	P
J1-24	SAFETY HTR PWR	> 100k	OL	P
J1-25	SAFETY HTR RTN	> 100k	OL	P

OL = > 30MΩ

TEST DATA SHEET 1 (Sheet 2 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

J2 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-1	Chassis Ground (E2)	< 1	0.50 Ω	P
J2-2	DATA CLOCK (C1)	> 100k	OL	P
J2-3	Signal Return	> 100k	OL	P
J2-4	No Connection	> 100k	OL	P
J2-5	DIGITAL-A DATA OUT	> 100k	OL	P
J2-6	DATA ENABLE (A1)	> 100k	OL	P
J2-7	8 SEC SYNC PULSE	> 100k	OL	P
J2-8	No Connection	> 100k	OL	P
J2-9	No Connection	> 100k	OL	P

J3 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J3-1	1.248 MHz CLK	> 100k	OL	P
J3-2	1.248 MHz CLK RTN	> 100k	OL	P
J3-3	Chassis GND (E3)	< 1	0.50 Ω	P

J5 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J5-1	Chassis Ground (E5)	< 1	0.16 Ω	P
J5-2	MODULE PWR IND	> 100k	O.L.	P
J5-3	COLD CAL POS MSB (OUT)	> 100k	O.L.	P
J5-4	No Connection	> 100k	O.L.	P
J5-5	SCANNER A1-2 ON/OFF	> 100k	O.L.	P
J5-6	ANT IN COLD CAL POS	> 100k	O.L.	P
J5-7	PLL PRI/RED	> 100k	OL.	P
J5-8	No Connection	> 100k	OL.	P
J5-9	SURV HTR ON/OFF	> 100k	O.L.	P
J5-10	No Connection	> 100k	O.L.	P
J5-11	COLD CAL POS LSB (OUT)	> 100k	O.L.	P
J5-12	SCANNER A1-1 ON/OFF	> 100k	OL.	P
J5-13	ANT IN WARM CAL POS	> 100k	OL.	P
J5-14	ANT IN NADIR POS	> 100k	OL.	P
J5-15	FULL SCAN MODE	> 100k	OL.	P

OL => 30MΩ

TEST DATA SHEET 1 (Sheet 3 of 9)
Grounding System Test (Paragraph 3.2.4.1)

J4 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J4-1	Chassis Ground (E4)	< 1	0.13 Ω	P
J4-2	MODULE PWR DISCONN	> 100k	O.L.	P
J4-3	SURVIVAL HTR ON	> 100k	O.L.	P
J4-4	MODULE TOTALLY OFF	> 100k	O.L.	P
J4-5	SCANNER A1-2 ON/OFF	> 100k	O.L.	P
J4-6	ANT AT COLD CAL POS	> 100k	O.L.	P
J4-7	PLL SELECT	> 100k	O.L.	P
J4-8	ANT AT NADIR POS	> 100k	O.L.	P
J4-9	COLD CAL POS MSB (IN)	> 100k	O.L.	P
J4-10	No Connection	> 100k	O.L.	P
J4-11	No Connection	> 100k	O.L.	P
J4-12	+10 V INTERFACE BUS	> 100k	O.L.	P
J4-13	10 V INTERFACE BUS RTN	> 100k	O.L.	P
J4-14	MODULE PWR CONN	> 100k	O.L.	P
J4-15	SURVIVAL HTR OFF	> 100k	O.L.	P
J4-16	SCANNER A1-1 ON/OFF	> 100k	O.L.	P
J4-17	ANT AT WARM CAL POS	> 100k	O.L	P
J4-18	FULL SCAN	> 100k	O.L.	P
J4-19	COLD CAL POS LSB (IN)	> 100k	O.L.	P
J4-20	No Connection	> 100k	O.L.	P
J4-21	No Connection	> 100k	O.L.	P
J4-22	No Connection	> 100k	O.L.	P
J4-23	No Connection	> 100k	O.L.	P
J4-24	+10 V INTERFACE BUS	> 100k	O.L.	P
J4-25	10 V INTERFACE BUS RTN	> 100k	O.L.	P

O.L => 40MΩ

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

J6 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-1	Chassis GND (E6)	< 1	0.14 Ω	P
J6-2	RF SHELF A1-1 TEMP	> 100k	O.L.	P
J6-3	A1-1 SCAN. MTR. TEMP	> 100k	O.L.	P
J6-4	WARM LOAD A1-1 TEMP	> 100k	O.L.	P
J6-5	No Connection	> 100k	O.L.	P
J6-6	PLLO RED LOCK DETECT	> 100k	O.L.	P
J6-7	No Connection	> 100k	O.L.	P
J6-8	A1-1 DRIVE MTR CURR	> 100k	O.L.	P
J6-9	+15 V ANT DR MON	> 100k	O.L.	P
J6-10	+5 V ANT DR MON	> 100k	O.L.	P
J6-11	+15 V SIG PROC MON	> 100k	O.L.	P
J6-12	+5 V SIG PROC MON	> 100k	O.L.	P
J6-13	L.O. VOLTAGE CH 3 MON	> 100k	O.L.	P
J6-14	L.O. VOLTAGE CH 5 MON	> 100k	O.L.	P
J6-15	L.O. VOLTAGE CH 7 MON	> 100k	O.L.	P
J6-16	+15 VDC PLL LO MON	> 100k	O.L.	P
J6-17	+10 V MIXER/AMP MON	> 100k	O.L.	P
J6-18	L.O. VOLTAGE CH 15 MON	> 100k	O.L.	P
J6-19	No Connection	> 100k	O.L.	P
J6-20	28 V TMB RTN	> 100k	O.L.	P
J6-21	RF SHELF A1-2 TEMP	> 100k	O.L.	P
J6-22	A1-2 SCAN MTR TEMP	> 100k	O.L.	P
J6-23	WARM LOAD A1-2 TEMP	> 100k	O.L.	P
J6-24	No Connection	> 100k	O.L.	P
J6-25	PLLO PRI LOCK DETECT	> 100k	O.L.	P
J6-26	No Connection	> 100k	O.L.	P
J6-27	A1-2 DRIVE MTR CURR	> 100k	O.L.	P
J6-28	-15 V ANT DR MON	> 100k	O.L.	P
J6-29	-15 V SIG PROC MON	> 100k	O.L.	P
J6-30	L.O. VOLTAGE CH 4 MON	> 100k	O.L.	P
J6-31	L.O. VOLTAGE CH 6 MON	> 100k	O.L.	P
J6-32	L.O. VOLTAGE CH 8 MON	> 100k	O.L.	P
J6-33	-15 VDC PLL LO MON	> 100k	O.L.	P
J6-34	+8 V IF AMP MON	> 100k	O.L.	P
J6-35	No Connection	> 100k	O.L.	P
J6-36	No Connection	> 100k	O.L.	P
J6-37	No Connection	> 100k	O.L.	P

O.L. = > 40MΩ

TEST DATA SHEET 1 (Sheet 5 of 9)
Grounding System Test (Paragraph 3.2.4.1)

J7 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J7-1	Chassis GND (E7)	< 1	0.11 Ω	P
J7-2	No Connection	> 100k	0.L.	P
J7-3	REDUN PLO LOCK DET	> 100k	0.L.	P
J7-4	15 V RTN (2/3)	> 100k	0.L.	P
J7-5	15 V RTN (2/3)	> 100k	0.L.	P
J7-6	DUMP TEST POINT	> 100k	0.L.	P
J7-7	No Connection	> 100k	0.L.	P
J7-8	CH3 OUT TEST POINT	> 100k	0.L.	P
J7-9	CH4 OUT TEST POINT	> 100k	0.L.	P
J7-10	CH5 OUT TEST POINT	> 100k	0.L.	P
J7-11	CH6 OUT TEST POINT	> 100k	0.L.	P
J7-12	CH7 OUT TEST POINT	> 100k	0.L.	P
J7-13	CH8 OUT TEST POINT	> 100k	0.L.	P
J7-14	CH9 OUT TEST POINT	> 100k	0.L.	P
J7-15	No Connection	> 100k	0.L.	P
J7-16	No Connection	> 100k	0.L.	P
J7-17	GSE CMD LSB	> 100k	0.L.	P
J7-18	GSE CMD MSB-1	> 100k	0.L.	P
J7-19	+5 V GSE INTERLOCK A	> 100k	0.L.	P
J7-20	No Connection	> 100k	0.L.	P
J7-21	No Connection	> 100k	0.L.	P
J7-22	PRI PLO LOCK DET	> 100k	0.L.	P
J7-23	No Connection	> 100k	0.L.	P
J7-24	I/H TEST POINT	> 100k	0.L.	P
J7-25	No Connection	> 100k	0.L.	P
J7-26	15 V RTN (2/3)	> 100k	0.L.	P
J7-27	CH10 OUT TEST POINT	> 100k	0.L.	P
J7-28	CH11 OUT TEST POINT	> 100k	0.L.	P
J7-29	CH12 OUT TEST POINT	> 100k	0.L.	P
J7-30	CH13 OUT TEST POINT	> 100k	0.L.	P
J7-31	CH14 OUT TEST POINT	> 100k	0.L.	P
J7-32	CH15 OUT TEST POINT	> 100k	0.L.	P
J7-33	No Connection	> 100k	0.L.	P
J7-34	No Connection	> 100k	0.L.	P
J7-35	GSE CMD MSB	> 100k	0.L.	P
J7-36	5 V RTN (1)	> 100k	0.L.	P
J7-37	+5 V GSE INTERLOCK B	> 100k	0.L.	P

0.L. = > 40 MΩ

TEST DATA SHEET 1 (Sheet 6 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	J1-2	+28 V MLB	< 1	.22Ω	P
J1-1	J1-14	+28 V MLB	< 1	.25Ω	P
J1-1	J1-15	+28 V MLB	< 1	.24Ω	P
J1-3	J1-4	28 V MLB RTN	< 1	.38Ω	P
J1-3	J1-16	28 V MLB RTN	< 1	.31Ω	P
J1-3	J1-17	28 V MLB RTN	< 1	.18Ω	P
J1-5	J1-6	+28 V PLB	< 1	.47Ω	P
J1-5	J1-18	+28 V PLB	< 1	.29Ω	P
J1-5	J1-19	+28 V PLB	< 1	.26Ω	P
J1-7	J1-8	28 V PLB RTN	< 1	.31Ω	P
J1-7	J1-20	28 V PLB RTN	< 1	.30Ω	P
J1-7	J1-21	28 V PLB RTN	< 1	.32Ω	P
J1-9	J1-22	+28 V TMB	< 1	.30Ω	P
J1-10	J1-23	28 V TMB RTN	< 1	.26Ω	P
J1-10	J6-20	28 V TMB RTN	< 1	.39Ω	P
J4-12	J4-24	+10 V INTERFACE BUS	< 1	.28Ω	P
J4-13	J4-25	10 V INTERFACE BUS RTN	< 1	.18Ω	P
J1-1	J1-3	+28 V MLB	> 100k	OL	P
J1-1	J1-5	+28 V MLB	> 100k	OL	P
J1-1	J1-7	+28 V MLB	> 100k	OL	P
J1-1	J1-9	+28 V MLB	> 100k	OL	P
J1-1	J1-10	+28 V MLB	> 100k	OL	P
J1-1	J1-24	+28 V MLB	> 100k	OL	P
J1-1	J1-25	+28 V MLB	> 100k	OL	P
J1-1	J2-3	+28 V MLB	> 100k	1.02 MΩ	P
J1-1	J4-12	+28 V MLB	> 100k	9 MΩ	P
J1-1	J4-13	+28 V MLB	> 100k	2.2 MΩ	P
J1-3	J1-5	28 V MLB RTN	> 100k	1.9 MΩ	P
J1-3	J1-7	28 V MLB RTN	> 100k	393 KΩ	P
J1-3	J1-9	28 V MLB RTN	> 100k	OL	P
J1-3	J1-10	28 V MLB RTN	> 100k	OL	P
J1-3	J1-24	28 V MLB RTN	> 100k	OL	P
J1-3	J1-25	28 V MLB RTN	> 100k	OL	P
J1-3	J2-3	28 V MLB RTN	> 100k	197 KΩ	P
J1-3	J4-12	28 V MLB RTN	> 100k	7.5 MΩ	P
J1-3	J4-13	28 V MLB RTN	> 100k	1.3 MΩ	P

OL => 40 MΩ

TEST DATA SHEET 1 (Sheet 7 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-5	J1-7	+28 V PLB	> 100k	OL	P
J1-5	J1-9	+28 V PLB	> 100k	OL	P
J1-5	J1-10	+28 V PLB	> 100k	OL	P
J1-5	J1-24	+28 V PLB	> 100k	OL	P
J1-5	J1-25	+28 V PLB	> 100k	OL	P
J1-5	J2-3	+28 V PLB	> 100k	OL	P
J1-5	J4-12	+28 V PLB	> 100k	OL	P
J1-5	J4-13	+28 V PLB	> 100k	OL	P
J1-7	J1-9	28 V PLB RTN	> 100k	OL	P
J1-7	J1-10	28 V PLB RTN	> 100k	OL	P
J1-7	J1-24	28 V PLB RTN	> 100k	OL	P
J1-7	J1-25	28 V PLB RTN	> 100k	OL	P
J1-7	J2-3	28 V PLB RTN	> 100k	OL	P
J1-7	J4-12	28 V PLB RTN	> 100k	2 MΩ	P
J1-7	J4-13	28 V PLB RTN	> 100k	2.8 MΩ	P
J1-9	J1-10	+28 V TMB	> 100k	7.8 MΩ	P
J1-9	J1-24	+28 V TMB	> 100k	OL	P
J1-9	J1-25	+28 V TMB	> 100k	OL	P
J1-9	J2-3	+28 V TMB	> 100k	OL	P
J1-9	J4-12	+28 V TMB	> 100k	OL	P
J1-9	J4-13	+28 V TMB	> 100k	OL	P
J1-10	J1-24	28 V TMB RTN	> 100k	OL	P
J1-10	J1-25	28 V TMB RTN	> 100k	OL	P
J1-10	J2-3	28 V TMB RTN	> 100k	OL	P
J1-10	J4-12	28 V TMB RTN	> 100k	OL	P
J1-10	J4-13	28 V TMB RTN	> 100k	OL	P
J1-24	J1-25	SAFETY HTR PWR	> 100k	OL	P
J1-24	J2-3	SAFETY HTR PWR	> 100k	OL	P
J1-24	J4-12	SAFETY HTR PWR	> 100k	OL	P
J1-24	J4-13	SAFETY HTR PWR	> 100k	OL	P
J1-25	J2-3	SAFETY HTR PWR RTN	> 100k	OL	P
J1-25	J4-12	SAFETY HTR PWR RTN	> 100k	OL	P
J1-25	J4-13	SAFETY HTR PWR RTN	> 100k	OL	P
J2-3	J4-12	SIGNAL RTN	> 100k	5 MΩ	P
J2-3	J4-13	SIGNAL RTN	> 100k	1.5 MΩ	P
J4-12	J4-13	+10 V INTERFACE BUS	> 100k	OL	P

OL => 40 MΩ

TEST DATA SHEET 1 (Sheet 8 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-2	J4-13	DATA CLOCK (C1)	> 2k	OL	P
J2-5	J4-13	DIGITAL-A DATA OUT	> 2k	OL	P
J2-6	J4-13	DATA ENABLE (A1)	> 2k	OL	P
J2-7	J4-13	8 SEC SYNC PULSE	> 2k	OL	P
J3-1	J4-13	1.248 MHZ CLK	> 2k	OL	P
J3-2	J4-13	1.248 MHZ CLK RTN	> 2k	OL	P
J4-2	J4-13	MODULE PWR DISCONN	> 2k	OL	P
J4-3	J4-13	SURVIVAL HTR ON	> 2k	OL	P
J4-4	J4-13	MODULE TOTALLY OFF	> 2k	OL	P
J4-5	J4-13	SCANNER A1-2 ON/OFF	> 2k	OL	P
J4-6	J4-13	ANT AT COLD CAL POS	> 2k	OL	P
J4-7	J4-13	PLL SELECT	> 2k	OL	P
J4-8	J4-13	ANT AT NADIR POS	> 2k	OL	P
J4-9	J4-13	COLD CAL POS MSB (IN)	> 2k	OL	P
J4-14	J4-13	MODULE PWR CONN	> 2k	OL	P
J4-15	J4-13	SURVIVAL HTR OFF	> 2k	OL	P
J4-16	J4-13	SCANNER A1-1 ON/OFF	> 2k	OL	P
J4-17	J4-13	ANT AT WARM CAL POS	> 2k	OL	P
J4-18	J4-13	FULL SCAN	> 2k	OL	P
J4-19	J4-13	COLD CAL POS LSB (IN)	> 2k	OL	P
J5-2	J4-13	MODULE PWR IND	> 2k	OL	P
J5-3	J4-13	COLD CAL POS MSB (OUT)	> 2k	OL	P
J5-5	J4-13	SCANNER A1-2 ON/OFF	> 2k	OL	P
J5-6	J4-13	ANT IN COLD CAL POS	> 2k	OL	P
J5-7	J4-13	PLL PRI/RED	> 2k	OL	P
J5-9	J4-13	SURV HTR ON/OFF	> 2k	OL	P
J5-11	J4-13	COLD CAL POS LSB (OUT)	> 2k	OL	P
J5-12	J4-13	SCANNER A1-1 ON/OFF	> 2k	OL	P
J5-13	J4-13	ANT IN WARM CAL POS	> 2k	OL	P
J5-14	J4-13	ANT IN NADIR POS	> 2k	OL	P
J5-15	J4-13	FULL SCAN MODE	> 2k	OL	P

OL => 40MΩ

TEST DATA SHEET 1 (Sheet 9 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-2	J1-10	RF SHELF A1-1 TEMP	> 2k	OL	P
J6-3	J1-10	A1-1 SCAN MTR.TEMP	> 2k	OL	P
J6-4	J1-10	WARM LOAD A1-1 TEMP	> 2k	OL	P
J6-6	J4-13	PLLO RED LOCK DETECT	> 2k	OL	P
J6-8	J4-13	A1-1 DRIVE MTR CVR	> 2k	OL	P
J6-9	J4-13	+15 VDC ANT DRIVE MON	> 2k	OL	P
J6-10	J4-13	+5 VDC ANT DRIVE MON	> 2k	OL	P
J6-11	J4-13	+15 VDC SIG PROC MON	> 2k	OL	P
J6-12	J4-13	+5VDC SIG PROC MON	> 2k	OL	P
J6-13	J4-13	L.O. VOLTAGE CH3 MON	> 2k	OL	P
J6-14	J4-13	L.O. VOLTAGE CH5 MON	> 2k	OL	P
J6-15	J4-13	L.O. VOLTAGE CH7 MON	> 2k	OL	P
J6-16	J4-13	+15 VDC PLL LO MON	> 2k	OL	P
J6-17	J4-13	+10 V MIXER/AMP MON	> 2k	OL	P
J6-18	J4-13	L.O. VOLTAGE CH15 MON	> 2k	OL	P
J6-21	J4-10	RF SHELF A1-2 TEMP	> 2k	OL	P
J6-22	J4-10	A1-2 SCAN MTR.TEMP	> 2k	OL	P
J6-23	J4-10	WARM LOAD A1-2 TEMP	> 2k	OL	P
J6-25	J4-13	PLLO PRI LOCK DETECT	> 2k	OL	P
J6-27	J4-13	A1-2 DRIVE MTR CURR	> 2k	OL	P
J6-28	J4-13	-15 VDC ANT DRIVE MON	> 2k	OL	P
J6-29	J4-13	-15 VDC SIG PROC MON	> 2k	OL	P
J6-30	J4-13	L.O. VOLTAGE CH4 MON	> 2k	OL	P
J6-31	J4-13	L.O. VOLTAGE CH6 MON	> 2k	OL	P
J6-32	J4-13	L.O. VOLTAGE CH8 MON	> 2k	OL	P
J6-33	J4-13	-15 VDC PLL LO MON	> 2k	OL	P
J6-34	J4-13	IF AMP MON	> 2k	OL	P

OL => 40MΩ

FINAL

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

AMSU 6 SEIT / 139 T 3/2/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

TEST DATA SHEET 2

+28 MLB During Turn-on Transient (Paragraph 3.2.4.2.1.1)

At 28.56 Vdc:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	246.4 ms	20 ms max	300 ms max	P
8	Peak Current	4.907 Amps	10.6 Amps	5.9 Amps	P
10	Rate of Change (Slope): dI/dT	93.91 mA/μs	677 mA/μs	250 mA/μs	P

At 27.44 Vdc:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	239.2 ms	20 ms max	300 ms max	P
8	Peak Current	4.59 Amps	10.6 Amps	5.9 Amps	P
10	Rate of Change (Slope): dI/dT	135.27 mA/μs	677 mA/μs	250 mA/μs	P

At 28.00 Vdc:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	246.1 ms	20 ms max	300 ms max	P
8	Peak Current	4.718 Amps	10.6 Amps	5.9 Amps	P
10	Rate of Change (Slope): dI/dT	78.48 mA/μs	677 mA/μs	250 mA/μs	P

* Refer to Figure 5.

FINAL

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

[signature] 3/3/00

Test Systems Engineer Date

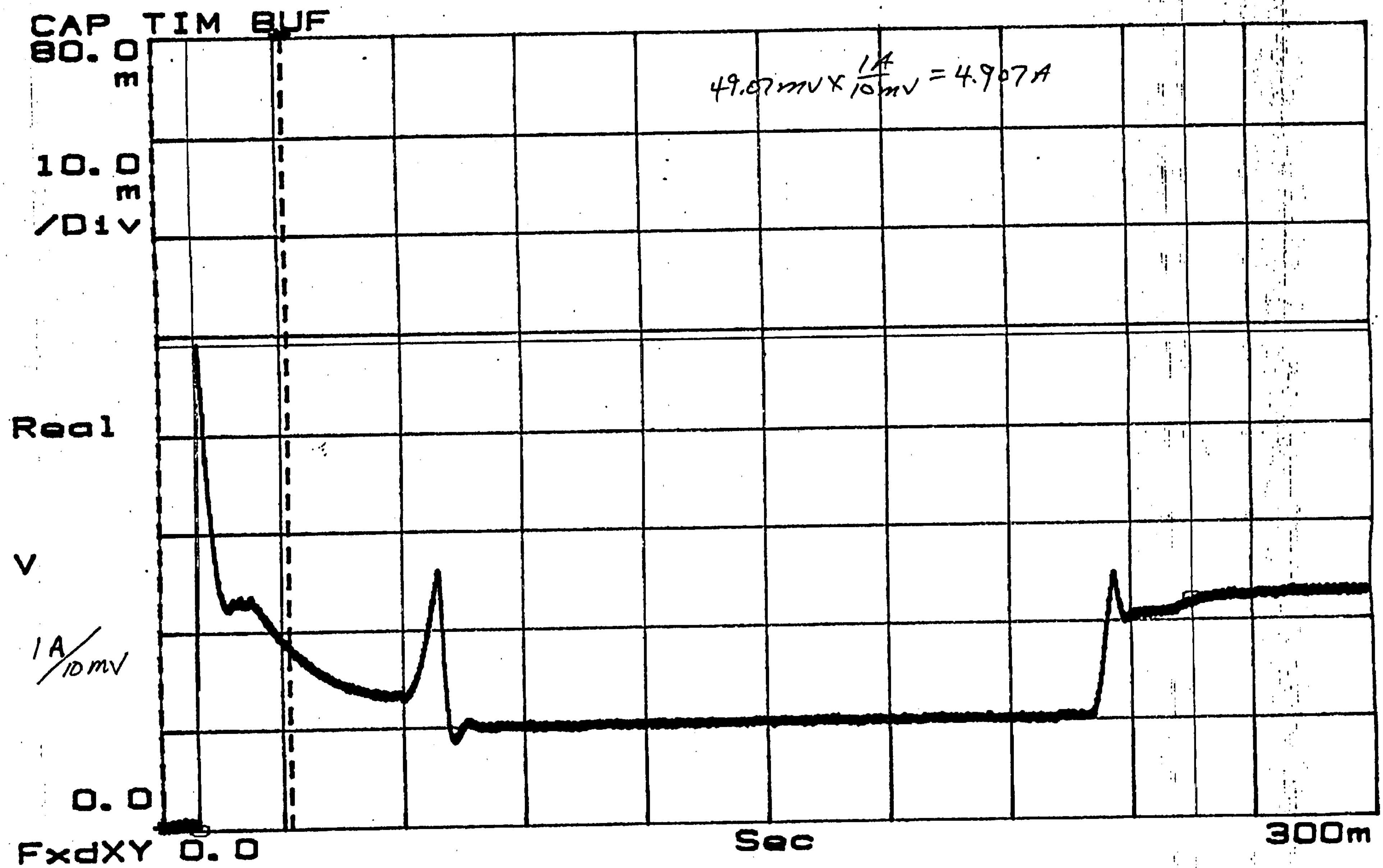
[signature] 3-3-00

Customer Representative Date
(Flight Hardware Only)

[signature] 7A 194 3/3/00

Quality Control Date

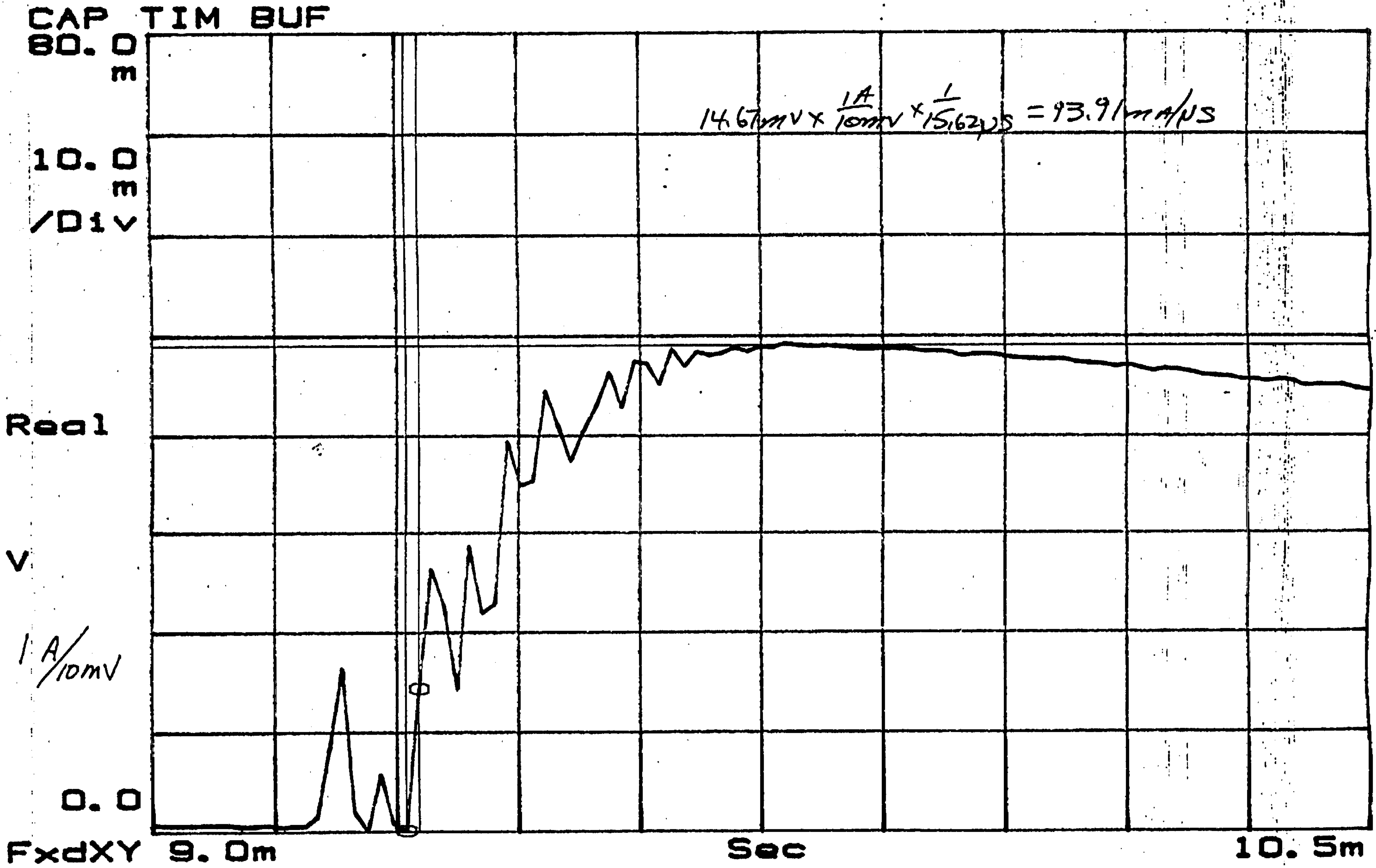
X=255. 7mS ΔX=246. 4mS Y=49. 0667m ΔY=49. 07mV
Ya=22. 1046m ΔYa=31. 08mV



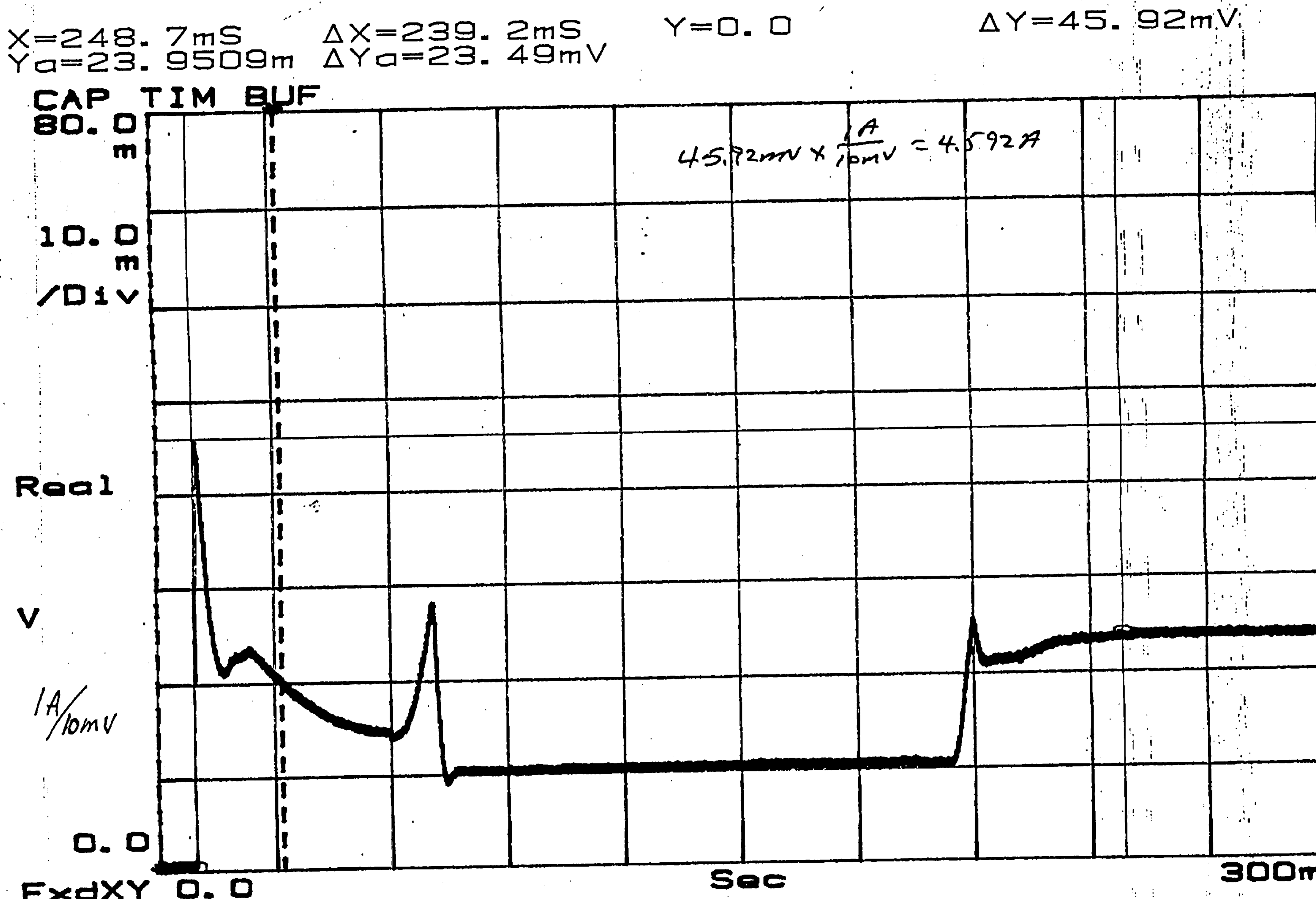
FINAL CPT

TEST ENG: R. Haigl DATE 3/3/00

X=9.312mS ΔX=15.62μS Y=49.0667m ΔY=49.07mV
Ya=-410.29μ ΔYa=14.67mV



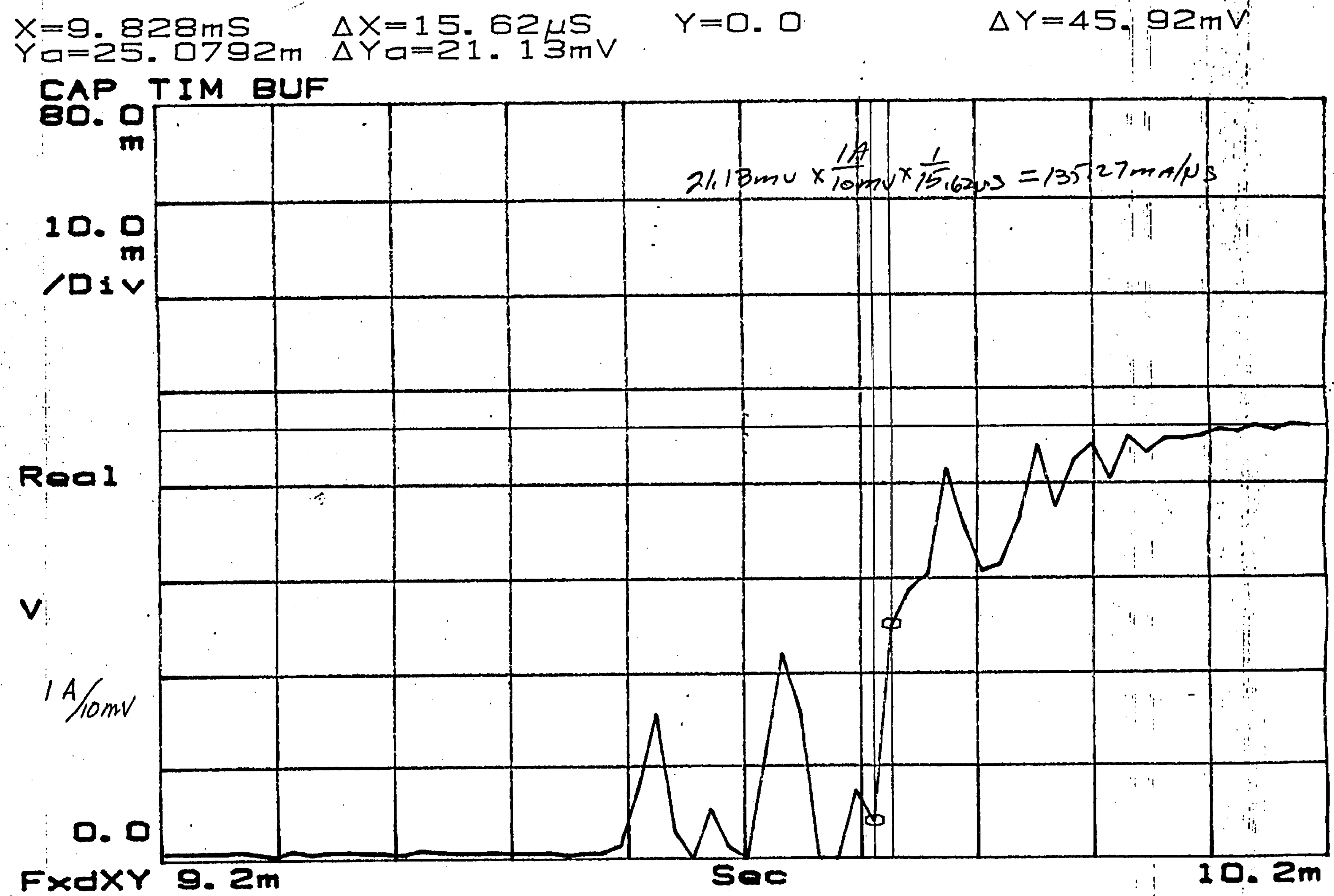
S/O : 37327 OP: 0830 FINAL CPT TEST ENG: R. Haig DATE 3/3/00



S/O : 373237 OP: 0830

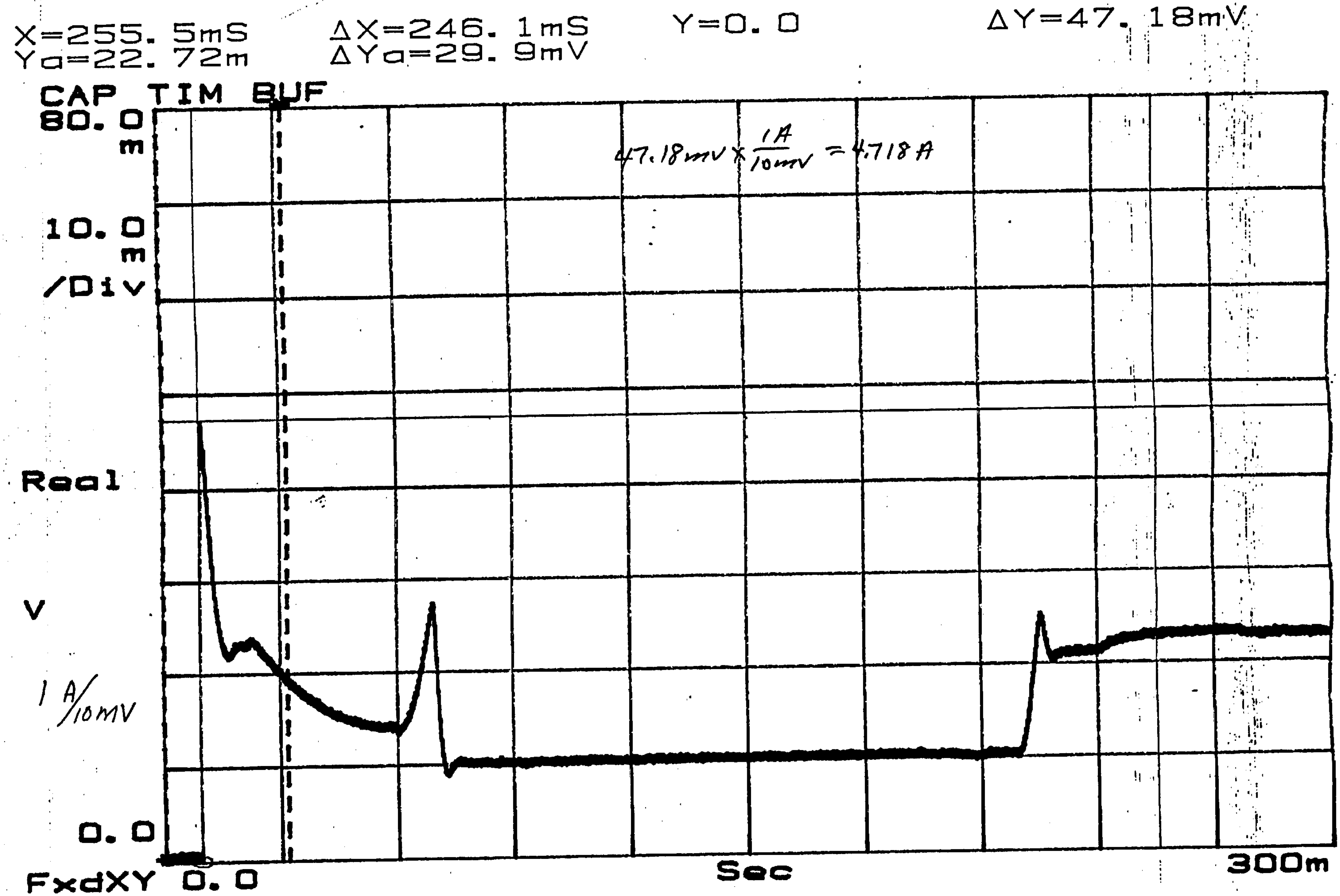
FINAL CPT

TEST ENG: R. Haig DATE 3/3/00



FINAL CPT

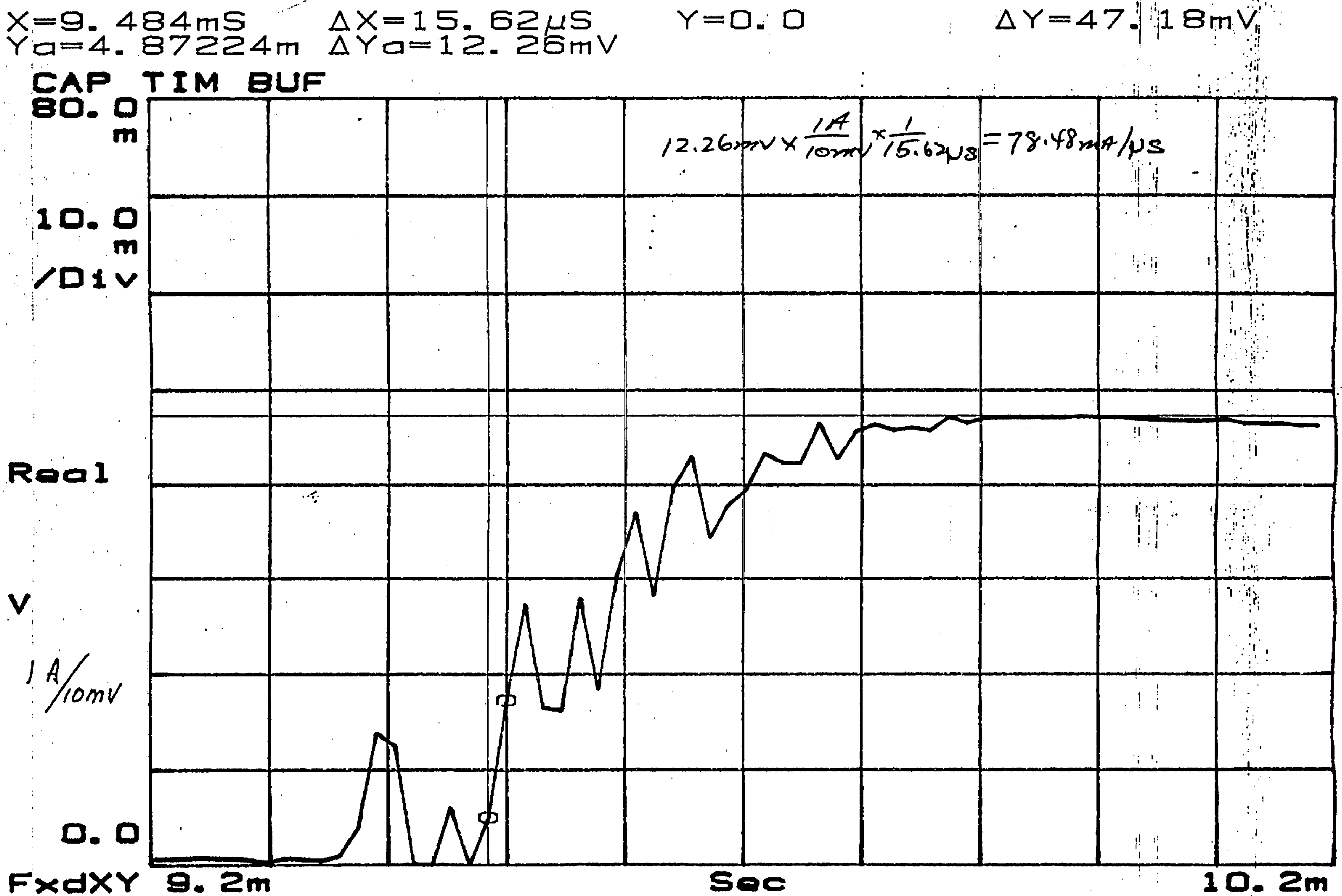
TEST ENG: R. Haid DATE 3/3/00



FINAL CPT

TEST ENG: R. Hail DATE 3/3/00

S/O: 373237 OP: 0830



S/O : 373237 OP: 0830

FINAL CPT

TEST ENG: R. Haid DATE 3/3/00

TEST DATA SHEET 3
+28 MLB Operating Power (Paragraph 3.2.4.2.1.2)

Step	+28V MLB at 27 Volts	Measured	Units	Required	Pass/Fail
2	+28 V MLB voltage at 27 V (V_b) (Measured)	27.00V	Volts	27.0 ± 0.1	P
3	Average Current (I_V) (PLLO#1)	2.31 A	Amps	N/A	N/A
4	+28 V MLB operating power = I_V x V_b (PLLO#1)	62.37W	Watts	82 W max	P
6	Average current (I_V) (PLLO#2)	2.32	Amps	N/A	N/A
7	+28 V MLB operating power = I_V x V_b (PLLO#2)	62.64W	Watts	82 W max	P
	+28 V MLB at 28 Volts				
9	+28 V MLB bus voltage at 28 V (V_b) (Measured)	28.00V	Volts	28.0 ± 0.1	P
10	Average Current (I_V) (PLLO#1)	2.23A	Amps	N/A	N/A
11	+28 V MLB operating power = I_V X V_b (PLLO#1)	62.44W	Watts	82 W max	P
13	Average current (I_V) (PLLO#2)	2.24 A	Amps	N/A	N/A
14	+28 V MLB operating power = I_V x V_b (PLLO#2)	62.72W	Watts	82 W max	P
	+28 V MLB at 29 Volts				
16	+28 V MLB voltage at 29 V (V_b) (Measured)	29.05V	Volts	29.0 ± 0.1	P
17	Average Current (I_V) (PLLO#1)	2.15 A	Amps	N/A	N/A
18	+28 V MLB operating power = I_V x V_b (PLLO#1)	62.45W	Watts	82 W max	P
20	Average current (I_V) (PLLO#2)	2.16 A	Amps	N/A	N/A
21	+28 V MLB operating power = I_V x V_b (PLLO#2)	62.74W	Watts	82 W max	P

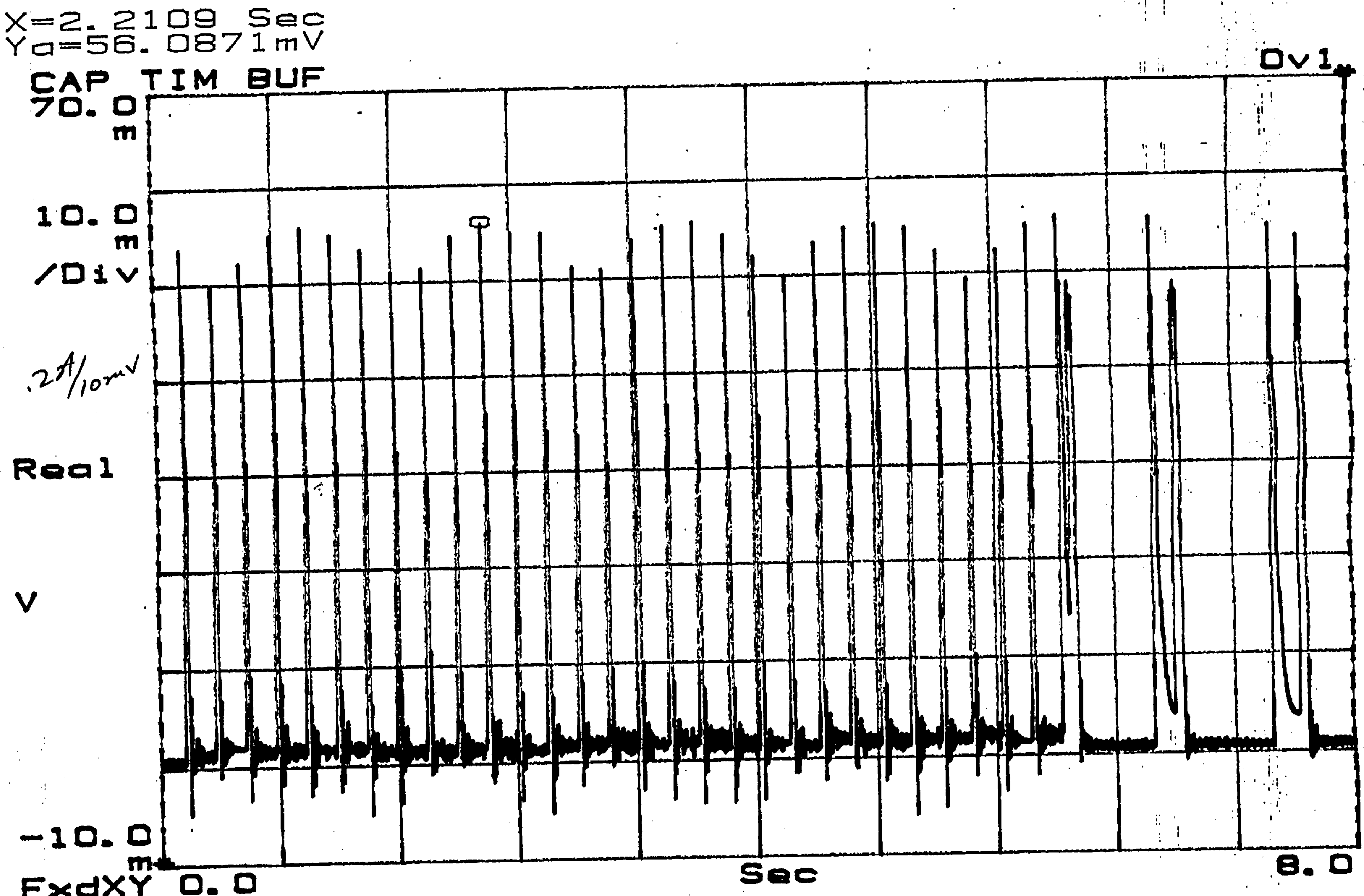
FINAL
Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

3-3-00
Customer Representative (Flight Hardware Only) Date

3/3/00
Test Systems Engineer Date

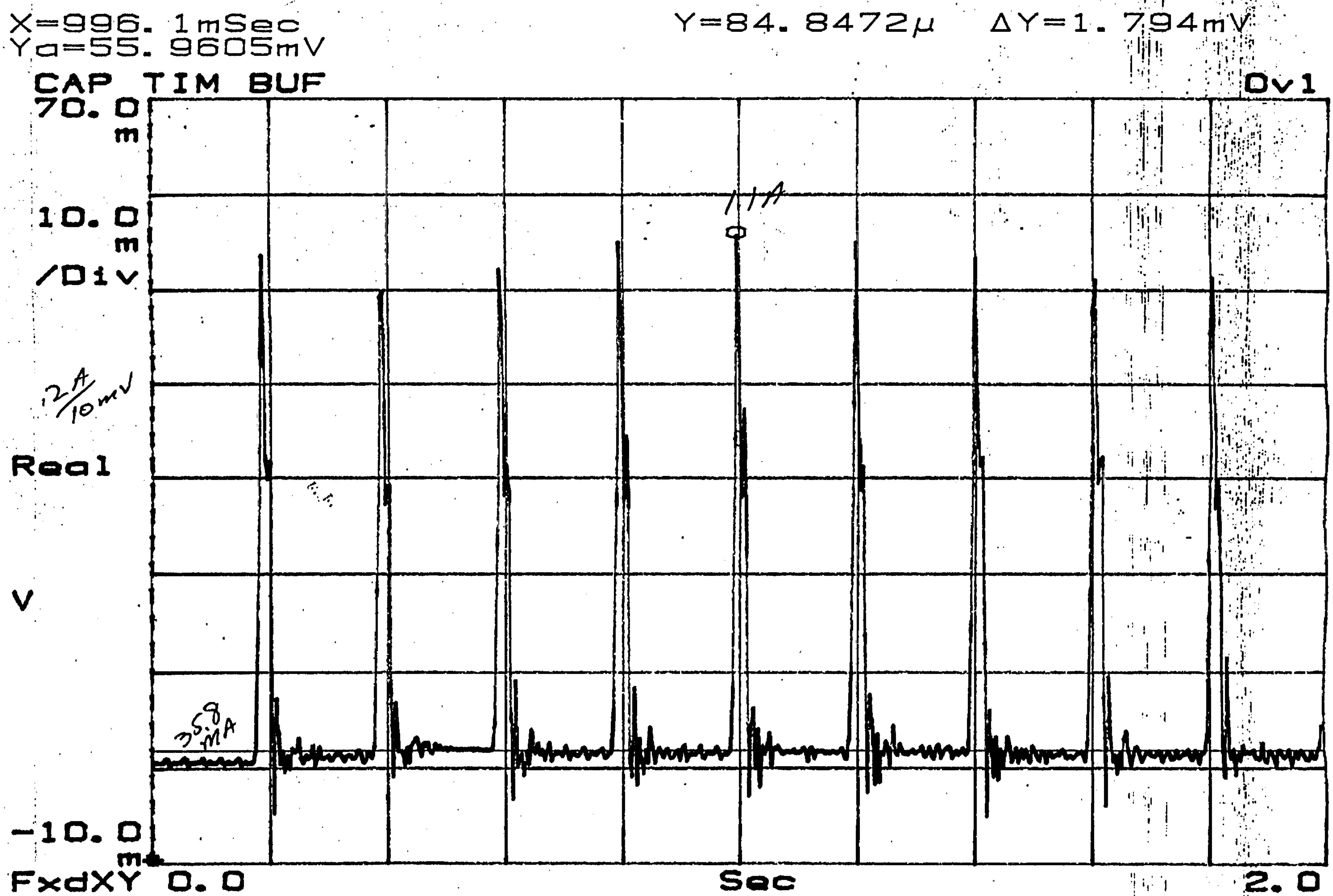
7A 194 3/3/00
Quality Control Date



FINAL CPT

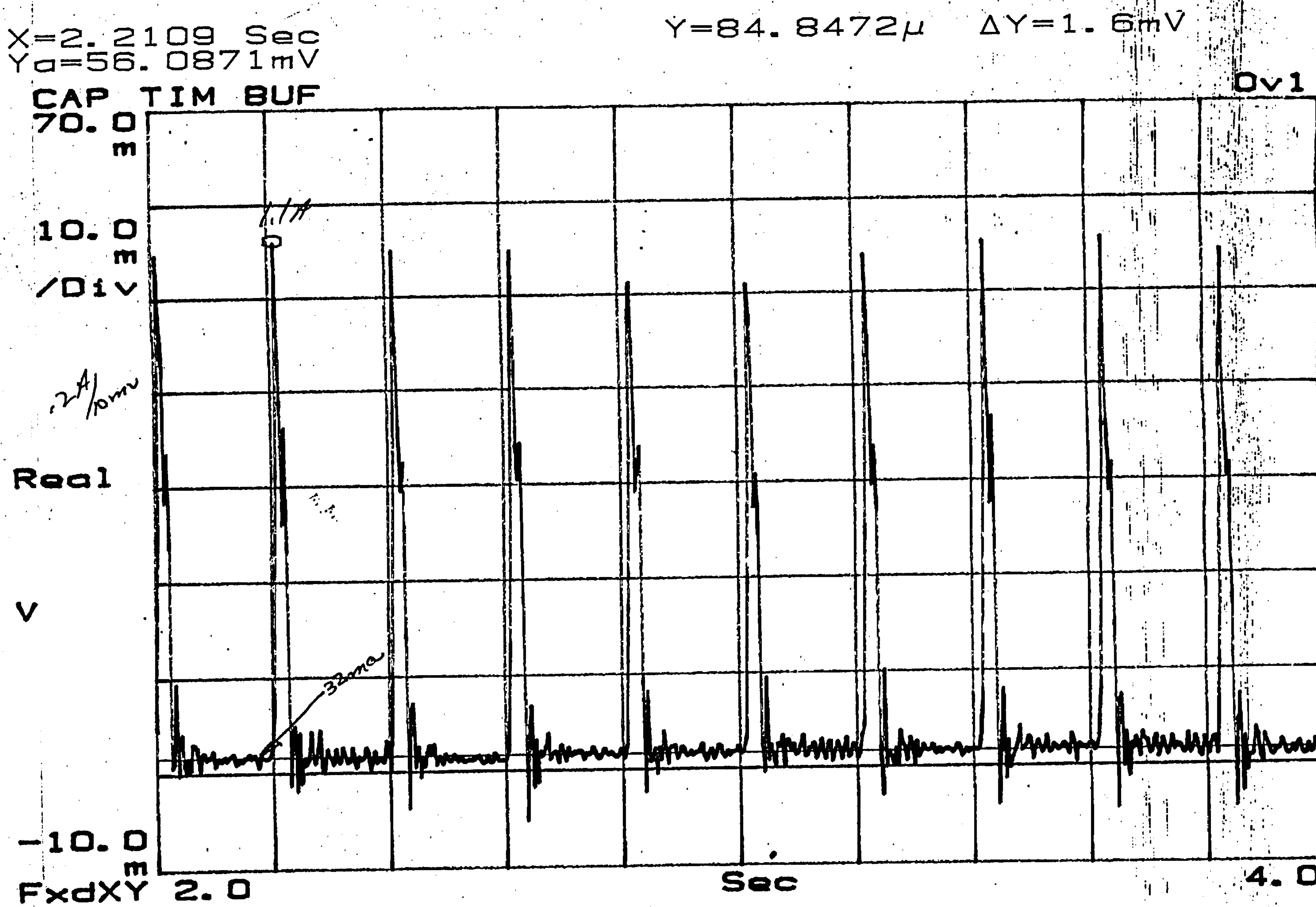
TEST ENG: R. Hail DATE 3/3/00

S/O: 373237 OP: 0830



FINAL RPT.

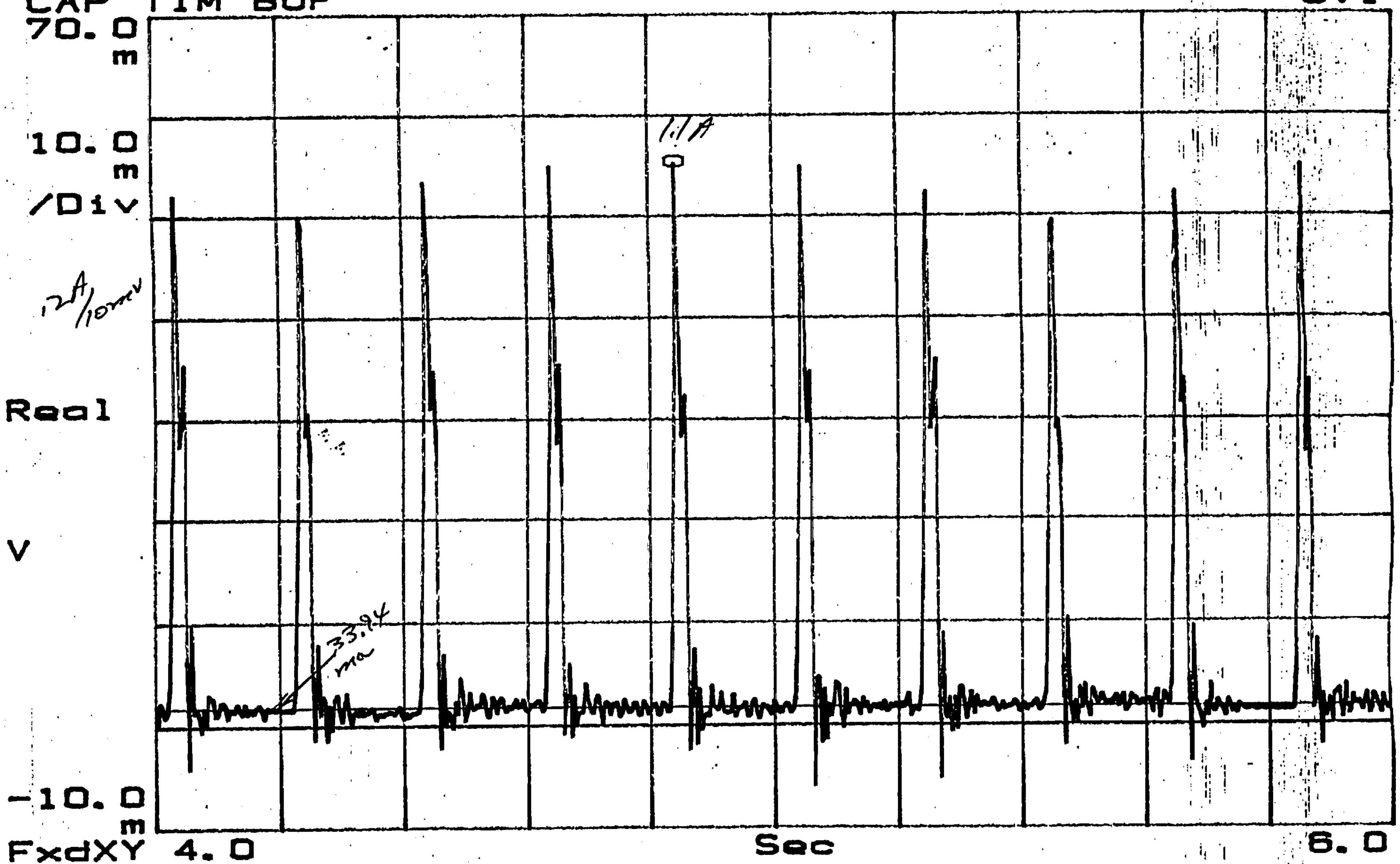
TEST ENG: [signature] DATE 3/3/06



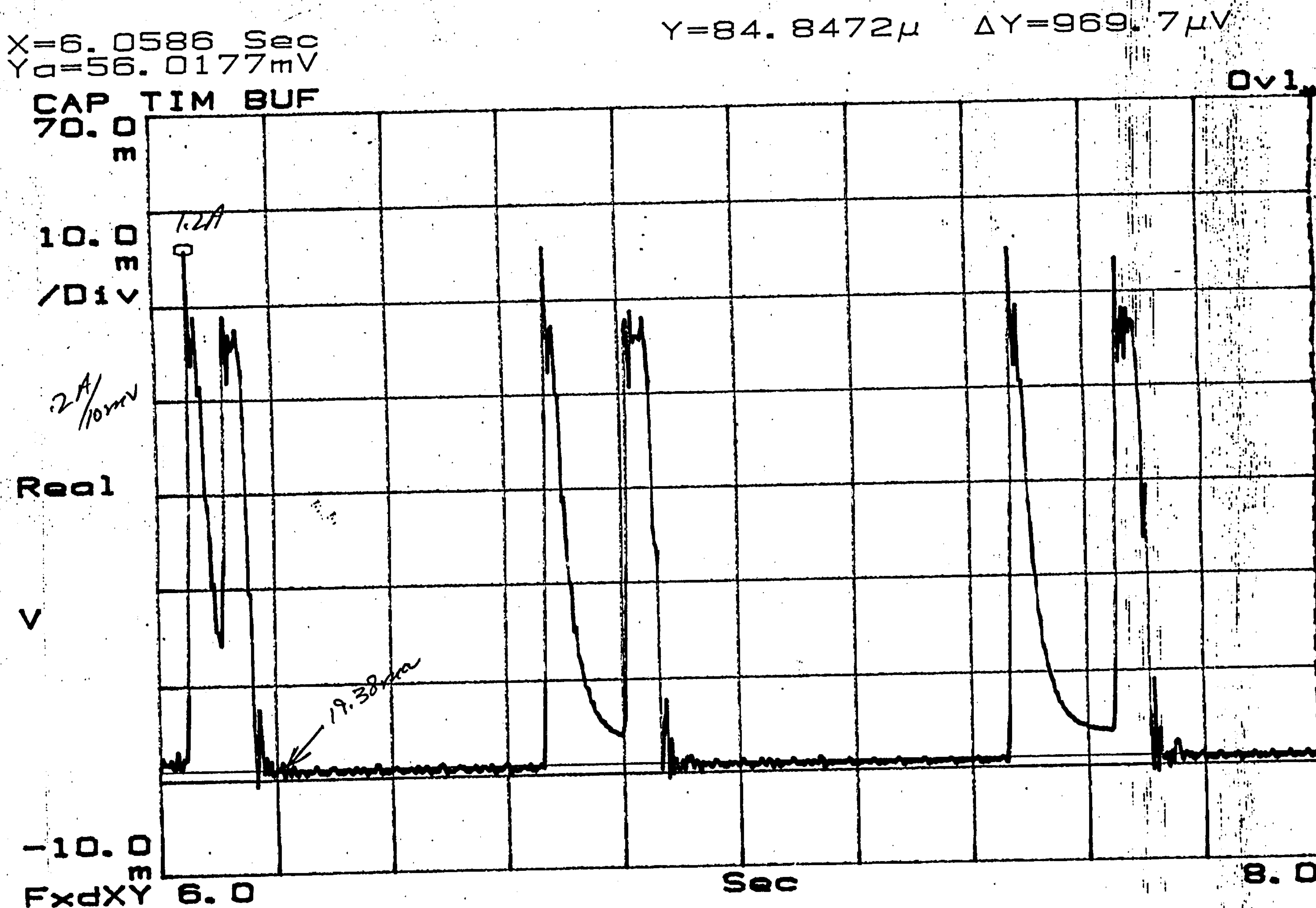
TEST ENG: R. H.

DATE 3/3/60

X=4.8437 Sec Y=84.8472μ ΔY=1.697mV
Ya=55.4031mV
CAP TIM BUF



FINAL RPT TEST ENG: R. Heil DATE 3/3/00

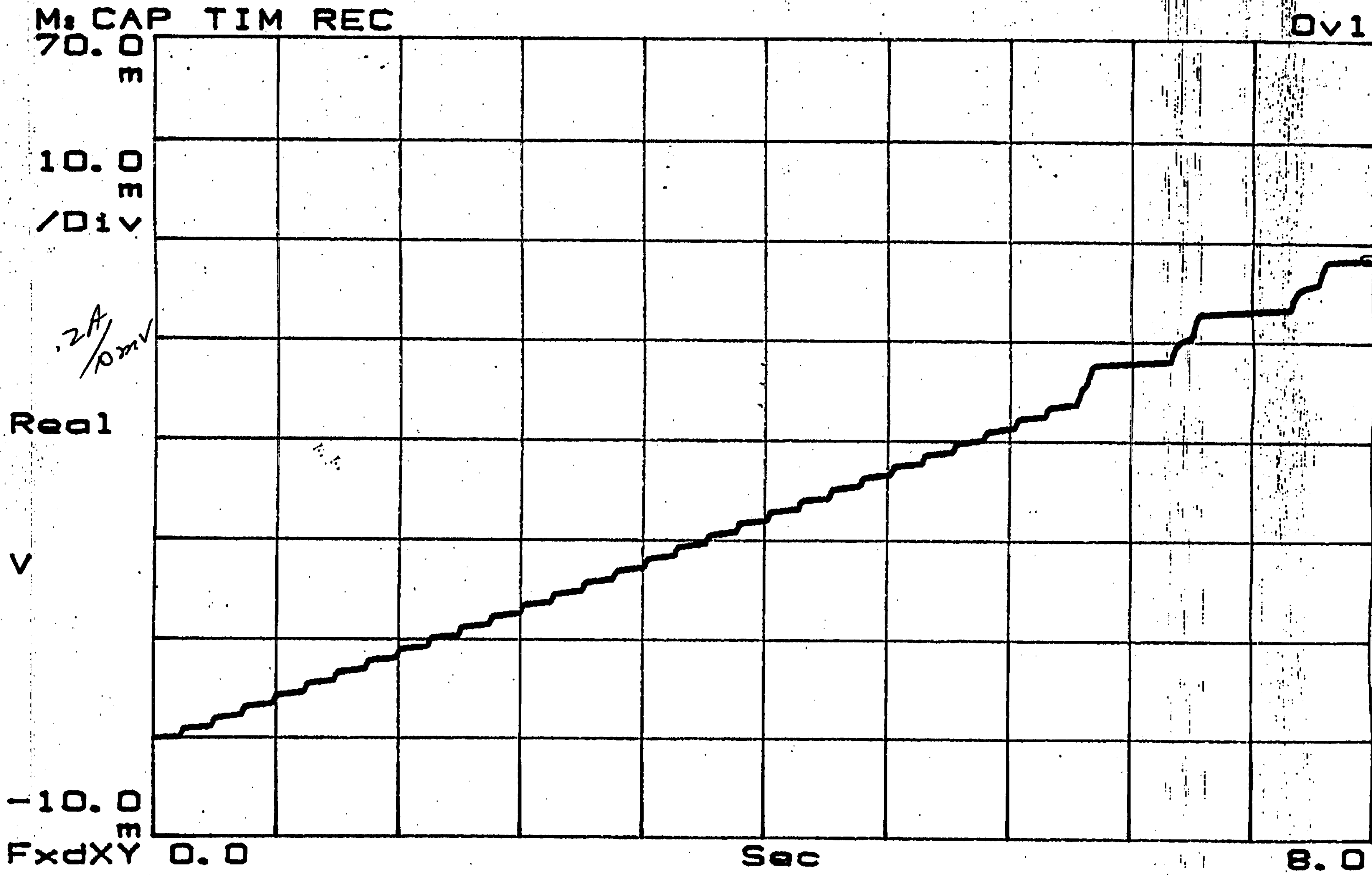


FINAL CPT.

TEST ENG: R. Haig DATE 3/3/00

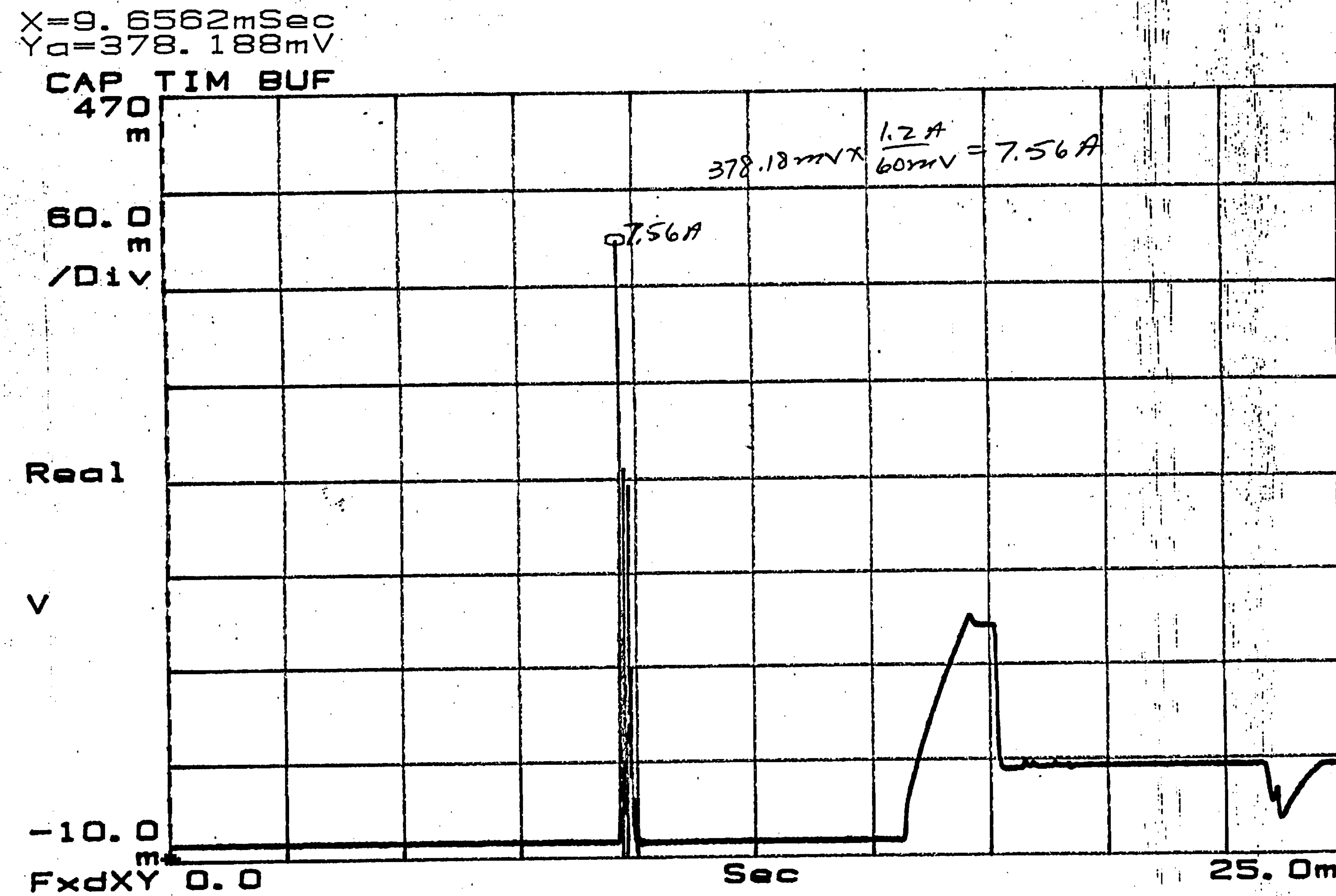
X=7.9961 Sec
Ya=48.3547mV

$48.35 mV \times \frac{.2A}{10mV} \times \frac{1}{8s} = 120.87 ma.$



P.3.2.4.2.2.5

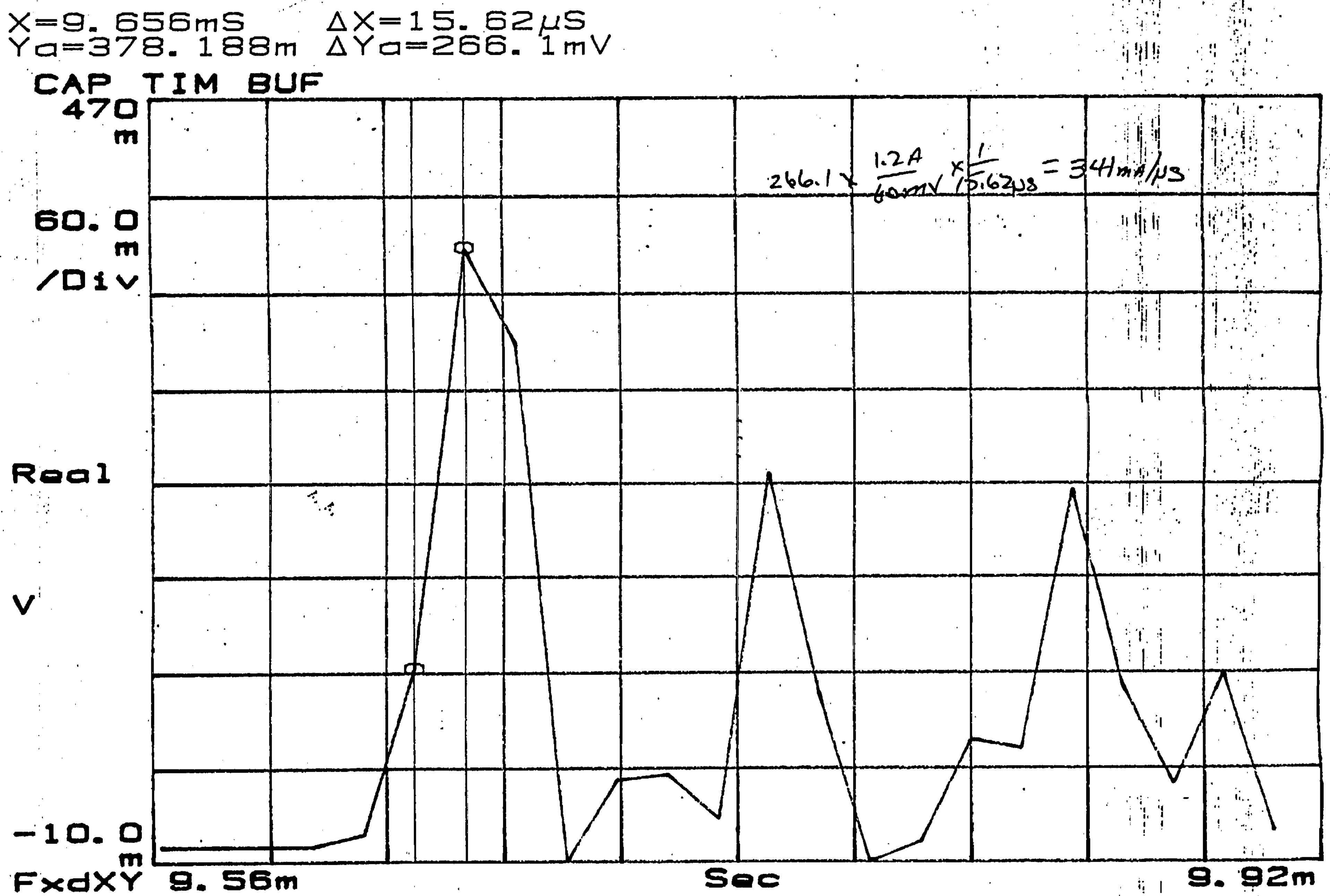
TEST ENG. [illegible] DATE [illegible]



P.3.2.4.2.2.6
FINAL CPT

TEST ENG:

DATE



P. 3.2.4.2.2.6

FINAL REPORT

TEST ENG: R. Hil DATE 3/3/00

TEST DATA SHEET 4 (Sheet 1 of 2)
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.6)

Paragraph	Parameter	Measured or Calculated	Required	Pass/ Fail
3.2.4.2.2.1	From -0.1 to two seconds			
	Peak Current = I_p	1.1 Amps	1.3 amps max	P
3.2.4.2.2.2	From 2 to 4 seconds			
	Peak Current = I_p	1.1 Amps	1.3 amps max	P
3.2.4.2.2.3	From 4 to 6 seconds			
	Peak Current = I_p	1.1 Amps	1.3 amps max	P
3.2.4.2.2.4	From 6 to 8 seconds			
	Peak Current = I_p	1.2 Amps	1.3 amps max	P
3.2.4.2.2.5	Eight Sec. Integrated Current Measurement:			
	Current	12087 mA	None	P
3.2.4.2.2.6	Turn-on Transient:			
	dI/dT	341 mA/µs	744 mA/µs *	P
	Peak Current = I_p	7.5 Amps	11.5 Amps	P

* Refer to Figure 9.

Bus current during the I/H, D period

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.1	From -0.1 to 2 secs	~~32~~ 37.8 R.H. mA	N/A
3.2.4.2.2.2	From 2 to 4 secs	32 mA	N/A
3.2.4.2.2.3	From 4 to 6 secs	33.94 mA	N/A
3.2.4.2.2.5	From 6 to 8 secs	19.38 mA	N/A

Circle Test: CPT LPT
FINAL

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Haigh 3/3/00
Test Systems Engineer Date

[signature] 3-3-00
Customer Representative Date
(Flight Hardware Only)

[signature] QA 194 3/3/00
Quality Control Date

TEST DATA SHEET 4 (Sheet 2 of 2)
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.7)

Bus current during warm cal, cold cal, & Nadir

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.7 (2)	Warm cal	16.90 mA	N/A
3.2.4.2.2.7 (3)	Cold cal	17.71 mA	N/A
3.2.4.2.2.7 (4)	Nadir	29.30 mA	N/A
3.2.4.2.2.7 (5)	Warm cal (motors off)	0.0 mA	N/A

FINAL
Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Hait 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

TEST DATA SHEET 5
+28 V Analog Telemetry Bus (Paragraph 3.2.4.2.3)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	+28 V ATB Bus Voltage (V_{at}) (Measured)	28.38 Volts	28.0 ±0.5	P
4	Av. Current (I_a)	1.80 mA	7 mA max	P
5	+28 V ATB Operating Power = I_a X V_{at}	51.08 mW	200 mW max	P

Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Hail 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

TEST DATA SHEET 6
+10 V Interface Bus Voltage (Paragraph 3.2.4.2.4)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	Av. Current (I_a)	7.62 mA	10 mA max	P
3	+10 V Interface Bus (V_{ib}) (Measured)	9.08 Volts	9.0 ±1.0 V	P
4	+10 V Interface Bus Power = I_a X V_{ib}	69.18 mW	100 mW max	P

FINAL
Circle Test: CPT LPT

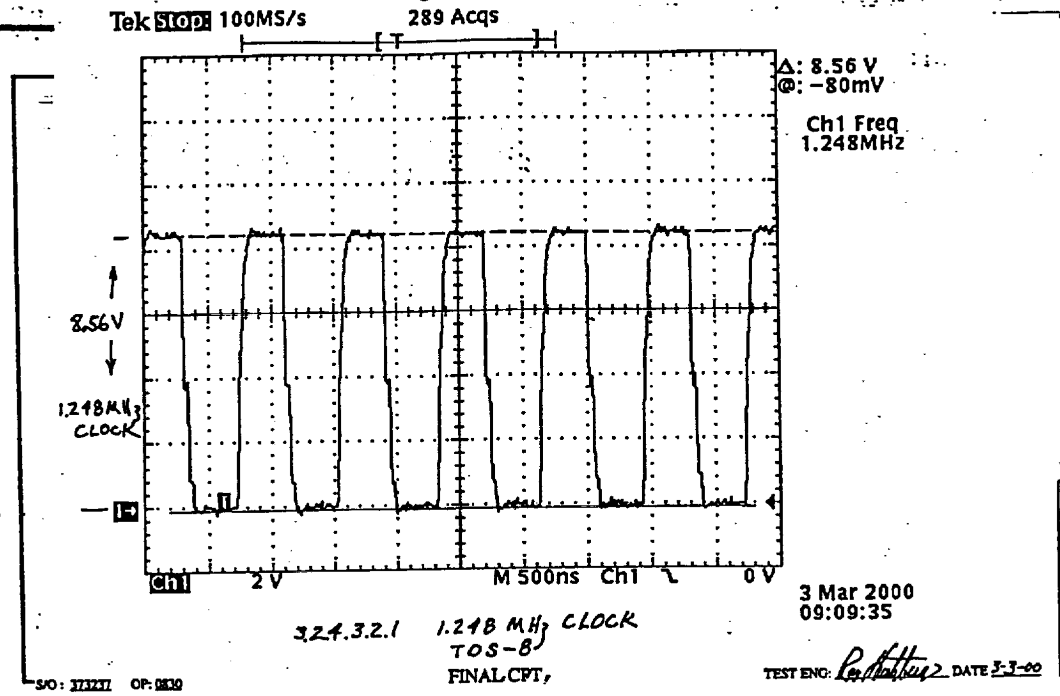
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Haight 3/3/00
Test Systems Engineer Date

R. D[illegible] 3-3-00
Customer Representative (Flight Hardware Only) Date

[illegible] 7A 194 3/3/00
Quality Control Date

TEST DATA SHEET 8
1.248 MHz Clock Signal Verification (Paragraph 3.2.4.3.2.1)



Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
5	Clock Frequency	1.248 MHz	1.248 ±10%	P
	Clock Amplitude	8.56 Volts	9.0 ±1.0 V	P

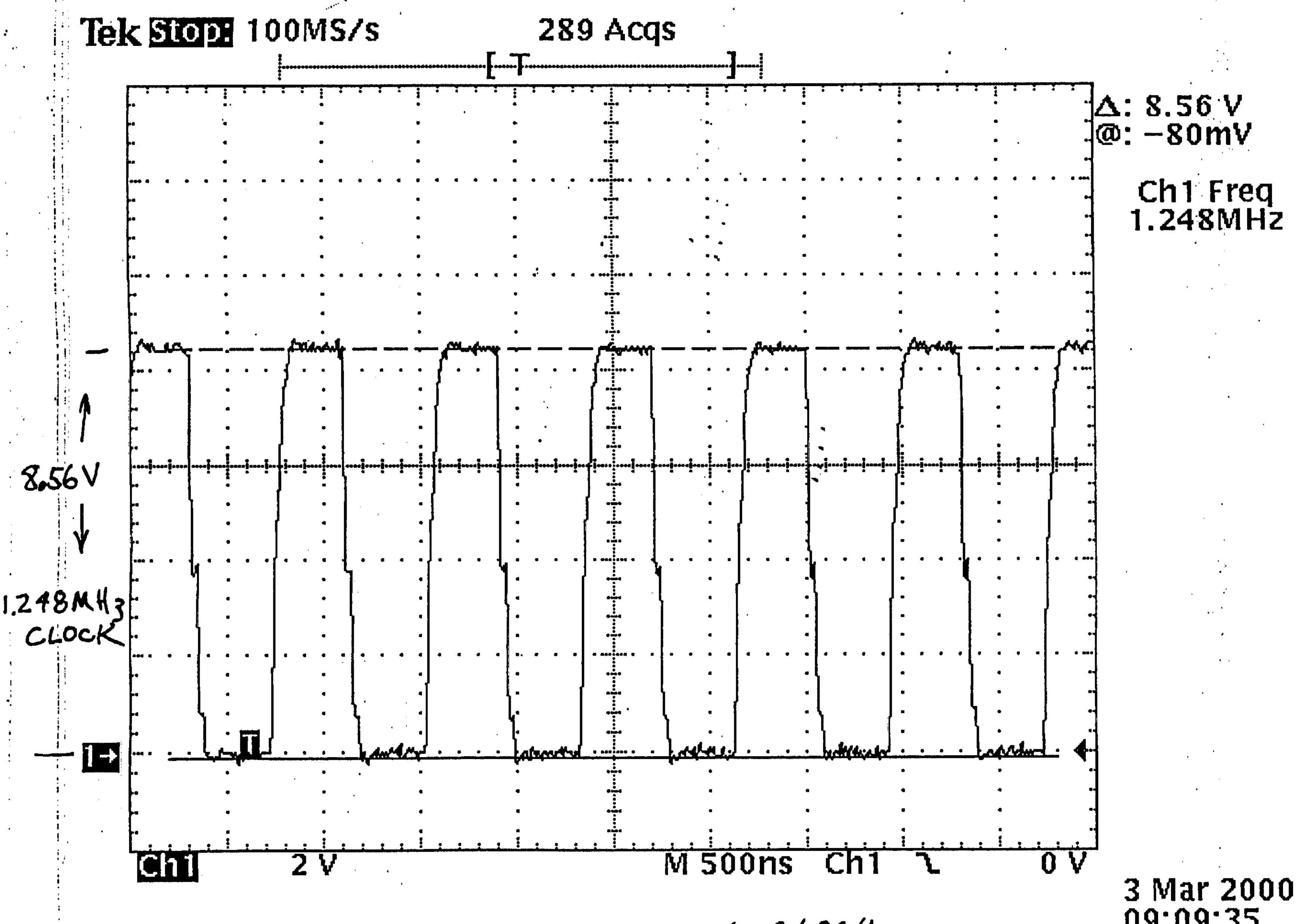
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer 3-3-00 Date

Customer Representative (Flight Hardware Only) 3-3-00 Date

Quality Control 7A 194 3/3/00 Date



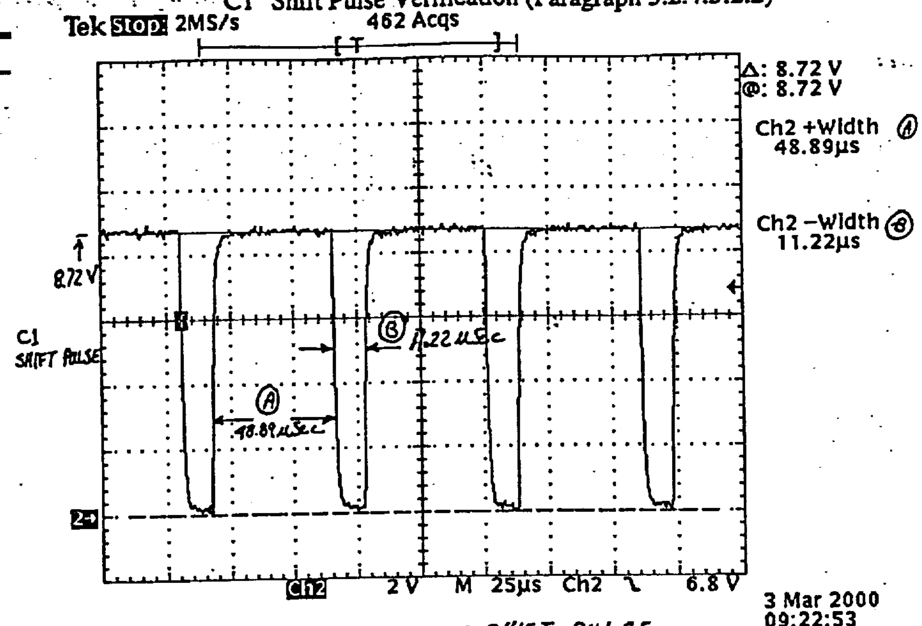
3.24.3.2.1 1.248 MHz CLOCK TOS-8

FINAL CPT

TEST ENG: DATE 3-3-00

TEST DATA SHEET 9

"C1" Shift Pulse Verification (Paragraph 3.2.4.3.2.2)



3.2.4.3.2.2 C1 SHIFT PULSE
TDS-9

S/O: 373237 OP: 0830 FINAL CPT TEST ENG: [signature] DATE 3-3-00

	Calculated		Pass/ Fail
Pulse Timing (A) *	48.89 µs	48 µs ± 10%	P
Pulse Timing (B) *	11.22 µs	12 µs ± 10%	P
Pulse Amplitude	8.72 Volts	9.0 ± 1.0 V	P

* Refer to Figure 19 for location of the pulse timing A and B.

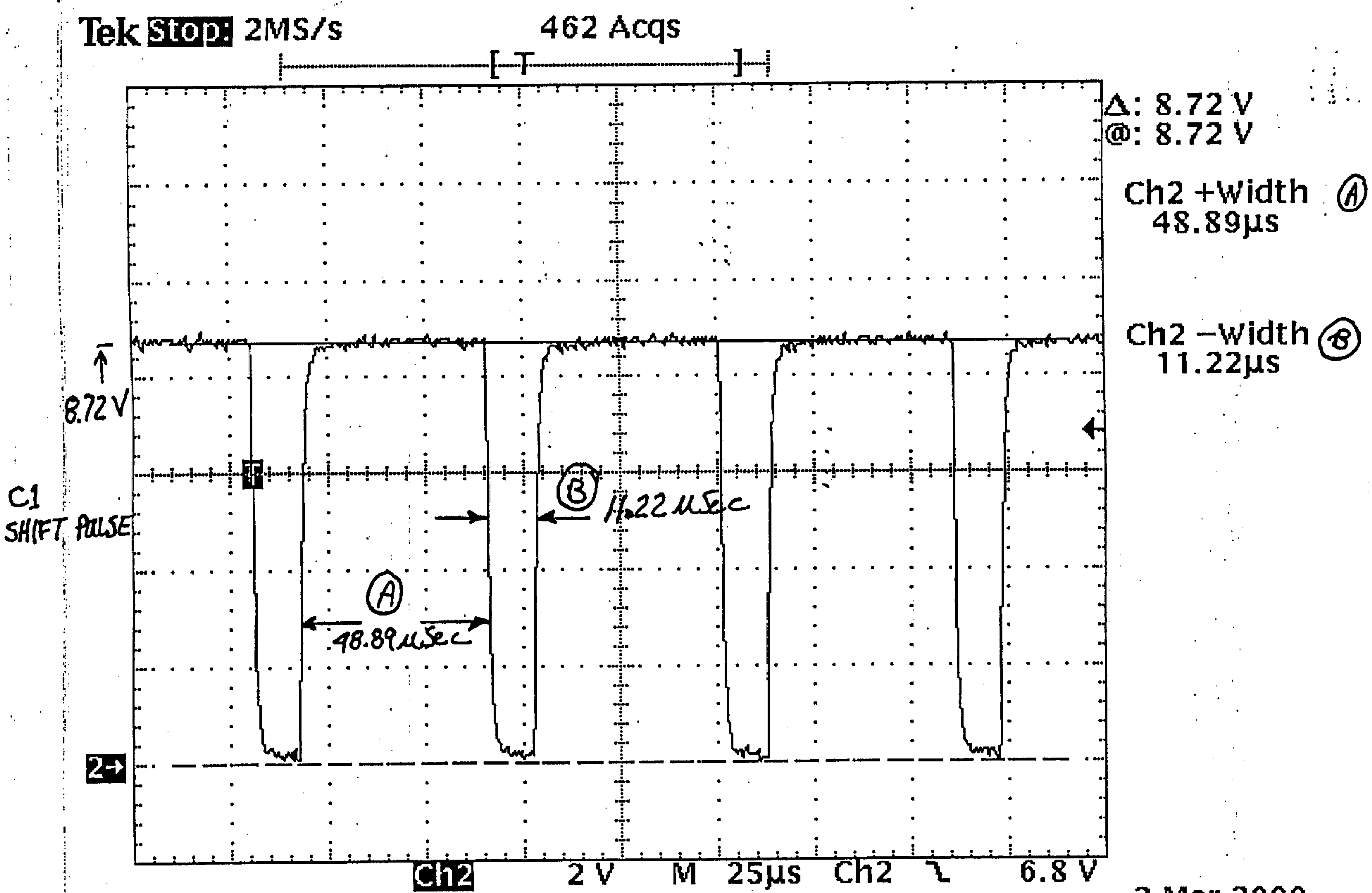
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

[signature] 3-3-00
Test Systems Engineer Date

[signature] 3-3-00
Customer Representative (Flight Hardware Only) Date

[signature] 7A 194 3/3/00
Quality Control Date



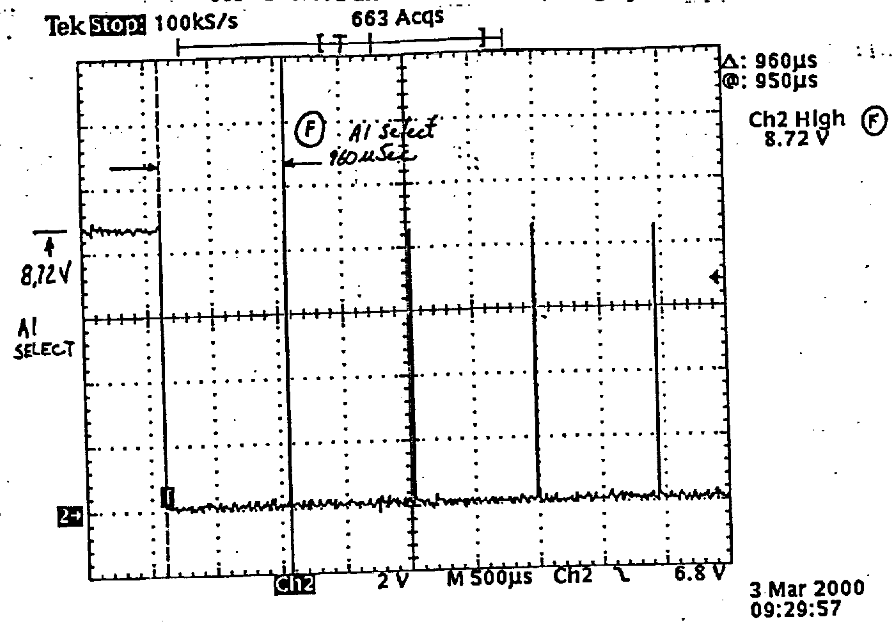
3.2.4.3.2.2 C1 SHIFT PULSE

TDS- 9

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

TEST DATA SHEET 10
"A1" Select Pulse Verification (Paragraph 3.2.4.3.2.3)



3.2.4.3.2.3 A1 SELECT PULSE

FINAL CPT, TDS-10

TEST ENG: [signature] DATE 3-3-00

S/O: 373237 OP: 0820

Parameter	Measured/ Calculated	Required	Pass/ Fail
Select Pulse Timing (F) *	960 µs	961.5 µs± 10%	P
Select Pulse Amplitude	8.72 Volts	9.0 ±1.0 V	P

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

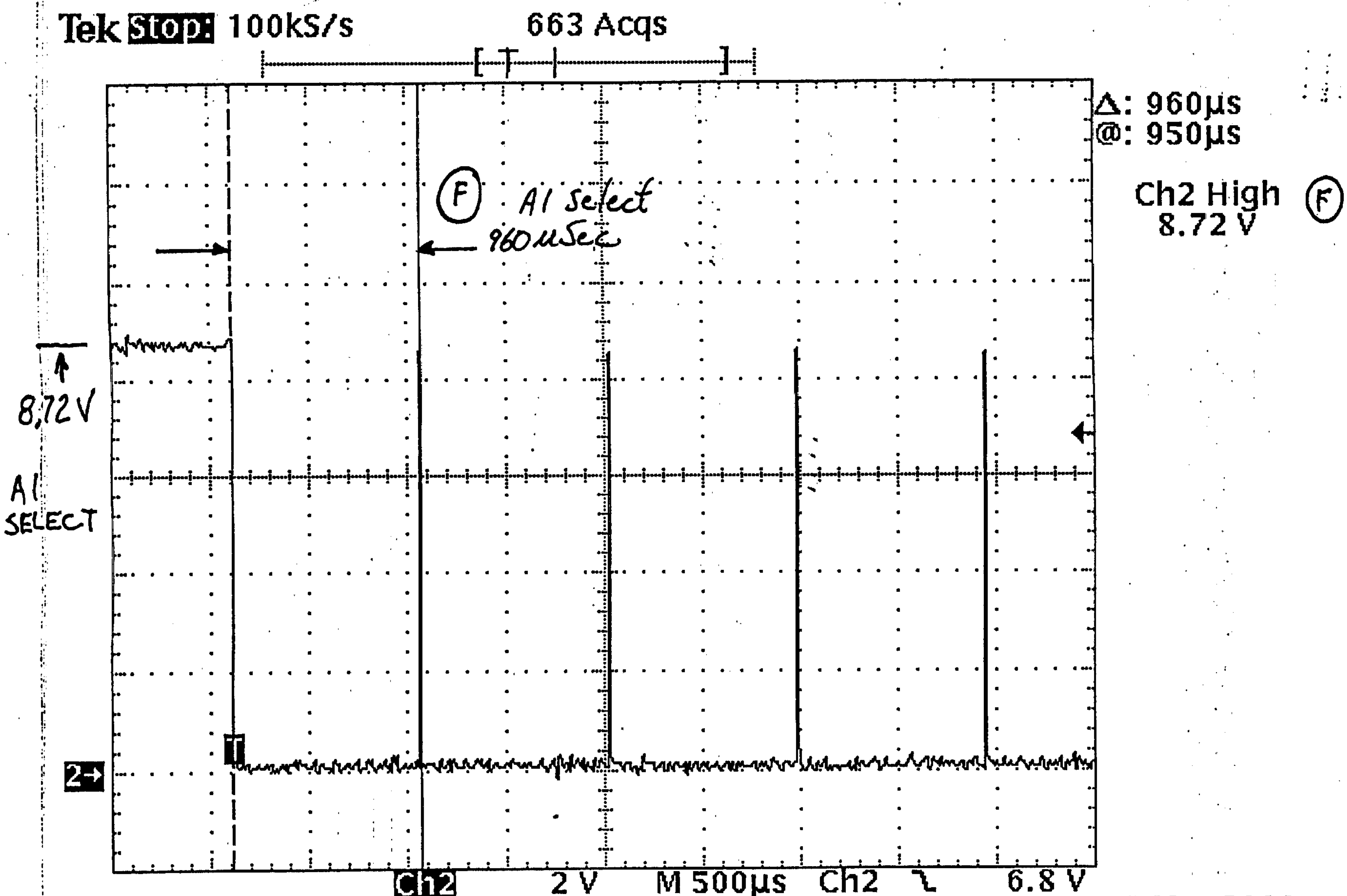
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

[signature] 3-3-00
Test Systems Engineer Date

[signature] 3-3-00
Customer Representative Date
(Flight Hardware Only)

[signature] 7A 194 3/3/00
Quality Control Date



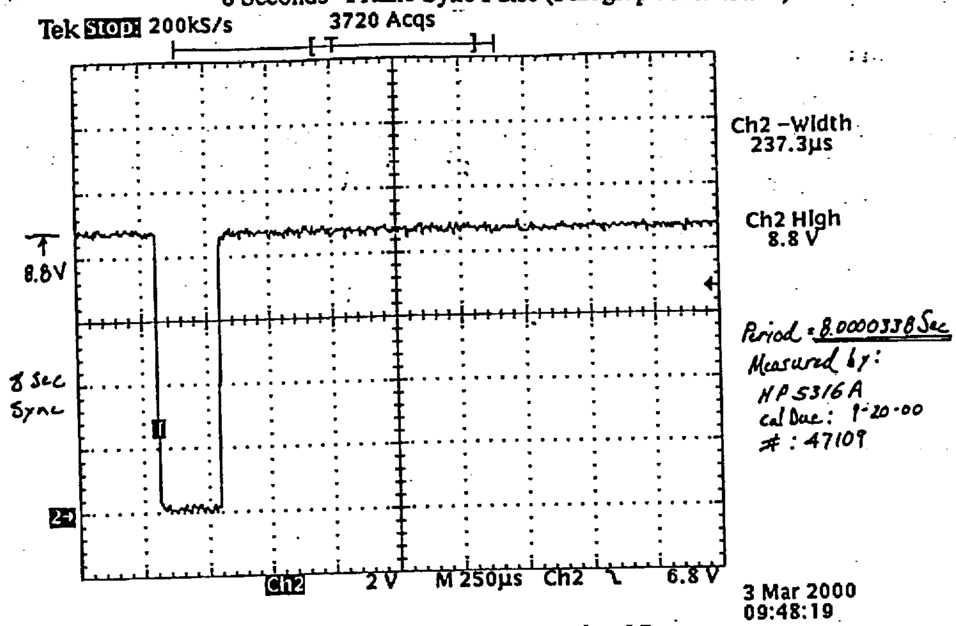
3 Mar 2000
09:29:57

3.2.4.3.2.3 A1 SELECT PULSE

FINAL CPT TDS-10

TEST ENG: Ray Hultberg DATE 3-3-00

TEST DATA SHEET 11
"8 Seconds" Frame Sync Pulse (Paragraph 3.2.4.3.2.4)



3.2.4.3.2.4 8 Sec FRAME SYNC PULSE

S/O: 373237 OP: 0830 FINAL CPT TDS-11 TEST ENG: [signature] DATE: 3-3-00

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
1*	Frame Sync Pulse Timing (G)*	8.0000338 Sec	8 Sec ±10%	P
	Frame Sync Pulse Timing (C)*	237.3 μs	240.4 μs ±10%	P
	Frame Sync Pulse Amplitude	8.8 Volts	9.0 ±1.0 V	P

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

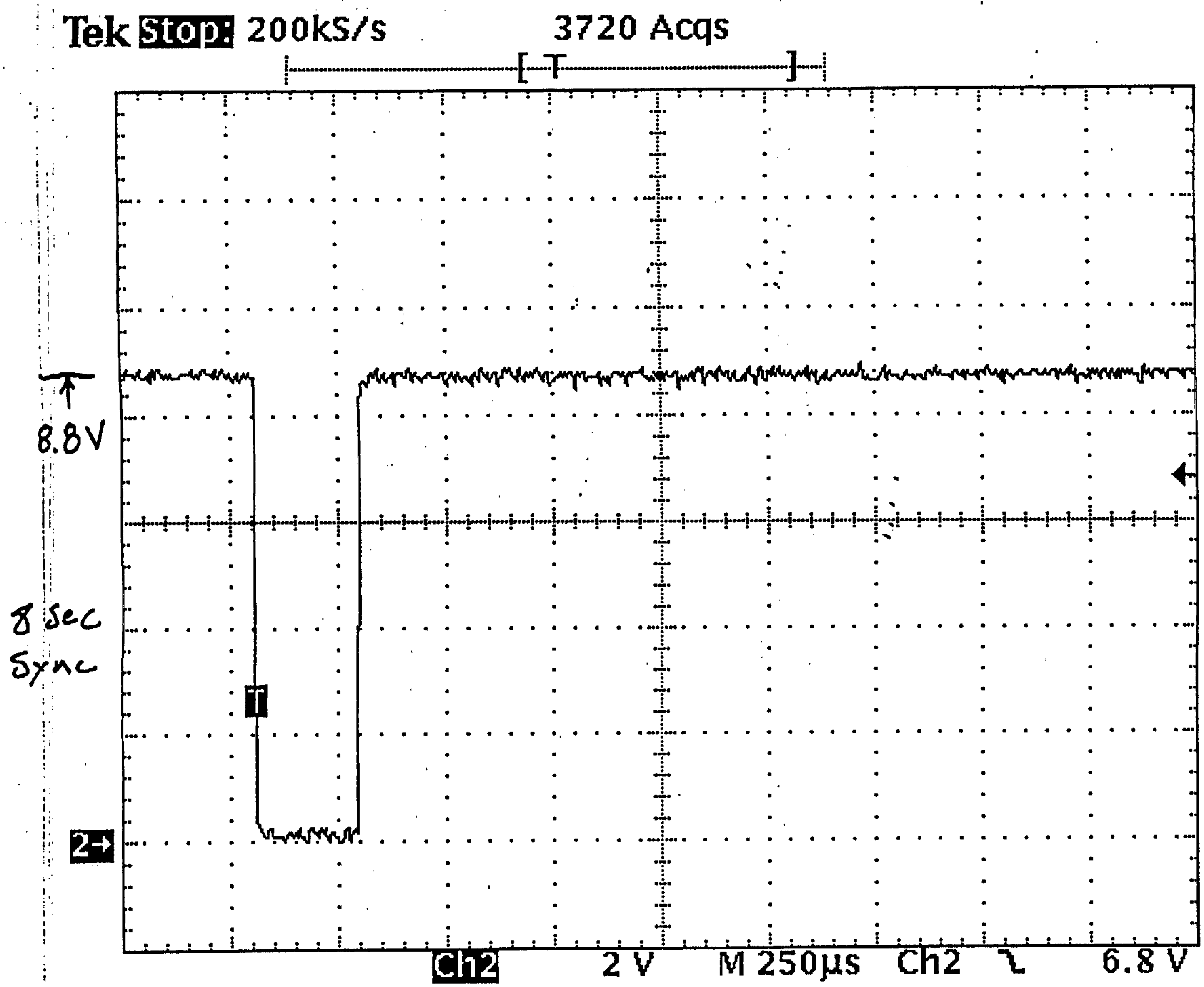
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720   Shop Order: 373237   S/N: 108

Test Systems Engineer [signature]   Date 3-3-00

Customer Representative (Flight Hardware Only) [signature]   Date 3-5-00

Quality Control [signature] QA 194   Date 3/3/00



Ch2 –Width
237.3µs

Ch2 High
8.8 V

Period = 8.0000338 Sec
Measured by:
HP 5316A
cal Due: 9-20-00
#: 47109

3 Mar 2000
09:48:19

3.2.4.3.2.4 8 Sec FRAME SYNC PULSE

FINAL CPT TDS-11

TEST ENG: [signature] DATE 3-3-00

TEST DATA SHEET 12 (Sheet 1 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

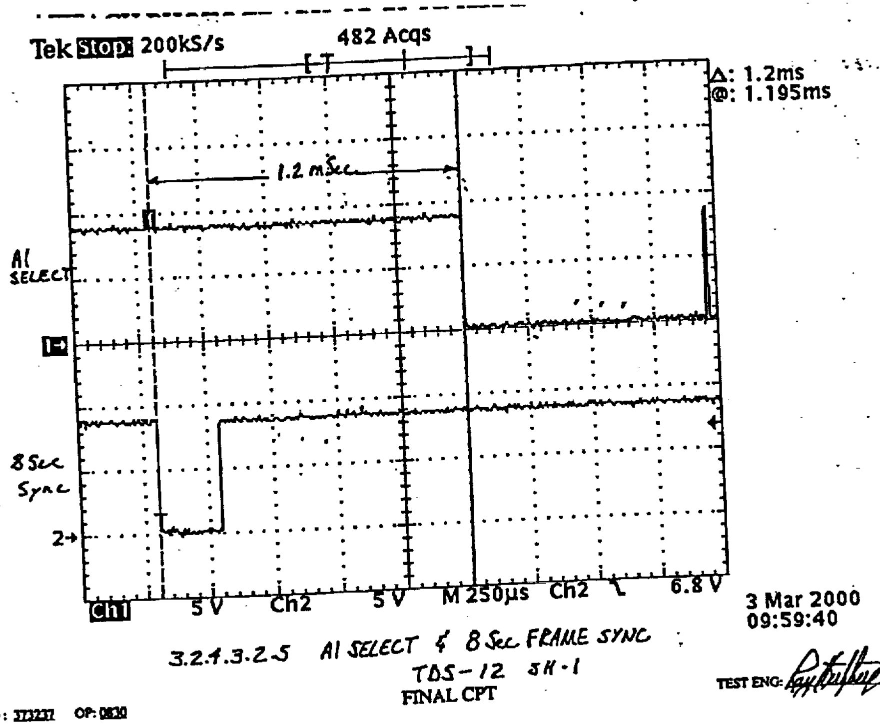
A1 Select pulse and the 8 seconds Frame sync pulse.

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

TIME MEASURED: 1.2 mSec

TIME REQUIRED: 1.2 ms ±10%

PASS/FAIL PASS



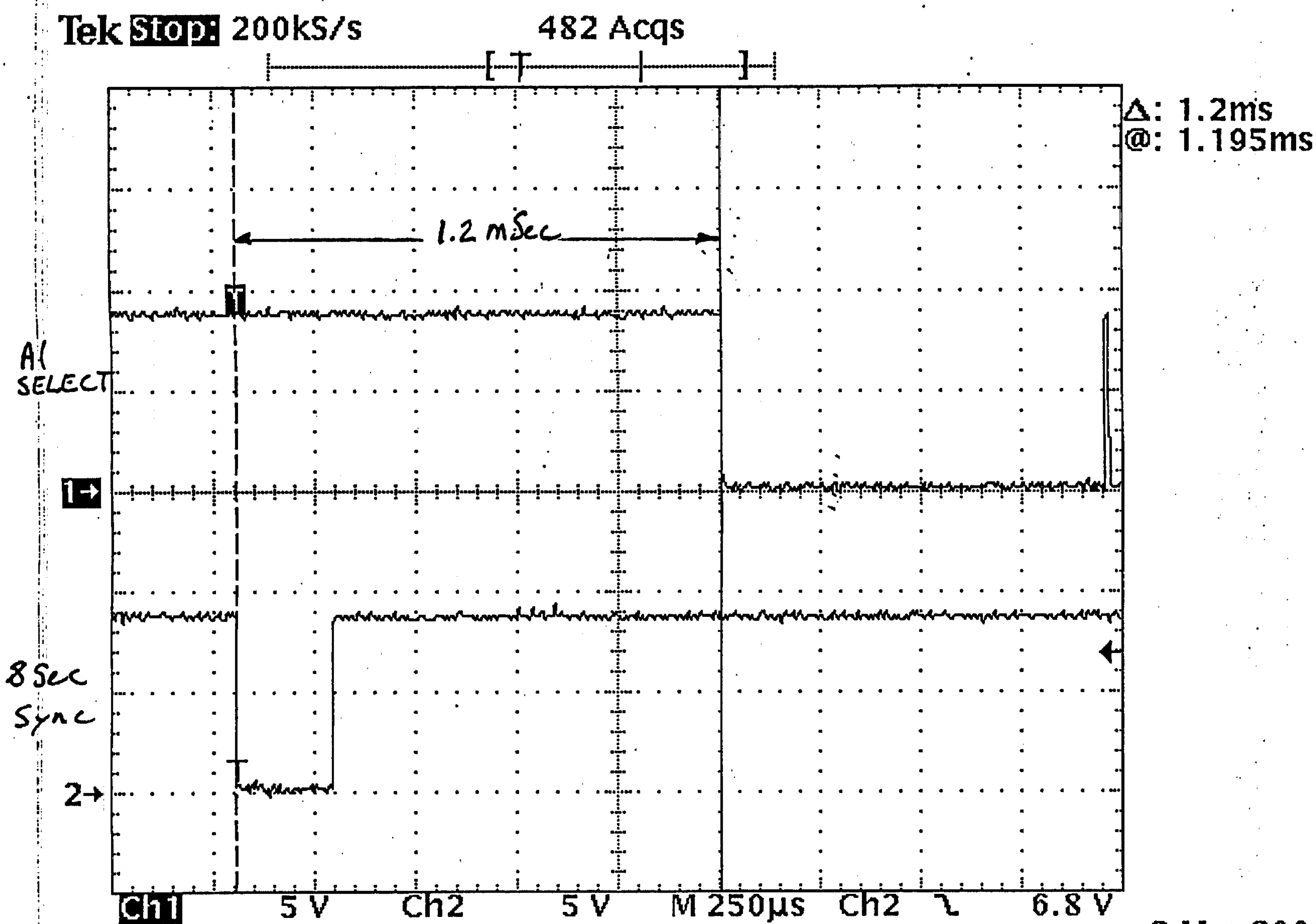
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N 108

Test Systems Engineer 3-3-00 Date

Customer Representative (Flight Hardware Only) 3-3-00 Date

Quality Control 3/3/00 Date



3 Mar 2000
09:59:40

3.2.4.3.2.5 Al SELECT & 8 Sec FRAME SYNC

TDS-12 SH-1

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

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

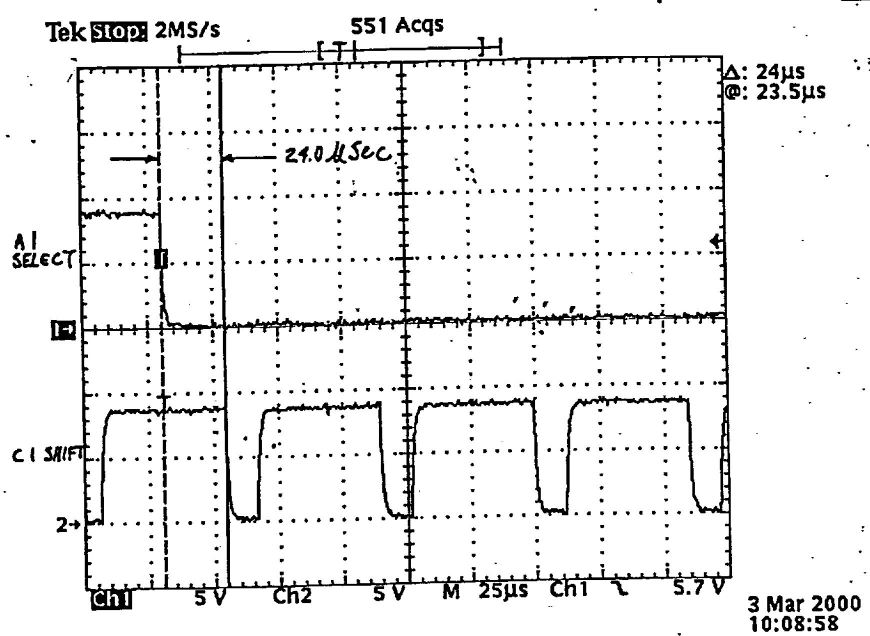
A1 Select pulse and the C1 Shift pulse.

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

TIME MEASURED: 24.0 µSec

TIME REQUIRED: 24 µs ±1 µs

PASS/FAIL PASS



3.2.4.3.2.5 A1 SELECT & C1 SHIFT

D: 373237 OP: 0830 FINAL CPT TDS-12 SH2 TEST ENG: [signature] DATE 3-3-00

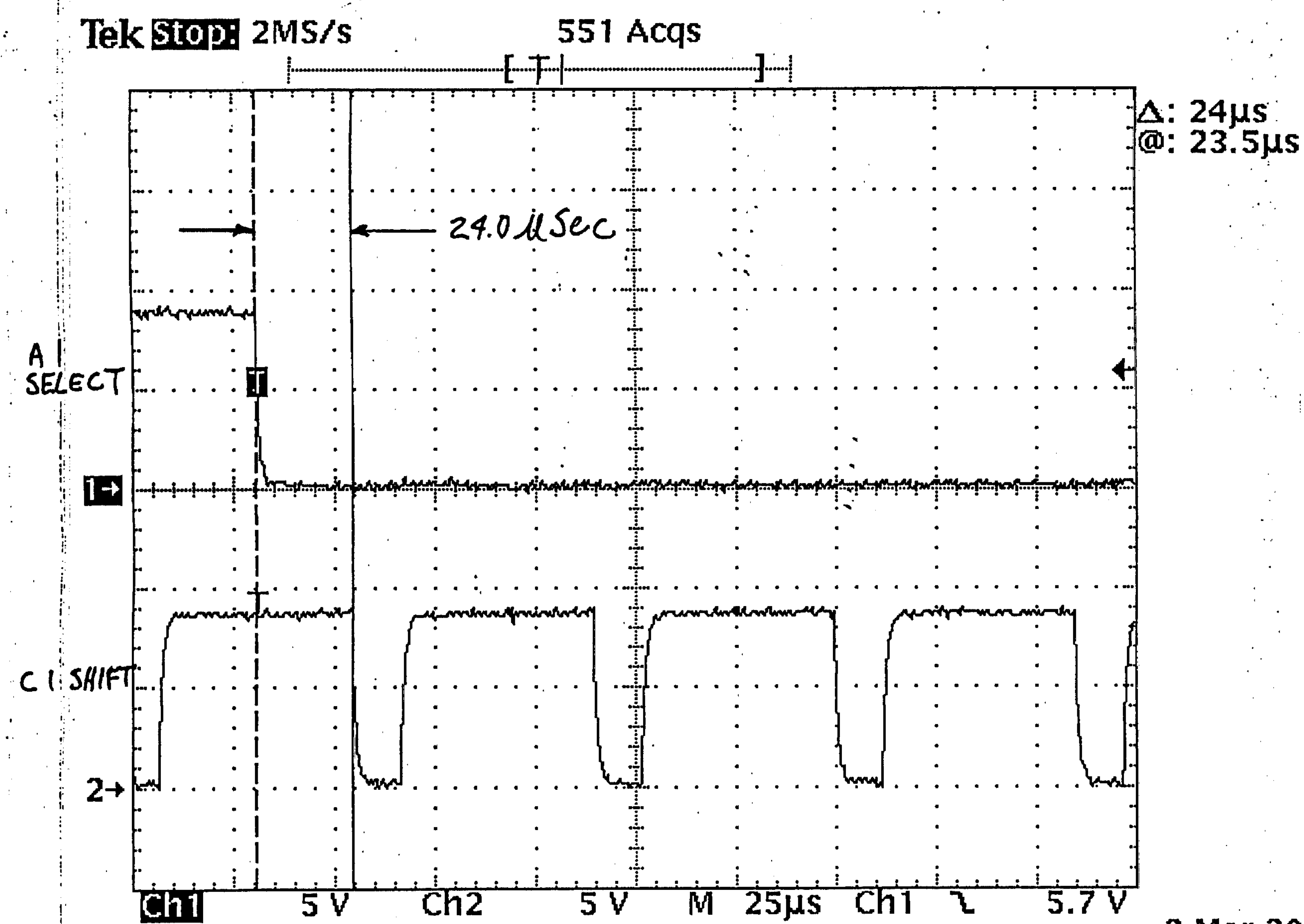
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

[signature] 3-3-00
Test Systems Engineer Date

[signature] 3-3-00
Customer Representative (Flight Hardware Only) Date

[signature] 7A 194 3/3/00
Quality Control Date



3 Mar 2000
10:08:58

3.2.4.3.2.5 A1 SELECT & C1 SHIFT

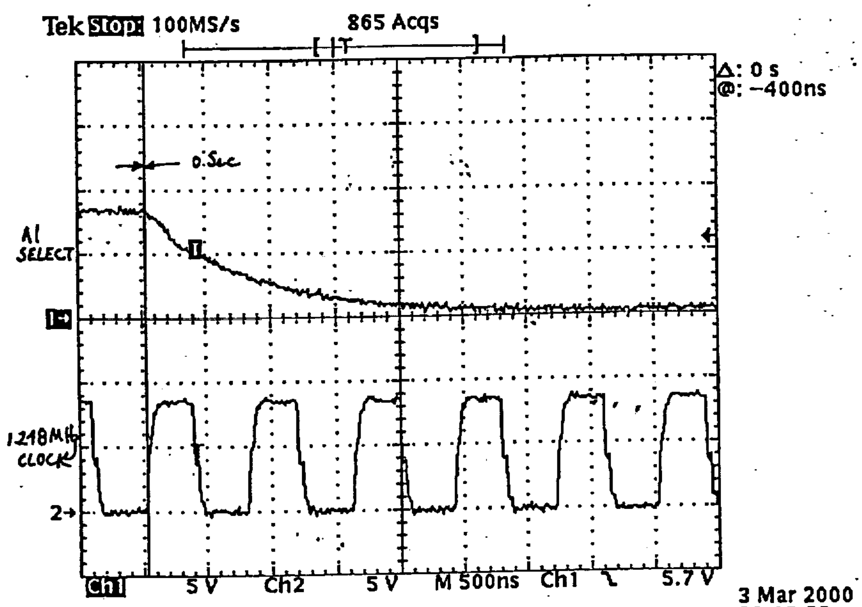
AE-26156/3C
6 Apr 99

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



3.2.4.3.2.5 A1 SELECT & 1.248 MHz CLOCK
TDS-13

D: 373237 OP: 0830

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

Circle Test: FINAL CPT LPT

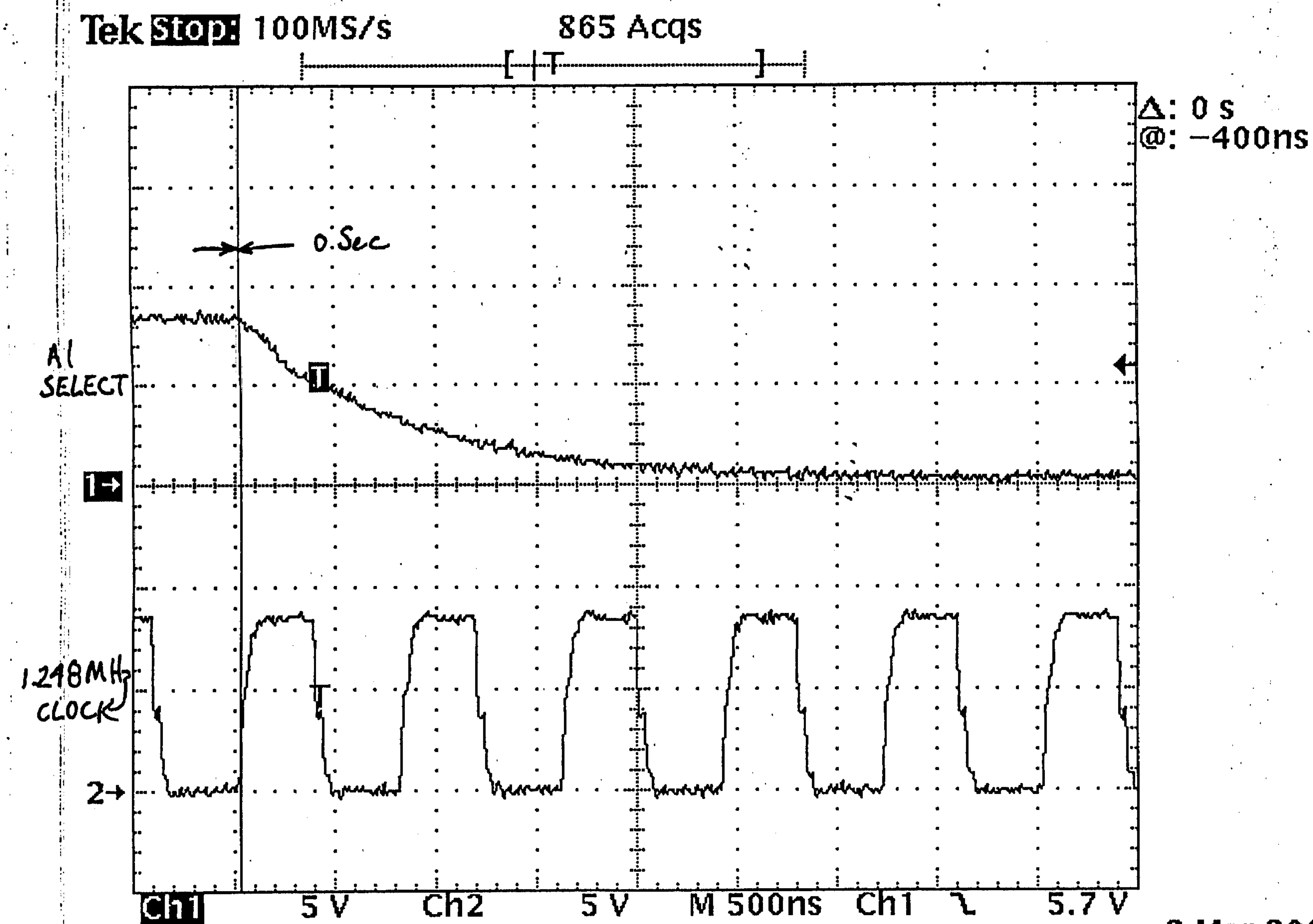
METSAT/AMSU-A1 System P/N IS-1331720

Shop Order: 373237 S/N: 108

[signature] 3-3-00
Test Systems Engineer Date

[signature] 3-3-00
Customer Representative Date
(Flight Hardware Only)

[signature] 194 3/3/00
Quality Control Date



3 Mar 2000
10:18:28

3.2.4.3.2.5 A1 SELECT & 1.248 MHz CLOCK

TDS-13

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

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)

Test	Digital-B Commands Verification Via STE			Visual Inspection		Pass/Fail
	Command	Observed	Required	Observed	Required	
3.2.4.3.3.1 Module Totally Off	Scanner A1-1	OFF	OFF	W.C.	Antenna pointing to warm load.	P
	Scanner A1-2	OFF	OFF	W.C	Antenna pointing to warm load.	P
	Module Power		Disconnect	N/A	N/A	
	Survival Htr. Power.	OFF	OFF		28 V supply current=0	P
3.2.4.3.3.2 Survival Heater Power	Survival Heater ON	ON	ON	N/A	N/A	P
	Survival Heater OFF	OFF..	OFF	N/A	N/A	P
3.2.4.3.3.3 Module Power Connect	Module Power	CONNECT	Connect	2.4A	+28 V DC current is between 0.5 and 3.2 amps.	P
3.2.4.3.3.4 PLL Power	PLLO#2	N/A	PLLO#2	N/A	N/A	
	PLLO#1	ON	PLLO#1	N/A	N/A	P

Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Harigl 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

TA 194 3/3/00
Quality Control Date

TEST DATA SHEET 15
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 1)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A1 Power	ON	ON	
	4 Scanner A2 Power	ON	ON	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 PLL Power	#1	PLL#1	
	10 Cold MSB	0	0	
	11 Cold LSB	0	0	

FINAL
Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 109

R. Hail 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative Date
(Flight Hardware Only)

7A 194 3/3/00
Quality Control Date

TEST DATA SHEET 16
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 2)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A1 Power	OFF	OFF	
	4 Scanner A2 Power	OFF	OFF	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 PLL Power	#1	PLLO#1	
	10 Cold MSB	0	0	
	11 Cold LSB	0	0	

Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Heid 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

Quality Control 3/3/00 Date

TEST DATA SHEET 17
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 3)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A1 Power	ON	ON	
	4 Scanner A2 Power	ON	ON	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 PLL Power	#1	PLLO#1	
	10 Cold MSB	0	0	
	11 Cold LSB	0	0	

FINAL

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Hal 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative Date
(Flight Hardware Only)

QA 194 3/3/00
Quality Control Date

TEST DATA SHEET 18
Scanner Positions Commands (Paragraph 3.2.4.3.3.6)

Test	Digital "B" Verification				Pass/Fail
	Step/Description		Observed	Required	
Scanner Position Commands	1-Warm Cal.		YES	YES	PASS
	2-Cold Cal. Pos.	MSB	0	0	
		LSB	1	1	
	3-Cold Cal. Pos.	MSB	1	1	
		LSB	0	0	
	4-Cold Cal. Pos.	MSB	1	1	
		LSB	1	1	
	5-Cold Cal. Pos.	MSB	0	0	
		LSB	0	0	
	6-NADIR		YES	YES	
	7-Warm Cal		YES	YES	

Circle Test: FINAL CPT LPT

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

Shop Order: 373237 S/N: 108

3-3-00
Customer Representative
(Flight Hardware Only)
Date

R. Hais 3/3/00
Test Systems Engineer
Date

TA 194 3/3/00
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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	Pass
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	29	*	
[III]	0005	Digital-B Data Byte 1	2	2	
	0006	Digital-B Data Byte 2	14	**	
	0007	Digital-B Data Byte 3	0	0	
	0008	Digital-B Data Byte 4	0	0	

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

	Binary	Decimal
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

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

Circle Test: CPT FINAL LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

K. Haist 3/3/00
Test Systems Engineer Date

3-3-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

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AMSU  A1-29 A1.EXE      FULL SCAN MODE    P1  3-MAR-00 03:21:56  SCAN NUMBER   144
[ 5 ] DIGITAL A DATA    ELEMENT 0000
[ 6 ] DIGITAL B DATA    ELEMENT   00
[ 7 ] ANALOG DATA       ELEMENT   00

                                        COMMANDS
[ 9 ]  MODULE POWER =          CONNECT   ANTENNA IN COLD CAL POSIT = NO   [ 15 ]
[ 10 ] SURVIVAL HEATER POWER =     OFF   ANTENNA IN NADIR POSITION = NO   [ 16 ]
[ 11 ] MODULE TOTALLY OFF =        ON    ANTENNA IN FULL SCAN MODE = YES  [ 17 ]
[ 12 ] SCANNER A1 - 1 POWER =      ON    PLL POWER =           PLLO # 1   [ 18 ]
[ 13 ] SCANNER A1 - 2 POWER =      ON    COLD CAL POSITION MSB =    ZERO  [ 19 ]
[ 14 ] ANTENNA IN WARM CAL POSIT = NO    COLD CAL POSITION LSB =    ZERO  [ 20 ]
        POWER [ 4 ]  ON
                     SCREEN ONLY [ 2 ]   PRINT  [ 3 ] FULL       [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 3
```

TDS 19

AMSU A1_29 A1.EXE DIGITAL A DATA 3-MAR-00 03:21:59 PAGE 1

FULL SCAN MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	572	SCENE DATA BP 17 CH 8	15793
2	SYNC SEQUENCE BYTE 2	11111111	574	CH 9	16026
3	SYNC SEQUENCE BYTE 3	11111111	576	CH 10	17209
4	UNIT ID AND SERIAL NO	00011101	578	CH 11	19155
5	DIGITAL B DATA BYTE 1	00000010	580	CH 12	19444
6	DIGITAL B DATA BYTE 2	00001110	582	CH 13	18220
7	DIGITAL B DATA BYTE 3	00000000	584	CH 14	19379
8	DIGITAL B DATA BYTE 4	00000000	586	CH 15	16719
10	REFLECTOR 1 POSITION 1	136	588	REFLECTOR 1 POSITION 18	2712
12	REFLECTOR 2 POSITION 1	16284	590	REFLECTOR 2 POSITION 18	2470
14	REFL 1 POS 1 2ND LOOK	135	592	REFL 1 POS 18 2ND LOOK	2716
16	REFL 2 POS 1 2ND LOOK	16284	594	REFL 2 POS 18 2ND LOOK	2475
18	SCENE DATA BP 1 CH 3	16010	596	SCENE DATA BP 18 CH 3	16034
20	CH 4	17008	598	CH 4	17016
22	CH 5	15401	600	CH 5	15407
24	CH 6	16454	602	CH 6	16464
26	CH 7	16513	604	CH 7	16526
28	CH 8	15775	606	CH 8	15768
30	CH 9	16014	608	CH 9	16027
32	CH 10	17193	610	CH 10	17206
34	CH 11	19148	612	CH 11	19181
36	CH 12	19432	614	CH 12	19445
38	CH 13	18200	616	CH 13	18221
40	CH 14	19364	618	CH 14	19385
42	CH 15	16707	620	CH 15	16715
44	REFLECTOR 1 POSITION 2	285	622	REFLECTOR 1 POSITION 19	2862
46	REFLECTOR 2 POSITION 2	43	624	REFLECTOR 2 POSITION 19	2624
48	REFL 1 POS 2 2ND LOOK	289	626	REFL 1 POS 19 2ND LOOK	2868
50	REFL 2 POS 2 2ND LOOK	48	628	REFL 2 POS 19 2ND LOOK	2627
52	SCENE DATA BP 2 CH 3	16029	630	SCENE DATA BP 19 CH 3	16017
54	CH 4	17016	632	CH 4	17002
56	CH 5	15405	634	CH 5	15401
58	CH 6	16454	636	CH 6	16457
60	CH 7	16513	638	CH 7	16513
62	CH 8	15783	640	CH 8	15771
64	CH 9	16014	642	CH 9	16016
66	CH 10	17194	644	CH 10	17196
68	CH 11	19158	646	CH 11	19158
70	CH 12	19431	648	CH 12	19431
72	CH 13	18195	650	CH 13	18207
74	CH 14	19368	652	CH 14	19355
76	CH 15	16709	654	CH 15	16709
78	REFLECTOR 1 POSITION 3	436	656	REFLECTOR 1 POSITION 20	3014
80	REFLECTOR 2 POSITION 3	194	658	REFLECTOR 2 POSITION 20	2772
82	REFL 1 POS 3 2ND LOOK	440	660	REFL 1 POS 20 2ND LOOK	3019
84	REFL 2 POS 3 2ND LOOK	199	662	REFL 2 POS 20 2ND LOOK	2778
86	SCENE DATA BP 3 CH 3	16021	664	SCENE DATA BP 20 CH 3	16014
88	CH 4	17004	666	CH 4	17001
90	CH 5	15396	668	CH 5	15393
92	CH 6	16458	670	CH 6	16455

FULL SCAN MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	CH 7	16515	672	CH 7	16511
96	CH 8	15781	674	CH 8	15781
98	CH 9	16021	676	CH 9	16014
100	CH 10	17202	678	CH 10	17198
102	CH 11	19163	680	CH 11	19155
104	CH 12	19436	682	CH 12	19438
106	CH 13	18190	684	CH 13	18184
108	CH 14	19354	686	CH 14	19356
110	CH 15	16710	688	CH 15	16709
112	REFLECTOR 1 POSITION 4	585	690	REFLECTOR 1 POSITION 21	3166
114	REFLECTOR 2 POSITION 4	350	692	REFLECTOR 2 POSITION 21	2926
116	REFL 1 POS 4 2ND LOOK	592	694	REFL 1 POS 21 2ND LOOK	3171
118	REFL 2 POS 4 2ND LOOK	352	696	REFL 2 POS 21 2ND LOOK	2930
120	SCENE DATA BP 4 CH 3	16017	698	SCENE DATA BP 21 CH 3	16016
122	CH 4	17000	700	CH 4	16998
124	CH 5	15396	702	CH 5	15397
126	CH 6	16467	704	CH 6	16459
128	CH 7	16514	706	CH 7	16511
130	CH 8	15778	708	CH 8	15778
132	CH 9	16025	710	CH 9	16016
134	CH 10	17214	712	CH 10	17193
136	CH 11	19184	714	CH 11	19154
138	CH 12	19437	716	CH 12	19426
140	CH 13	18218	718	CH 13	18194
142	CH 14	19371	720	CH 14	19388
144	CH 15	16714	722	CH 15	16709
146	REFLECTOR 1 POSITION 5	741	724	REFLECTOR 1 POSITION 22	3313
148	REFLECTOR 2 POSITION 5	499	726	REFLECTOR 2 POSITION 22	3076
150	REFL 1 POS 5 2ND LOOK	744	728	REFL 1 POS 22 2ND LOOK	3320
152	REFL 2 POS 5 2ND LOOK	504	730	REFL 2 POS 22 2ND LOOK	3080
154	SCENE DATA BP 5 CH 3	16023	732	SCENE DATA BP 22 CH 3	16022
156	CH 4	17006	734	CH 4	17002
158	CH 5	15396	736	CH 5	15398
160	CH 6	16466	738	CH 6	16453
162	CH 7	16523	740	CH 7	16513
164	CH 8	15780	742	CH 8	15774
166	CH 9	16025	744	CH 9	16011
168	CH 10	17205	746	CH 10	17191
170	CH 11	19188	748	CH 11	19158
172	CH 12	19464	750	CH 12	19433
174	CH 13	18218	752	CH 13	18198
176	CH 14	19390	754	CH 14	19338
178	CH 15	16715	756	CH 15	16707
180	REFLECTOR 1 POSITION 6	893	758	REFLECTOR 1 POSITION 23	3469
182	REFLECTOR 2 POSITION 6	651	760	REFLECTOR 2 POSITION 23	3229
184	REFL 1 POS 6 2ND LOOK	898	762	REFL 1 POS 23 2ND LOOK	3473
186	REFL 2 POS 6 2ND LOOK	656	764	REFL 2 POS 23 2ND LOOK	3234
188	SCENE DATA BP 6 CH 3	16022	766	SCENE DATA BP 23 CH 3	16018
190	CH 4	16999	768	CH 4	17002
192	CH 5	15397	770	CH 5	15397

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FULL SCAN MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
194	CH 6	16478	772	CH 6	16453
196	CH 7	16537	774	CH 7	16513
198	CH 8	15779	776	CH 8	15775
200	CH 9	16033	778	CH 9	16011
202	CH 10	17209	780	CH 10	17196
204	CH 11	19189	782	CH 11	19158
206	CH 12	19452	784	CH 12	19436
208	CH 13	18207	786	CH 13	18212
210	CH 14	19379	788	CH 14	19362
212	CH 15	16724	790	CH 15	16709
214	REFLECTOR 1 POSITION 7	1041	792	REFLECTOR 1 POSITION 24	3623
216	REFLECTOR 2 POSITION 7	802	794	REFLECTOR 2 POSITION 24	3379
218	REFL 1 POS 7 2ND LOOK	1047	796	REFL 1 POS 24 2ND LOOK	3627
220	REFL 2 POS 7 2ND LOOK	806	798	REFL 2 POS 24 2ND LOOK	3384
222	SCENE DATA BP 7 CH 3	16019	800	SCENE DATA BP 24 CH 3	16013
224	CH 4	17002	802	CH 4	16998
226	CH 5	15399	804	CH 5	15397
228	CH 6	16460	806	CH 6	16455
230	CH 7	16515	808	CH 7	16513
232	CH 8	15775	810	CH 8	15774
234	CH 9	16015	812	CH 9	16013
236	CH 10	17194	814	CH 10	17191
238	CH 11	19165	816	CH 11	19146
240	CH 12	19442	818	CH 12	19434
242	CH 13	18191	820	CH 13	18198
244	CH 14	19365	822	CH 14	19350
246	CH 15	16708	824	CH 15	16708
248	REFLECTOR 1 POSITION 8	1194	826	REFLECTOR 1 POSITION 25	3772
250	REFLECTOR 2 POSITION 8	952	828	REFLECTOR 2 POSITION 25	3530
252	REFL 1 POS 8 2ND LOOK	1198	830	REFL 1 POS 25 2ND LOOK	3777
254	REFL 2 POS 8 2ND LOOK	958	832	REFL 2 POS 25 2ND LOOK	3536
256	SCENE DATA BP 8 CH 3	16030	834	SCENE DATA BP 25 CH 3	16020
258	CH 4	17003	836	CH 4	17002
260	CH 5	15398	838	CH 5	15395
262	CH 6	16455	840	CH 6	16451
264	CH 7	16512	842	CH 7	16512
266	CH 8	15780	844	CH 8	15775
268	CH 9	16018	846	CH 9	16012
270	CH 10	17193	848	CH 10	17197
272	CH 11	19151	850	CH 11	19148
274	CH 12	19424	852	CH 12	19436
276	CH 13	18197	854	CH 13	18197
278	CH 14	19358	856	CH 14	19362
280	CH 15	16709	858	CH 15	16706
282	REFLECTOR 1 POSITION 9	1347	860	REFLECTOR 1 POSITION 26	3925
284	REFLECTOR 2 POSITION 9	1106	862	REFLECTOR 2 POSITION 26	3682
286	REFL 1 POS 9 2ND LOOK	1351	864	REFL 1 POS 26 2ND LOOK	3929
288	REFL 2 POS 9 2ND LOOK	1111	866	REFL 2 POS 26 2ND LOOK	3689
290	SCENE DATA BP 9 CH 3	16020	868	SCENE DATA BP 26 CH 3	16025
292	CH 4	17007	870	CH 4	17001

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
294	CH 5	15399	872	CH 5	15400
296	CH 6	16454	874	CH 6	16455
298	CH 7	16519	876	CH 7	16515
300	CH 8	15775	878	CH 8	15781
302	CH 9	16009	880	CH 9	16014
304	CH 10	17195	882	CH 10	17185
306	CH 11	19163	884	CH 11	19151
308	CH 12	19432	886	CH 12	19429
310	CH 13	18185	888	CH 13	18186
312	CH 14	19360	890	CH 14	19356
314	CH 15	16706	892	CH 15	16709
316	REFLECTOR 1 POSITION 10	1496	894	REFLECTOR 1 POSITION 27	4077
318	REFLECTOR 2 POSITION 10	1257	896	REFLECTOR 2 POSITION 27	3833
320	REFL 1 POS 10 2ND LOOK	1502	898	REFL 1 POS 27 2ND LOOK	4081
322	REFL 2 POS 10 2ND LOOK	1261	900	REFL 2 POS 27 2ND LOOK	3840
324	SCENE DATA BP 10 CH 3	16018	902	SCENE DATA BP 27 CH 3	16041
326	CH 4	17000	904	CH 4	17011
328	CH 5	15399	906	CH 5	15397
330	CH 6	16453	908	CH 6	16452
332	CH 7	16515	910	CH 7	16512
334	CH 8	15777	912	CH 8	15791
336	CH 9	16011	914	CH 9	16015
338	CH 10	17194	916	CH 10	17195
340	CH 11	19154	918	CH 11	19149
342	CH 12	19424	920	CH 12	19438
344	CH 13	18200	922	CH 13	18195
346	CH 14	19373	924	CH 14	19373
348	CH 15	16709	926	CH 15	16708
350	REFLECTOR 1 POSITION 11	1650	928	REFLECTOR 1 POSITION 28	4223
352	REFLECTOR 2 POSITION 11	1410	930	REFLECTOR 2 POSITION 28	3989
354	REFL 1 POS 11 2ND LOOK	1654	932	REFL 1 POS 28 2ND LOOK	4232
356	REFL 2 POS 11 2ND LOOK	1413	934	REFL 2 POS 28 2ND LOOK	3992
358	SCENE DATA BP 11 CH 3	16036	936	SCENE DATA BP 28 CH 3	16034
360	CH 4	17003	938	CH 4	17022
362	CH 5	15404	940	CH 5	15408
364	CH 6	16453	942	CH 6	16453
366	CH 7	16512	944	CH 7	16514
368	CH 8	15769	946	CH 8	15791
370	CH 9	16015	948	CH 9	16015
372	CH 10	17194	950	CH 10	17192
374	CH 11	19152	952	CH 11	19150
376	CH 12	19429	954	CH 12	19432
378	CH 13	18200	956	CH 13	18205
380	CH 14	19385	958	CH 14	19344
382	CH 15	16706	960	CH 15	16707
384	REFLECTOR 1 POSITION 12	1802	962	REFLECTOR 1 POSITION 29	4380
386	REFLECTOR 2 POSITION 12	1561	964	REFLECTOR 2 POSITION 29	4140
388	REFL 1 POS 12 2ND LOOK	1806	966	REFL 1 POS 29 2ND LOOK	4384
390	REFL 2 POS 12 2ND LOOK	1566	968	REFL 2 POS 29 2ND LOOK	4144
392	SCENE DATA BP 12 CH 3	16014	970	SCENE DATA BP 29 CH 3	16061

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
394	CH 4	16999	972	CH 4	17061
396	CH 5	15397	974	CH 5	15438
398	CH 6	16456	976	CH 6	16455
400	CH 7	16514	978	CH 7	16508
402	CH 8	15779	980	CH 8	15809
404	CH 9	16014	982	CH 9	16013
406	CH 10	17193	984	CH 10	17193
408	CH 11	19164	986	CH 11	19149
410	CH 12	19431	988	CH 12	19434
412	CH 13	18197	990	CH 13	18199
414	CH 14	19350	992	CH 14	19368
416	CH 15	16709	994	CH 15	16706
418	REFLECTOR 1 POSITION 13	1950	996	REFLECTOR 1 POSITION 30	4533
420	REFLECTOR 2 POSITION 13	1712	998	REFLECTOR 2 POSITION 30	4287
422	REFL 1 POS 13 2ND LOOK	1956	1000	REFL 1 POS 30 2ND LOOK	4535
424	REFL 2 POS 13 2ND LOOK	1716	1002	REFL 2 POS 30 2ND LOOK	4295
426	SCENE DATA BP 13 CH 3	16026	1004	SCENE DATA BP 30 CH 3	16036
428	CH 4	17014	1006	CH 4	17019
430	CH 5	15409	1008	CH 5	15403
432	CH 6	16461	1010	CH 6	16450
434	CH 7	16524	1012	CH 7	16517
436	CH 8	15781	1014	CH 8	15794
438	CH 9	16018	1016	CH 9	16014
440	CH 10	17202	1018	CH 10	17195
442	CH 11	19165	1020	CH 11	19149
444	CH 12	19449	1022	CH 12	19416
446	CH 13	18216	1024	CH 13	18192
448	CH 14	19381	1026	CH 14	19369
450	CH 15	16717	1028	CH 15	16706
452	REFLECTOR 1 POSITION 14	2105	1030	REFLECTOR 1 COLD CAL POS	6129
454	REFLECTOR 2 POSITION 14	1863	1032	REFLECTOR 2 COLD CAL POS	5893
456	REFL 1 POS 14 2ND LOOK	2108	1034	REFL 1 COLD CAL 2ND LOOK	6130
458	REFL 2 POS 14 2ND LOOK	1868	1036	REFL 2 COLD CAL 2ND LOOK	5893
460	SCENE DATA BP 14 CH 3	16022	1038	COLD CAL DATA 1 CH 3	16055
462	CH 4	17015	1040	CH 4	17013
464	CH 5	15409	1042	CH 5	15402
466	CH 6	16471	1044	CH 6	16453
468	CH 7	16517	1046	CH 7	16510
470	CH 8	15801	1048	CH 8	15795
472	CH 9	16029	1050	CH 9	16014
474	CH 10	17212	1052	CH 10	17193
476	CH 11	19160	1054	CH 11	19161
478	CH 12	19458	1056	CH 12	19424
480	CH 13	18220	1058	CH 13	18197
482	CH 14	19407	1060	CH 14	19389
484	CH 15	16719	1062	CH 15	16707
486	REFLECTOR 1 POSITION 15	2256	1064	COLD CAL DATA 2 CH 3	16049
488	REFLECTOR 2 POSITION 15	2016	1066	CH 4	17014
490	REFL 1 POS 15 2ND LOOK	2262	1068	CH 5	15403
492	REFL 2 POS 15 2ND LOOK	2020	1070	CH 6	16454

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
494	SCENE DATA BP 15 CH 3	16018	1072	CH 7	16508
496	CH 4	17017	1074	CH 8	15794
498	CH 5	15419	1076	CH 9	16017
500	CH 6	16466	1078	CH 10	17197
502	CH 7	16519	1080	CH 11	19151
504	CH 8	15803	1082	CH 12	19428
506	CH 9	16034	1084	CH 13	18204
508	CH 10	17212	1086	CH 14	19365
510	CH 11	19195	1088	CH 15	16709
512	CH 12	19445	1182	REFLECTOR 1 WARM CAL POS	10528
514	CH 13	18192	1184	REFLECTOR 2 WARM CAL POS	10289
516	CH 14	19370	1186	REFL 1 WARM CAL 2ND LOOK	10528
518	CH 15	16713	1188	REFL 2 WARM CAL 2ND LOOK	10289
520	REFLECTOR 1 POSITION 16	2406	1190	WARM CAL DATA 1 CH 3	16026
522	REFLECTOR 2 POSITION 16	2168	1192	CH 4	17009
524	REFL 1 POS 16 2ND LOOK	2411	1194	CH 5	15405
526	REFL 2 POS 16 2ND LOOK	2171	1196	CH 6	16449
528	SCENE DATA BP 16 CH 3	16015	1198	CH 7	16513
530	CH 4	17013	1200	CH 8	15783
532	CH 5	15415	1202	CH 9	16011
534	CH 6	16478	1204	CH 10	17194
536	CH 7	16525	1206	CH 11	19149
538	CH 8	15784	1208	CH 12	19422
540	CH 9	16036	1210	CH 13	18190
542	CH 10	17238	1212	CH 14	19358
544	CH 11	19201	1214	CH 15	16707
546	CH 12	19446	1216	WARM CAL DATA 2 CH 3	16029
548	CH 13	18216	1218	CH 4	17013
550	CH 14	19374	1220	CH 5	15405
552	CH 15	16723	1222	CH 6	16449
554	REFLECTOR 1 POSITION 17	2558	1224	CH 7	16513
556	REFLECTOR 2 POSITION 17	2317	1226	CH 8	15778
558	REFL 1 POS 17 2ND LOOK	2563	1228	CH 9	16013
560	REFL 2 POS 17 2ND LOOK	2324	1230	CH 10	17194
562	SCENE DATA BP 17 CH 3	16035	1232	CH 11	19155
564	CH 4	17016	1234	CH 12	19436
566	CH 5	15407	1236	CH 13	18194
568	CH 6	16472	1238	CH 14	19383
570	CH 7	16526	1240	CH 15	16707

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
1090	SCAN MOTOR A1-1	18559	24.30
1092	SCAN MOTOR A1-2	19283	25.83
1094	FEEDHORN A1-1	19579	25.92
1096	FEEDHORN A1-2	20500	27.74
1098	RF MUX A1-1	20060	27.74
1100	RF MUX A1-2	21256	29.63
1102	LOCAL OSCILLATOR CHANNEL 3	21851	31.12
1104	LOCAL OSCILLATOR CHANNEL 4	22656	31.77
1106	LOCAL OSCILLATOR CHANNEL 5	21757	30.94
1108	LOCAL OSCILLATOR CHANNEL 6	20766	28.47
1110	LOCAL OSCILLATOR CHANNEL 7	20899	28.68
1112	LOCAL OSCILLATOR CHANNEL 8	22018	31.00
1114	LOCAL OSCILLATOR CHANNEL 15	21560	30.43
1116	PLL LO #2 CHANNELS 9 THROUGH 14	20043	27.33
1118	PLL LO #1 CHANNELS 9 THROUGH 14	22867	32.87
1120	SPARE (NOT USED)	32767	52.55
1122	MIXER/IF AMPLIFIER CHANNEL 3	21294	30.00
1124	MIXER/IF AMPLIFIER CHANNEL 4	21510	30.10
1126	MIXER/IF AMPLIFIER CHANNEL 5	21157	29.96
1128	MIXER/IF AMPLIFIER CHANNEL 6	20590	28.27
1130	MIXER/IF AMPLIFIER CHANNEL 7	20707	28.59
1132	MIXER/IF AMPLIFIER CHANNEL 8	21487	30.16
1134	MIXER/IF AMPLIFIER CH 9 THRU 14	20244	27.70
1136	MIXER/IF AMPLIFIER CHANNEL 15	21223	29.82
1138	IF AMPLIFIER CHANNEL 11 THRU 14	21205	29.60
1140	IF AMPLIFIER CHANNEL 9	21487	29.72
1142	IF AMPLIFIER CHANNEL 10	21310	29.78
1144	IF AMPLIFIER CHANNEL 11	20708	28.03
1146	DC/DC CONVERTER	22529	31.77
1148	IF AMPLIFIER CHANNEL 13	20425	28.07
1150	IF AMPLIFIER CHANNEL 14	20586	28.04
1152	IF AMPLIFIER CHANNEL 12	20033	28.11
1154	RF SHELF A1-1	20797	28.42
1156	RF SHELF A1-2	21416	29.59
1158	DETECTOR/PREAMPLIFIER ASSEMBLY	19672	26.35
1160	A1-1 WARM LOAD 1	23672	24.54
1162	A1-1 WARM LOAD 2	23708	24.55
1164	A1-1 WARM LOAD 3	23763	24.59
1166	A1-1 WARM LOAD 4	23633	24.64
1168	A1-1 WARM LOAD CENTER	24050	24.55
1170	A1-2 WARM LOAD 1	24670	26.63
1172	A1-2 WARM LOAD 2	24803	26.56
1174	A1-2 WARM LOAD 3	24693	26.61
1176	A1-2 WARM LOAD 4	24532	26.61
1178	A1-2 WARM LOAD CENTER	24961	26.61
1180	TEMP SENSOR REFERENCE VOLTAGE	25044	

FULL SCAN MODE

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER A1-1 POWER	ON	ON	ON
SCANNER A1-2 POWER	ON	ON	ON
PLL POWER	PLLO # 1	PLLO # 1	PLLO # 1
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	YES	YES	YES
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	215	19.4	215	19.4	215	19.4
A1-2 SCANNER MOTOR TEMPERATURE	217	22.1	217	22.1	217	22.1
A1-1 RF SHELF TEMPERATURE	215	19.4	215	19.4	215	19.4
A1-2 RF SHELF TEMPERATURE	220	26.2	220	26.2	220	26.2
A1-1 WARM LOAD TEMPERATURE	215	19.4	215	19.4	215	19.4
A1-2 WARM LOAD TEMPERATURE	217	22.1	217	22.1	217	22.1

DESCRIPTION	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG)	99	46.13	99	46.13	99	46.13
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG)	86	40.08	87	40.54	87	40.54
SIGNAL PROCESSING +15 VDC	170	14.67	170	14.67	170	14.67
ANTENNA DRIVE +15 VDC	169	14.58	169	14.58	170	14.67
SIGNAL PROCESSING -15 VDC	149	-15.10	149	-15.10	149	-15.10
ANTENNA DRIVE -15 VDC	147	-15.20	147	-15.20	148	-15.15
RECEIVER AMPLIFIER +8 VDC	156	7.80	156	7.80	156	7.80
SIGNAL PROCESSOR +5 VDC	145	4.83	145	4.83	145	4.83
ANTENNA DRIVE +5 VDC	145	4.83	145	4.83	145	4.83
RECEIVER MIXER/IF +10 VDC	168	9.71	168	9.71	168	9.71
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC	168	14.50	168	14.50	168	14.50
PHASE LOCK LOOP (CHANNEL 9/14) -15 VDC	143	-15.40	143	-15.40	143	-15.40
L.O. VOLTAGE (CHANNEL 8) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 7) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 6) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 3) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 4) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 5) VDC	171	9.78	171	9.78	171	9.78
PLLO # 2 LOCK DETECT	2	0.04	2	0.04	2	0.04
PLLO # 1 LOCK DETECT	217	4.34	217	4.34	217	4.34
L.O. VOLTAGE (CHANNEL 15) VDC	170	14.67	170	14.67	170	14.67

AMSU A1_29 A1.EXE AZONIX DATA 3-MAR-00 03:21:59 PAGE 9

FULL SCAN MODE

PRT TEMPERATURES

	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
VARIABLE TARGET	615	42.00	601	14.00
	616	43.00	602	15.00
	617	44.00	603	16.00
	618	45.00	604	17.00
	619	46.00	605	18.00
	620	47.00	606	19.00
	621	48.00	607	20.00
FIXED TARGET	622	49.00	608	21.00
	623	50.00	609	22.00
	624	51.00	610	23.00
	625	52.00	611	24.00
	626	53.00	612	25.00
	627	67.00	613	69.00
	628	68.00	614	70.00
BASEPLATE	629	71.00	630	72.00
	631	26.00	632	27.00

THERMOCOUPLE TEMPERATURES

	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
FIXED TARGET SHROUD	558	5.00	537	34.00
	559	6.00	538	35.00
VARIABLE TARGET SHROUD	550	7.00	524	36.00
	551	8.00	525	37.00
FIXED TARGET N2	506	57.00	502	30.00
	507	58.00	503	31.00
VARIABLE TARGET N2	516	59.00	511	32.00
	517	60.00	512	33.00
HEATER N2	514	1.00	509	38.00
	515	2.00	510	39.00
FIXED TARGET FLOW METER	508	63.00	504	61.00
VARIABLE TARGET FLOW METER	518	64.00	513	62.00
BASEPLATE HEATER N2	519	3.00	520	4.00
BASEPLATE N2	521	9.00	522	10.00
BASEPLATE FLOW METER	523	65.00		
ADJUNCT RADIATORS	575	73.00	577	74.00
	579	75.00	581	76.00

TEST DATA SHEET 20

Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Measured*	Required**	Pass/Fail PASS	Element (For Ref)	Measured*	Required**	Pass/Fail PASS
01	0014	135	138		0016	16282	16280	
02	0048	289	290		0050	48	48	
03	0082	440	442		0084	199	200	
04	0116	592	593		0118	353	351	
05	0150	744	745		0152	504	503	
06	0184	999	897		0186	655	655	
07	0218	1047	1048		0220	806	806	
08	0252	1198	1200		0254	958	958	
09	0286	1352	1352		0288	1111	1110	
10	0320	1503	1503		0322	1262	1261	
11	0354	1654	1655		0356	1413	1413	
12	0388	1806	1807		0390	1566	1565	
13	0422	1955	1958		0424	1716	1716	
14	0456	2109	2110		0458	1867	1868	
15	0490	2262	2262		0492	2019	2020	
16	0524	2411	2413		0526	2171	2171	
17	0558	2565	2565		0560	2323	2323	
18	0592	2716	2717		0594	2476	2475	
19	0626	2868	2868		0628	2626	2626	
20	0660	3019	3020		0662	2779	2778	
21	0694	3171	3172		0696	2931	2930	
22	0728	3321	3323		0730	3081	3081	
23	0762	3474	3475		0764	3234	3233	
24	0796	3627	3627		0798	3385	3385	
25	0830	3777	3778		0832	3536	3536	
26	0864	3930	3930		0866	3688	3688	
27	0890	4081	4082		0900	3840	3840	
28	0932	4232	4233		0934	3993	3991	
29	0966	4384	4385		0968	4143	4143	
30	1000	4536	4537		1002	4295	4295	
CC	1034	6129	6131		1036	5891	5889	
WC	1186	10528	1053		1188	10290	10288	

* 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: 873237 S/N: R4/108 108

R. Haigl 3/3/00

Test Systems Engineer Date

3-4-00

Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00

Quality Control Date

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:15:36 SCAN NUMBER 97

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	135	135	9	1348	1352	17	2560	2565	25	3771	3777
2	284	289	10	1496	1503	18	2713	2716	26	3926	3930
3	436	440	11	1651	1654	19	2861	2868	27	4077	4081
4	585	592	12	1802	1806	20	3015	3019	28	4224	4232
5	740	744	13	1950	1955	21	3166	3171	29	4379	4384
6	894	899	14	2104	2109	22	3315	3321	30	4532	4536
7	1042	1047	15	2256	2262	23	3470	3474	CC	6129	6129
8	1193	1198	16	2406	2411	24	3624	3627	WC	10528	10528

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 20

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:15:48 SCAN NUMBER 98

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	16282	16282	9	1106	1111	17	2317	2323	25	3532	3536
2	42	48	10	1258	1262	18	2471	2476	26	3682	3688
3	195	199	11	1410	1413	19	2622	2626	27	3836	3840
4	350	353	12	1559	1566	20	2773	2779	28	3990	3993
5	499	504	13	1713	1716	21	2926	2931	29	4140	4143
6	650	655	14	1862	1867	22	3074	3081	30	4289	4295
7	801	806	15	2015	2019	23	3229	3234	CC	5891	5891
8	951	958	16	2166	2171	24	3380	3385	WC	10290	10290

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 20

TEST DATA SHEET 21

Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Position*	Required**	Pass/Fail PASS	Element (For Ref)	Position*	Required**	Pass/Fail PASS
01	0018	16033	16,500±4000		0030	16040	16,500±4000	
02	0052	16053			0064	16042		
03	0086	16045			0098	16048		
04	0120	16042			0132	16048		
05	0154	16042			0166	16049		
06	0188	16047			0200	16064		
07	0222	16032			0234	16043		
08	0256	16047			0268	16044		
09	0290	16042			0302	16043		
10	0324	16040			0336	16041		
11	0356	16050			0370	16039		
12	0392	16043			0404	16042		
13	0426	16053			0438	16045		
14	0460	16042			0472	16054		
15	0494	16037			0506	16056		
16	0528	16038			0540	16062		
17	0562	16055			0574	16050		
18	0596	16055			0608	16056		
19	0630	16040			0642	16042		
20	0664	16039			0676	16041		
21	0698	16037			0710	16042		
22	0732	16043			0744	16043		
23	0766	16042			0778	16040		
24	0800	16038			0812	16038		
25	0834	16045			0846	16040		
26	0868	16047			0880	16044		
27	0902	16068			0914	16042		
28	0936	16055			0948	16039		
29	0970	16084			0982	16043		
30	1004	16054			1016	16040		
CC	1038	16067			1050	16040		
WC	1190	16049	16,500±4000	PASS	1202	16042	16,500±4000	PASS

* 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: 373237 S/N: 109

R. Haigh 3/3/00

Test Systems Engineer Date

3-4-00

Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00

Quality Control Date

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:16:17 SCAN NUMBER 102

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 3

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16033	9	16042	17	16055	25	16045
2	16053	10	16040	18	16055	26	16047
3	16045	11	16050	19	16040	27	16068
4	16042	12	16043	20	16039	28	16055
5	16042	13	16053	21	16037	29	16084
6	16047	14	16042	22	16043	30	16054
7	16032	15	16037	23	16042	CC	16067
8	16047	16	16038	24	16038	WC	16049

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TD321

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:16:31 SCAN NUMBER 104

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 9

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16040	9	16043	17	16050	25	16040
2	16042	10	16041	18	16056	26	16044
3	16048	11	16039	19	16042	27	16042
4	16048	12	16042	20	16041	28	16039
5	16049	13	16045	21	16042	29	16043
6	16064	14	16054	22	16043	30	16040
7	16043	15	16056	23	16040	CC	16040
8	16044	16	16062	24	16038	WC	16042

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

+0521

TEST DATA SHEET 22 (Sheet 1 of 2)
Full Scan Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.1)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1	24.56	25 ± 15	PASS
1092	A1-1 Warm Load 2	24.55	25 ± 15	
1094	A1-1 Warm Load 3	24.60	25 ± 15	
1096	A1-1 Warm Load 4	24.64	25 ± 15	
1098	A1-1 Warm Load Center	24.55	25 ± 15	
1100	A1-2 Warm Load 1	26.65	25 ± 15	
1102	A1-2 Warm Load 2	26.59	25 ± 15	
1104	A1-2 Warm Load 3	26.65	25 ± 15	
1106	A1-2 Warm Load 4	26.65	25 ± 15	
1108	A1-2 Warm Load Center	26.64	25 ± 15	
1110	Local Oscillator Channel 7	28.35	25 ± 15	
1112	Local Oscillator Channel 8	30.56	25 ± 15	
1114	Local Oscillator Channel 15	29.88	25 ± 15	
1116	PLL LO #2 Channels 9-14	27.09	25 ± 15	
1118	PLL LO #1 Channels 9-14	31.89	25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***	N/A AMSU 5 SEIT	25 ± 15	
1122	Mixer I.F. Amp. Channel 3	29.60	25 ± 15	
1124	Mixer I.F. Amp. Channel 4	29.67	25 ± 15	
1126	Mixer I.F. Amp. Channel 5	29.53	25 ± 15	
1128	Mixer I.F. Amp. Channel 6	27.95	25 ± 15	
1130	Mixer I.F. Amp. Channel 7	28.22	25 ± 15	
1132	Mixer I.F. Amp. Channel 8	29.72	25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14	27.40	25 ± 15	
1136	Mixer I.F. Amp. Channel 15	29.42	25 ± 15	PASS

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14	29.04	25 ± 15	PASS
1140	I.F. Amp. Channel 9	29.16	25 ± 15	
1142	I.F. Amp. Channel 10	29.21	25 ± 15	
1144	I.F. Amp. Channel 11	27.77	25 ± 15	
1146	DC/DC Converter	30.94	25 ± 15	
1148	I.F. Amp. Channel 13	27.81	25 ± 15	
1150	I.F. Amp. Channel 14	27.78	25 ± 15	
1152	I.F. Amp. Channel 12	27.85	25 ± 15	
1154	RF Shelf A1-1	27.99	25 ± 15	
1156	RF Shelf A1-2	29.18	25 ± 15	
1158	Detector Preamp Assy.	26.14	25 ± 15	
1160	Scan Motor A1-1	24.24	25 ± 15	
1162	Scan Motor A1-2	25.79	25 ± 15	
1164	Feed Horn A1-1	25.76	25 ± 15	
1166	Feed Horn A1-2	27.47	25 ± 15	
1168	R.F. Mux A1-1	27.40	25 ± 15	
1170	R.F. Mux A1-2	29.21	25 ± 15	
1172	Local Oscillator Channel 3	30.61	25 ± 15	
1174	Local Oscillator Channel 4	31.27	25 ± 15	
1176	Local Oscillator Channel 5	30.52	25 ± 15	
1178	Local Oscillator Channel 6	28.23	25 ± 15	
1180	Temp Sensor Ref Voltage Count	25044	**	PASS

* 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: 373237 S/N: 109

R. Hail 3/3/00
Test Systems Engineer Date

Customer Representative (Flight Hardware Only) 3-4-00 Date

Quality Control 7A 194 3-3-00 Date

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:16:49 SCAN NUMBER 106

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 1 TO 16

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR A1-1	18528	24.24	9	LO CHANNEL 5	21541	30.52
2	SCAN MOTOR A1-2	19261	25.79	10	LO CHANNEL 6	20640	28.23
3	FEEDHORN A1-1	19492	25.76	11	LO CHANNEL 7	20726	28.35
4	FEEDHORN A1-2	20357	27.47	12	LO CHANNEL 8	21791	30.56
5	RF MUX A1-1	19883	27.40	13	LO CHANNEL 15	21274	29.88
6	RF MUX A1-2	21038	29.21	14	PLLO #2 CH 9/14	19919	27.09
7	LO CHANNEL 3	21604	30.61	15	PLLO #1 CH 9/14	22358	31.89
8	LO CHANNEL 4	22399	31.27	16	PLLO REFERENCE	32767	52.55

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS22

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:17:03 SCAN NUMBER 108

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 17 TO 32

NO		DATA	TEMP C	NO		DATA	TEMP C
17	MIXER IF CH 3	21091	29.60	25	IF AMP CH 11/14	20918	29.04
18	MIXER IF CH 4	21289	29.67	26	IF AMP CH 9	21198	29.16
19	MIXER IF CH 5	20933	29.53	27	IF AMP CH 10	21019	29.21
20	MIXER IF CH 6	20426	27.95	28	IF AMP CH 11	20572	27.77
21	MIXER IF CH 7	20516	28.22	29	DC/DC CONVERTER	22099	30.94
22	MIXER IF CH 8	21259	29.72	30	IF AMP CH 13	20288	27.81
23	MIXER IF CH 9/14	20091	27.40	31	IF AMP CH 14	20449	27.78
24	MIXER IF CH 15	20998	29.42	32	IF AMP CH 12	19896	27.85

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS22

AMSU A1-29 A1.EXE FULL SCAN MODE P1 3-MAR-00 03:17:11 SCAN NUMBER 109

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 31 TO 46

NO	DATA	TEMP C	NO	DATA	TEMP C
31 IF AMP CH 14	20452	27.78	39 A1-1 WARM LOAD 4	23633	24.64
32 IF AMP CH 12	19899	27.86	40 A1-1 WARM LOAD C	24053	24.55
33 RF SHELF A1-1	20572	27.99	41 A1-2 WARM LOAD 1	24683	26.65
34 RF SHELF A1-2	21205	29.18	42 A1-2 WARM LOAD 2	24817	26.59
35 DETECTOR/PREAMP	19562	26.14	43 A1-2 WARM LOAD 3	24709	26.65
36 A1-1 WARM LOAD 1	23680	24.56	44 A1-2 WARM LOAD 4	24550	26.65
37 A1-1 WARM LOAD 2	23710	24.55	45 A1-2 WARM LOAD C	24975	26.64
38 A1-1 WARM LOAD 3	23767	24.60	THERMAL REFERENCE	25044	

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 22

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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	P
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	29	*	
[III]	0005	Digital-B Data Byte 1	4	4	
	0006	Digital-B Data Byte 2	14	14	
	0007	Digital-B Data Byte 3	0	0	
	0008	Digital-B Data Byte 4	0	0	

* AMSU A1 Identification Words (data entered in decimal system)	Binary	Decimal
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: 373237 S/N: 108

R. Haist 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

QA 194 3-3-00
Quality Control Date

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AMSU  A1-29 A1.EXE    WARM CAL MODE      P1  3-MAR-00 03:27:42  SCAN NUMBER   187
[ 5 ] DIGITAL A DATA  ELEMENT 0000
[ 6 ] DIGITAL B DATA  ELEMENT   00
[ 7 ] ANALOG DATA     ELEMENT   00

                                      COMMANDS
[ 9 ]  MODULE POWER =        CONNECT       ANTENNA IN COLD CAL POSIT = NO  [ 15 ]
[ 10 ] SURVIVAL HEATER POWER =      OFF    ANTENNA IN NADIR POSITION = NO  [ 16 ]
[ 11 ] MODULE TOTALLY OFF =         ON     ANTENNA IN FULL SCAN MODE = NO  [ 17 ]
[ 12 ] SCANNER A1 - 1 POWER =       ON     PLL POWER =           PLLO # 1  [ 18 ]
[ 13 ] SCANNER A1 - 2 POWER =       ON     COLD CAL POSITION MSB =    ZERO [ 19 ]
[ 14 ] ANTENNA IN WARM CAL POSIT = YES     COLD CAL POSITION LSB =    ZERO [ 20 ]
          POWER [ 4 ]  ON
                       SCREEN ONLY [ 2 ]  PRINT  [ 3 ] FULL       [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 3
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TD523

WARM CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	572	WARM CAL SAMPLE 17 CH 8	15757
2	SYNC SEQUENCE BYTE 2	11111111	574	CH 9	15990
3	SYNC SEQUENCE BYTE 3	11111111	576	CH 10	17156
4	UNIT ID AND SERIAL NO	00011101	578	CH 11	19092
5	DIGITAL B DATA BYTE 1	00000100	580	CH 12	19373
6	DIGITAL B DATA BYTE 2	00001110	582	CH 13	18139
7	DIGITAL B DATA BYTE 3	00000000	584	CH 14	19285
8	DIGITAL B DATA BYTE 4	00000000	586	CH 15	16673
10	REFLECTOR 1 POSITION 1	10525	588	REFLECTOR 1 POSITION 18	10525
12	REFLECTOR 2 POSITION 1	10283	590	REFLECTOR 2 POSITION 18	10283
14	REFL 1 POS 1 2ND LOOK	10525	592	REFL 1 POS 18 2ND LOOK	10525
16	REFL 2 POS 1 2ND LOOK	10283	594	REFL 2 POS 18 2ND LOOK	10283
18	WARM CAL SAMPLE 1 CH 3	16011	596	WARM CAL SAMPLE 18 CH 3	16000
20	CH 4	16981	598	CH 4	16981
22	CH 5	15387	600	CH 5	15379
24	CH 6	16434	602	CH 6	16432
26	CH 7	16496	604	CH 7	16495
28	CH 8	15757	606	CH 8	15759
30	CH 9	15987	608	CH 9	15993
32	CH 10	17162	610	CH 10	17163
34	CH 11	19098	612	CH 11	19100
36	CH 12	19359	614	CH 12	19361
38	CH 13	18126	616	CH 13	18128
40	CH 14	19289	618	CH 14	19283
42	CH 15	16673	620	CH 15	16672
44	REFLECTOR 1 POSITION 2	10525	622	REFLECTOR 1 POSITION 19	10525
46	REFLECTOR 2 POSITION 2	10283	624	REFLECTOR 2 POSITION 19	10283
48	REFL 1 POS 2 2ND LOOK	10525	626	REFL 1 POS 19 2ND LOOK	10525
50	REFL 2 POS 2 2ND LOOK	10283	628	REFL 2 POS 19 2ND LOOK	10283
52	WARM CAL SAMPLE 2 CH 3	16003	630	WARM CAL SAMPLE 19 CH 3	16006
54	CH 4	16980	632	CH 4	16982
56	CH 5	15381	634	CH 5	15384
58	CH 6	16438	636	CH 6	16430
60	CH 7	16491	638	CH 7	16496
62	CH 8	15757	640	CH 8	15756
64	CH 9	15990	642	CH 9	15991
66	CH 10	17164	644	CH 10	17161
68	CH 11	19091	646	CH 11	19099
70	CH 12	19363	648	CH 12	19364
72	CH 13	18126	650	CH 13	18128
74	CH 14	19283	652	CH 14	19278
76	CH 15	16674	654	CH 15	16673
78	REFLECTOR 1 POSITION 3	10525	656	REFLECTOR 1 POSITION 20	10525
80	REFLECTOR 2 POSITION 3	10283	658	REFLECTOR 2 POSITION 20	10283
82	REFL 1 POS 3 2ND LOOK	10525	660	REFL 1 POS 20 2ND LOOK	10525
84	REFL 2 POS 3 2ND LOOK	10283	662	REFL 2 POS 20 2ND LOOK	10283
86	WARM CAL SAMPLE 3 CH 3	16003	664	WARM CAL SAMPLE 20 CH 3	16007
88	CH 4	16985	666	CH 4	16980
90	CH 5	15383	668	CH 5	15384
92	CH 6	16431	670	CH 6	16435

WARM CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	CH 7	16494	672	CH 7	16493
96	CH 8	15757	674	CH 8	15755
98	CH 9	15989	676	CH 9	15987
100	CH 10	17159	678	CH 10	17162
102	CH 11	19092	680	CH 11	19092
104	CH 12	19368	682	CH 12	19361
106	CH 13	18139	684	CH 13	18127
108	CH 14	19297	686	CH 14	19291
110	CH 15	16675	688	CH 15	16673
112	REFLECTOR 1 POSITION 4	10525	690	REFLECTOR 1 POSITION 21	10525
114	REFLECTOR 2 POSITION 4	10283	692	REFLECTOR 2 POSITION 21	10283
116	REFL 1 POS 4 2ND LOOK	10525	694	REFL 1 POS 21 2ND LOOK	10525
118	REFL 2 POS 4 2ND LOOK	10283	696	REFL 2 POS 21 2ND LOOK	10283
120	WARM CAL SAMPLE 4 CH 3	16006	698	WARM CAL SAMPLE 21 CH 3	16007
122	CH 4	16982	700	CH 4	16979
124	CH 5	15381	702	CH 5	15381
126	CH 6	16431	704	CH 6	16433
128	CH 7	16501	706	CH 7	16491
130	CH 8	15759	708	CH 8	15758
132	CH 9	15989	710	CH 9	15991
134	CH 10	17160	712	CH 10	17160
136	CH 11	19097	714	CH 11	19095
138	CH 12	19367	716	CH 12	19364
140	CH 13	18133	718	CH 13	18143
142	CH 14	19281	720	CH 14	19316
144	CH 15	16675	722	CH 15	16673
146	REFLECTOR 1 POSITION 5	10525	724	REFLECTOR 1 POSITION 22	10525
148	REFLECTOR 2 POSITION 5	10283	726	REFLECTOR 2 POSITION 22	10283
150	REFL 1 POS 5 2ND LOOK	10525	728	REFL 1 POS 22 2ND LOOK	10525
152	REFL 2 POS 5 2ND LOOK	10283	730	REFL 2 POS 22 2ND LOOK	10283
154	WARM CAL SAMPLE 5 CH 3	16003	732	WARM CAL SAMPLE 22 CH 3	16006
156	CH 4	16982	734	CH 4	16980
158	CH 5	15382	736	CH 5	15384
160	CH 6	16431	738	CH 6	16433
162	CH 7	16496	740	CH 7	16496
164	CH 8	15756	742	CH 8	15757
166	CH 9	15989	744	CH 9	15987
168	CH 10	17160	746	CH 10	17160
170	CH 11	19097	748	CH 11	19093
172	CH 12	19372	750	CH 12	19375
174	CH 13	18139	752	CH 13	18122
176	CH 14	19264	754	CH 14	19289
178	CH 15	16674	756	CH 15	16671
180	REFLECTOR 1 POSITION 6	10525	758	REFLECTOR 1 POSITION 23	10525
182	REFLECTOR 2 POSITION 6	10283	760	REFLECTOR 2 POSITION 23	10283
184	REFL 1 POS 6 2ND LOOK	10525	762	REFL 1 POS 23 2ND LOOK	10525
186	REFL 2 POS 6 2ND LOOK	10283	764	REFL 2 POS 23 2ND LOOK	10283
188	WARM CAL SAMPLE 6 CH 3	16002	766	WARM CAL SAMPLE 23 CH 3	16002
190	CH 4	16982	768	CH 4	16981
192	CH 5	15384	770	CH 5	15382

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
194	CH 6	16431	772	CH 6	16431
196	CH 7	16494	774	CH 7	16497
198	CH 8	15756	776	CH 8	15760
200	CH 9	15993	778	CH 9	15991
202	CH 10	17162	780	CH 10	17160
204	CH 11	19093	782	CH 11	19093
206	CH 12	19367	784	CH 12	19359
208	CH 13	18119	786	CH 13	18122
210	CH 14	19290	788	CH 14	19302
212	CH 15	16673	790	CH 15	16673
214	REFLECTOR 1 POSITION 7	10525	792	REFLECTOR 1 POSITION 24	10525
216	REFLECTOR 2 POSITION 7	10283	794	REFLECTOR 2 POSITION 24	10283
218	REFL 1 POS 7 2ND LOOK	10525	796	REFL 1 POS 24 2ND LOOK	10525
220	REFL 2 POS 7 2ND LOOK	10283	798	REFL 2 POS 24 2ND LOOK	10283
222	WARM CAL SAMPLE 7 CH 3	16004	800	WARM CAL SAMPLE 24 CH 3	16004
224	CH 4	16983	802	CH 4	16983
226	CH 5	15382	804	CH 5	15382
228	CH 6	16432	806	CH 6	16431
230	CH 7	16497	808	CH 7	16496
232	CH 8	15753	810	CH 8	15754
234	CH 9	15989	812	CH 9	15989
236	CH 10	17162	814	CH 10	17162
238	CH 11	19094	816	CH 11	19092
240	CH 12	19369	818	CH 12	19369
242	CH 13	18142	820	CH 13	18130
244	CH 14	19295	822	CH 14	19294
246	CH 15	16673	824	CH 15	16674
248	REFLECTOR 1 POSITION 8	10525	826	REFLECTOR 1 POSITION 25	10525
250	REFLECTOR 2 POSITION 8	10283	828	REFLECTOR 2 POSITION 25	10283
252	REFL 1 POS 8 2ND LOOK	10525	830	REFL 1 POS 25 2ND LOOK	10525
254	REFL 2 POS 8 2ND LOOK	10283	832	REFL 2 POS 25 2ND LOOK	10283
256	WARM CAL SAMPLE 8 CH 3	16002	834	WARM CAL SAMPLE 25 CH 3	15998
258	CH 4	16979	836	CH 4	16977
260	CH 5	15379	838	CH 5	15380
262	CH 6	16433	840	CH 6	16431
264	CH 7	16496	842	CH 7	16494
266	CH 8	15757	844	CH 8	15755
268	CH 9	15992	846	CH 9	15988
270	CH 10	17162	848	CH 10	17163
272	CH 11	19095	850	CH 11	19089
274	CH 12	19383	852	CH 12	19367
276	CH 13	18127	854	CH 13	18135
278	CH 14	19284	856	CH 14	19284
280	CH 15	16673	858	CH 15	16673
282	REFLECTOR 1 POSITION 9	10525	860	REFLECTOR 1 POSITION 26	10525
284	REFLECTOR 2 POSITION 9	10283	862	REFLECTOR 2 POSITION 26	10283
286	REFL 1 POS 9 2ND LOOK	10525	864	REFL 1 POS 26 2ND LOOK	10525
288	REFL 2 POS 9 2ND LOOK	10283	866	REFL 2 POS 26 2ND LOOK	10283
290	WARM CAL SAMPLE 9 CH 3	15999	868	WARM CAL SAMPLE 26 CH 3	16002
292	CH 4	16980	870	CH 4	16983

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
294	CH 5	15384	872	CH 5	15379
296	CH 6	16430	874	CH 6	16432
298	CH 7	16496	876	CH 7	16495
300	CH 8	15753	878	CH 8	15755
302	CH 9	15991	880	CH 9	15990
304	CH 10	17159	882	CH 10	17157
306	CH 11	19096	884	CH 11	19093
308	CH 12	19356	886	CH 12	19369
310	CH 13	18134	888	CH 13	18130
312	CH 14	19296	890	CH 14	19289
314	CH 15	16673	892	CH 15	16673
316	REFLECTOR 1 POSITION 10	10525	894	REFLECTOR 1 POSITION 27	10525
318	REFLECTOR 2 POSITION 10	10283	896	REFLECTOR 2 POSITION 27	10283
320	REFL 1 POS 10 2ND LOOK	10525	898	REFL 1 POS 27 2ND LOOK	10525
322	REFL 2 POS 10 2ND LOOK	10283	900	REFL 2 POS 27 2ND LOOK	10283
324	WARM CAL SAMPLE 10 CH 3	16008	902	WARM CAL SAMPLE 27 CH 3	16005
326	CH 4	16981	904	CH 4	16981
328	CH 5	15381	906	CH 5	15381
330	CH 6	16431	908	CH 6	16431
332	CH 7	16495	910	CH 7	16496
334	CH 8	15756	912	CH 8	15757
336	CH 9	15991	914	CH 9	15988
338	CH 10	17159	916	CH 10	17159
340	CH 11	19096	918	CH 11	19092
342	CH 12	19366	920	CH 12	19365
344	CH 13	18129	922	CH 13	18126
346	CH 14	19299	924	CH 14	19303
348	CH 15	16673	926	CH 15	16671
350	REFLECTOR 1 POSITION 11	10525	928	REFLECTOR 1 POSITION 28	10525
352	REFLECTOR 2 POSITION 11	10283	930	REFLECTOR 2 POSITION 28	10283
354	REFL 1 POS 11 2ND LOOK	10525	932	REFL 1 POS 28 2ND LOOK	10525
356	REFL 2 POS 11 2ND LOOK	10283	934	REFL 2 POS 28 2ND LOOK	10283
358	WARM CAL SAMPLE 11 CH 3	16007	936	WARM CAL SAMPLE 28 CH 3	16004
360	CH 4	16982	938	CH 4	16980
362	CH 5	15380	940	CH 5	15384
364	CH 6	16436	942	CH 6	16432
366	CH 7	16495	944	CH 7	16492
368	CH 8	15757	946	CH 8	15753
370	CH 9	15988	948	CH 9	15989
372	CH 10	17157	950	CH 10	17155
374	CH 11	19090	952	CH 11	19092
376	CH 12	19373	954	CH 12	19363
378	CH 13	18129	956	CH 13	18120
380	CH 14	19273	958	CH 14	19297
382	CH 15	16672	960	CH 15	16673
384	REFLECTOR 1 POSITION 12	10525	962	REFLECTOR 1 POSITION 29	10525
386	REFLECTOR 2 POSITION 12	10283	964	REFLECTOR 2 POSITION 29	10283
388	REFL 1 POS 12 2ND LOOK	10525	966	REFL 1 POS 29 2ND LOOK	10525
390	REFL 2 POS 12 2ND LOOK	10283	968	REFL 2 POS 29 2ND LOOK	10283
392	WARM CAL SAMPLE 12 CH 3	16001	970	WARM CAL SAMPLE 29 CH 3	16002

AMSU A1_29 A1.EXE DIGITAL A DATA 3-MAR-00 03:27:44 PAGE 5

WARM CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
394	CH 4	16979	972	CH 4	16980
396	CH 5	15382	974	CH 5	15382
398	CH 6	16432	976	CH 6	16429
400	CH 7	16496	978	CH 7	16493
402	CH 8	15754	980	CH 8	15754
404	CH 9	15989	982	CH 9	15990
406	CH 10	17161	984	CH 10	17164
408	CH 11	19099	986	CH 11	19093
410	CH 12	19376	988	CH 12	19366
412	CH 13	18130	990	CH 13	18137
414	CH 14	19305	992	CH 14	19289
416	CH 15	16675	994	CH 15	16672
418	REFLECTOR 1 POSITION 13	10525	996	REFLECTOR 1 POSITION 30	10525
420	REFLECTOR 2 POSITION 13	10283	998	REFLECTOR 2 POSITION 30	10283
422	REFL 1 POS 13 2ND LOOK	10525	1000	REFL 1 POS 30 2ND LOOK	10525
424	REFL 2 POS 13 2ND LOOK	10283	1002	REFL 2 POS 30 2ND LOOK	10283
426	WARM CAL SAMPLE 13 CH 3	16002	1004	WARM CAL SAMPLE 30 CH 3	16007
428	CH 4	16987	1006	CH 4	16979
430	CH 5	15385	1008	CH 5	15384
432	CH 6	16431	1010	CH 6	16433
434	CH 7	16497	1012	CH 7	16496
436	CH 8	15759	1014	CH 8	15759
438	CH 9	15989	1016	CH 9	15990
440	CH 10	17162	1018	CH 10	17158
442	CH 11	19093	1020	CH 11	19098
444	CH 12	19365	1022	CH 12	19363
446	CH 13	18137	1024	CH 13	18141
448	CH 14	19291	1026	CH 14	19305
450	CH 15	16672	1028	CH 15	16674
452	REFLECTOR 1 POSITION 14	10525	1030	REFLECTOR 1 COLD CAL POS	0E
454	REFLECTOR 2 POSITION 14	10283	1032	REFLECTOR 2 COLD CAL POS	0E
456	REFL 1 POS 14 2ND LOOK	10525	1034	REFL 1 COLD CAL 2ND LOOK	0E
458	REFL 2 POS 14 2ND LOOK	10283	1036	REFL 2 COLD CAL 2ND LOOK	0E
460	WARM CAL SAMPLE 14 CH 3	16000	1038	COLD CAL DATA 1 CH 3	0
462	CH 4	16980	1040	CH 4	0
464	CH 5	15384	1042	CH 5	0
466	CH 6	16435	1044	CH 6	0
468	CH 7	16495	1046	CH 7	0
470	CH 8	15756	1048	CH 8	0
472	CH 9	15989	1050	CH 9	0
474	CH 10	17163	1052	CH 10	0
476	CH 11	19094	1054	CH 11	0
478	CH 12	19367	1056	CH 12	0
480	CH 13	18140	1058	CH 13	0
482	CH 14	19292	1060	CH 14	0
484	CH 15	16672	1062	CH 15	0
486	REFLECTOR 1 POSITION 15	10525	1064	COLD CAL DATA 2 CH 3	0
488	REFLECTOR 2 POSITION 15	10283	1066	CH 4	0
490	REFL 1 POS 15 2ND LOOK	10525	1068	CH 5	0
492	REFL 2 POS 15 2ND LOOK	10283	1070	CH 6	0

WARM CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
494	WARM CAL SAMPLE 15 CH 3	16006	1072	CH 7	0
496	CH 4	16980	1074	CH 8	0
498	CH 5	15382	1076	CH 9	0
500	CH 6	16433	1078	CH 10	0
502	CH 7	16495	1080	CH 11	0
504	CH 8	15758	1082	CH 12	0
506	CH 9	15987	1084	CH 13	0
508	CH 10	17162	1086	CH 14	0
510	CH 11	19093	1088	CH 15	0
512	CH 12	19361	1182	REFLECTOR 1 WARM CAL POS	0E
514	CH 13	18125	1184	REFLECTOR 2 WARM CAL POS	0E
516	CH 14	19297	1186	REFL 1 WARM CAL 2ND LOOK	0E
518	CH 15	16674	1188	REFL 2 WARM CAL 2ND LOOK	0E
520	REFLECTOR 1 POSITION 16	10525	1190	WARM CAL DATA 1 CH 3	0
522	REFLECTOR 2 POSITION 16	10283	1192	CH 4	0
524	REFL 1 POS 16 2ND LOOK	10525	1194	CH 5	0
526	REFL 2 POS 16 2ND LOOK	10283	1196	CH 6	0
528	WARM CAL SAMPLE 16 CH 3	16003	1198	CH 7	0
530	CH 4	16980	1200	CH 8	0
532	CH 5	15382	1202	CH 9	0
534	CH 6	16434	1204	CH 10	0
536	CH 7	16496	1206	CH 11	0
538	CH 8	15756	1208	CH 12	0
540	CH 9	15989	1210	CH 13	0
542	CH 10	17160	1212	CH 14	0
544	CH 11	19092	1214	CH 15	0
546	CH 12	19371	1216	WARM CAL DATA 2 CH 3	0
548	CH 13	18122	1218	CH 4	0
550	CH 14	19298	1220	CH 5	0
552	CH 15	16672	1222	CH 6	0
554	REFLECTOR 1 POSITION 17	10525	1224	CH 7	0
556	REFLECTOR 2 POSITION 17	10283	1226	CH 8	0
558	REFL 1 POS 17 2ND LOOK	10525	1228	CH 9	0
560	REFL 2 POS 17 2ND LOOK	10283	1230	CH 10	0
562	WARM CAL SAMPLE 17 CH 3	16002	1232	CH 11	0
564	CH 4	16983	1234	CH 12	0
566	CH 5	15382	1236	CH 13	0
568	CH 6	16433	1238	CH 14	0
570	CH 7	16496	1240	CH 15	0

WARM CAL MODE

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
1090	SCAN MOTOR A1-1	18606	24.39
1092	SCAN MOTOR A1-2	19310	25.88
1094	FEEDHORN A1-1	19695	26.14
1096	FEEDHORN A1-2	20693	28.11
1098	RF MUX A1-1	20268	28.14
1100	RF MUX A1-2	21530	30.16
1102	LOCAL OSCILLATOR CHANNEL 3	22130	31.70
1104	LOCAL OSCILLATOR CHANNEL 4	22941	32.32
1106	LOCAL OSCILLATOR CHANNEL 5	22018	31.45
1108	LOCAL OSCILLATOR CHANNEL 6	20898	28.72
1110	LOCAL OSCILLATOR CHANNEL 7	21104	29.08
1112	LOCAL OSCILLATOR CHANNEL 8	22271	31.49
1114	LOCAL OSCILLATOR CHANNEL 15	21863	31.02
1116	PLL LO #2 CHANNELS 9 THROUGH 14	20245	27.71
1118	PLL LO #1 CHANNELS 9 THROUGH 14	23326	33.76
1120	SPARE (NOT USED)	32767	52.55
1122	MIXER/IF AMPLIFIER CHANNEL 3	21561	30.51
1124	MIXER/IF AMPLIFIER CHANNEL 4	21793	30.65
1126	MIXER/IF AMPLIFIER CHANNEL 5	21445	30.52
1128	MIXER/IF AMPLIFIER CHANNEL 6	20793	28.66
1130	MIXER/IF AMPLIFIER CHANNEL 7	20943	29.04
1132	MIXER/IF AMPLIFIER CHANNEL 8	21770	30.71
1134	MIXER/IF AMPLIFIER CH 9 THRU 14	20440	28.07
1136	MIXER/IF AMPLIFIER CHANNEL 15	21486	30.29
1138	IF AMPLIFIER CHANNEL 11 THRU 14	21525	30.22
1140	IF AMPLIFIER CHANNEL 9	21811	30.34
1142	IF AMPLIFIER CHANNEL 10	21634	30.41
1144	IF AMPLIFIER CHANNEL 11	20884	28.37
1146	DC/DC CONVERTER	22966	32.62
1148	IF AMPLIFIER CHANNEL 13	20599	28.41
1150	IF AMPLIFIER CHANNEL 14	20766	28.39
1152	IF AMPLIFIER CHANNEL 12	20212	28.45
1154	RF SHELF A1-1	21069	28.95
1156	RF SHELF A1-2	21690	30.12
1158	DETECTOR/PREAMPLIFIER ASSEMBLY	19816	26.62
1160	A1-1 WARM LOAD 1	23670	24.54
1162	A1-1 WARM LOAD 2	23708	24.55
1164	A1-1 WARM LOAD 3	23763	24.59
1166	A1-1 WARM LOAD 4	23627	24.63
1168	A1-1 WARM LOAD CENTER	24048	24.54
1170	A1-2 WARM LOAD 1	24656	26.60
1172	A1-2 WARM LOAD 2	24792	26.54
1174	A1-2 WARM LOAD 3	24685	26.60
1176	A1-2 WARM LOAD 4	24527	26.60
1178	A1-2 WARM LOAD CENTER	24954	26.59
1180	TEMP SENSOR REFERENCE VOLTAGE	25045	

WARM CAL MODE

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER A1-1 POWER	ON	ON	ON
SCANNER A1-2 POWER	ON	ON	ON
PLL POWER	PLLO # 1	PLLO # 1	PLLO # 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	215	19.4	215	19.4	215	19.4
A1-2 SCANNER MOTOR TEMPERATURE	217	22.1	217	22.1	217	22.1
A1-1 RF SHELF TEMPERATURE	216	20.7	216	20.7	216	20.7
A1-2 RF SHELF TEMPERATURE	220	26.2	220	26.2	220	26.2
A1-1 WARM LOAD TEMPERATURE	216	20.7	216	20.7	216	20.7
A1-2 WARM LOAD TEMPERATURE	217	22.1	217	22.1	217	22.1

DESCRIPTION	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG)	66	30.76	58	27.03	51	23.77
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG)	55	25.63	48	22.37	41	19.11
SIGNAL PROCESSING +15 VDC	170	14.67	170	14.67	170	14.67
ANTENNA DRIVE +15 VDC	170	14.67	170	14.67	170	14.67
SIGNAL PROCESSING -15 VDC	148	-15.15	148	-15.15	148	-15.15
ANTENNA DRIVE -15 VDC	148	-15.15	148	-15.15	148	-15.15
RECEIVER AMPLIFIER +8 VDC	156	7.80	156	7.80	156	7.80
SIGNAL PROCESSOR +5 VDC	145	4.83	145	4.83	145	4.83
ANTENNA DRIVE +5 VDC	145	4.83	145	4.83	145	4.83
RECEIVER MIXER/IF +10 VDC	169	9.76	168	9.71	168	9.71
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC	168	14.50	168	14.50	168	14.50
PHASE LOCK LOOP (CHANNEL 9/14) -15 VDC	143	-15.40	143	-15.40	143	-15.40
L.O. VOLTAGE (CHANNEL 8) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 7) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 6) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 3) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 4) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 5) VDC	170	9.73	171	9.78	171	9.78
PLLO # 2 LOCK DETECT	2	0.04	2	0.04	2	0.04
PLLO # 1 LOCK DETECT	218	4.36	218	4.36	218	4.36
L.O. VOLTAGE (CHANNEL 15) VDC	170	14.67	170	14.67	170	14.67

WARM CAL MODE

PRT TEMPERATURES

	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
VARIABLE TARGET	615	42.00	601	14.00
	616	43.00	602	15.00
	617	44.00	603	16.00
	618	45.00	604	17.00
	619	46.00	605	18.00
	620	47.00	606	19.00
	621	48.00	607	20.00
FIXED TARGET	622	49.00	608	21.00
	623	50.00	609	22.00
	624	51.00	610	23.00
	625	52.00	611	24.00
	626	53.00	612	25.00
	627	67.00	613	69.00
	628	68.00	614	70.00
	629	71.00	630	72.00
BASEPLATE	631	26.00	632	27.00

THERMOCOUPLE TEMPERATURES

	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
FIXED TARGET SHROUD	558	5.00	537	34.00
	559	6.00	538	35.00
VARIABLE TARGET SHROUD	550	7.00	524	36.00
	551	8.00	525	37.00
FIXED TARGET N2	506	57.00	502	30.00
	507	58.00	503	31.00
VARIABLE TARGET N2	516	59.00	511	32.00
	517	60.00	512	33.00
HEATER N2	514	1.00	509	38.00
	515	2.00	510	39.00
FIXED TARGET FLOW METER	508	63.00	504	61.00
VARIABLE TARGET FLOW METER	518	64.00	513	62.00
BASEPLATE HEATER N2	519	3.00	520	4.00
BASEPLATE N2	521	9.00	522	10.00
BASEPLATE FLOW METER	523	65.00		
ADJUNCT RADIATORS	575	73.00	577	74.00
	579	75.00	581	76.00

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)

BP	A1-1 Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2	10525	10530	P
15	3.2.4.3.4.4	2267	2262	P

WC = Warm Cal
15 = Nadir Position

BP	A1-2 Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2	10283	10288	P
15	3.2.4.3.4.4	2027	2020	P

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: 373237 S/N: 108

R. Heid 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

MSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:28:15 SCAN NUMBER 191

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

P	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	10525	10525	9	10525	10525	17	10525	10525	25	10525	10525
2	10525	10525	10	10525	10525	18	10525	10525	26	10525	10525
3	10525	10525	11	10525	10525	19	10525	10525	27	10525	10525
4	10525	10525	12	10525	10525	20	10525	10525	28	10525	10525
5	10525	10525	13	10525	10525	21	10525	10525	29	10525	10525
6	10525	10525	14	10525	10525	22	10525	10525	30	10525	10525
7	10525	10525	15	10525	10525	23	10525	10525	CC	0	0
8	10525	10525	16	10525	10525	24	10525	10525	WC	0	0

21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

DS24

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:29:27 SCAN NUMBER 200

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	2267	2267	9	2267	2267	17	2267	2267	25	2268	2267
2	2268	2267	10	2267	2267	18	2268	2267	26	2267	2267
3	2267	2267	11	2268	2267	19	2267	2267	27	2268	2267
4	2267	2268	12	2267	2267	20	2268	2268	28	2267	2267
5	2267	2267	13	2268	2267	21	2267	2267	29	2267	2268
6	2267	2268	14	2267	2267	22	2267	2268	30	2267	2267
7	2267	2267	15	2267	2268	23	2267	2267	CC	0	0
8	2267	2268	16	2267	2267	24	2267	2267	WC	0	0

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS24

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:28:30 SCAN NUMBER 193

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	10283	10283	9	10283	10283	17	10283	10283	25	10283	10283
2	10283	10283	10	10283	10283	18	10283	10283	26	10283	10283
3	10283	10283	11	10283	10283	19	10283	10283	27	10283	10283
4	10283	10283	12	10283	10283	20	10283	10283	28	10283	10283
5	10283	10283	13	10283	10283	21	10283	10283	29	10283	10283
6	10283	10283	14	10283	10283	22	10283	10283	30	10283	10283
7	10283	10283	15	10283	10283	23	10283	10283	CC	0	0
8	10283	10283	16	10283	10283	24	10283	10283	WC	0	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 24

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:29:38 SCAN NUMBER 201

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	2027	2027	9	2027	2027	17	2027	2027	25	2027	2027
2	2027	2027	10	2027	2027	18	2027	2027	26	2027	2027
3	2027	2027	11	2027	2027	19	2027	2027	27	2027	2027
4	2027	2027	12	2027	2027	20	2027	2027	28	2027	2027
5	2027	2027	13	2027	2027	21	2027	2027	29	2027	2027
6	2027	2027	14	2027	2027	22	2027	2027	30	2027	2027
7	2027	2027	15	2027	2027	23	2027	2027	CC	0	0
8	2027	2027	16	2027	2027	24	2027	2027	WC	0	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS24

TEST DATA SHEET 25

Digital-A Data Output Warm Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.2)

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail P	Element (For Ref)	Measured*	Required**	Pass/Fail P
01	0018	15994	16,500 ± 4000		0030	15969	16500 ± 4000	
02	0052	15989			0064	15969		
03	0086	15991			0098	15968		
04	0120	15989			0132	15967		
05	0154	15986			0166	15968		
06	0188	15990			0200	15968		
07	0222	15987			0234	15964		
08	0256	15987			0268	15968		
09	0290	15986			0302	15966		
10	0324	15990			0336	15968		
11	0356	15988			0370	15966		
12	0392	15987			0404	15971		
13	0426	15987			0438	15972		
14	0460	15995			0472	15969		
15	0494	15986			0506	15973		
16	0528	15982			0540	15967		
17	0562	15985			0574	15967		
18	0596	15987			0608	15971		
19	0630	15987			0642	15973		
20	0664	15986			0676	15968		
21	0698	15986			0710	15970		
22	0732	15992			0744	15966		
23	0766	15990			0778	15968		
24	0800	15987			0812	15968		
25	0834	15986			0846	15968		
26	0868	15987			0880	15969		
27	0902	15995			0914	15969		
28	0936	15988			0948	15969		
29	0970	15985			0982	15970		
30	1004	15984	16,500±4000		1016	15968	16500±4000	
CC	1038	0	0		1050	0	0	
WC	1190	0	0		1202	0	0	

* 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: 373237 S/N: 108

R. Haid 3/3/00

Test Systems Engineer Date

3-4-00

Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00

Quality Control Date

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:33:09 SCAN NUMBER 228
[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 9

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	15969	9	15966	17	15967	25	15968
2	15969	10	15968	18	15971	26	15969
3	15968	11	15966	19	15973	27	15969
4	15967	12	15971	20	15968	28	15969
5	15968	13	15972	21	15970	29	15970
6	15968	14	15969	22	15966	30	15968
7	15964	15	15973	23	15968	CC	0
8	15968	16	15967	24	15968	WC	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN
SELECT TOUCHSCREEN BUTTON 2

TDS25

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:32:55 SCAN NUMBER 226

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 3

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	15994	9	15986	17	15985	25	15986
2	15989	10	15990	18	15987	26	15987
3	15991	11	15988	19	15987	27	15995
4	15989	12	15987	20	15986	28	15988
5	15986	13	15987	21	15986	29	15985
6	15990	14	15995	22	15992	30	15984
7	15987	15	15986	23	15990	CC	0
8	15987	16	15982	24	15987	WC	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

DS25

TEST DATA SHEET 26 (Sheet 1 of 2)
Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

Thermistor Sensors Element	Thermistor Sensors Description	Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
1090	A1-1 Warm Load 1	24.56	25 ± 15	PASS
1092	A1-1 Warm Load 2	24.56	25 ± 15	
1094	A1-1 Warm Load 3	24.61	25 ± 15	
1096	A1-1 Warm Load 4	24.63	25 ± 15	
1098	A1-1 Warm Load Center	24.56	25 ± 15	
1100	A1-2 Warm Load 1	26.63	25 ± 15	
1102	A1-2 Warm Load 2	26.56	25 ± 15	
1104	A1-2 Warm Load 3	26.61	25 ± 15	
1106	A1-2 Warm Load 4	26.61	25 ± 15	
1108	A1-2 Warm Load Center	26.61	25 ± 15	
1110	Local Oscillator Channel 7	29.45	25 ± 15	
1112	Local Oscillator Channel 8	31.49	25 ± 15	
1114	Local Oscillator Channel 15	31.52	25 ± 15	
1116	PLL LO #2 Channels 9-14	28.12	25 ± 15	
1118	PLL LO #1 Channels 9-14	34.44	25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***	N/A AMSU 6 SEIT		
1122	Mixer I.F. Amp. Channel 3	31.04	25 ± 15	
1124	Mixer I.F. Amp. Channel 4	31.18	25 ± 15	
1126	Mixer I.F. Amp. Channel 5	31.06	25 ± 15	
1128	Mixer I.F. Amp. Channel 6	29.04	25 ± 15	
1130	Mixer I.F. Amp. Channel 7	29.47	25 ± 15	
1132	Mixer I.F. Amp. Channel 8	31.23	25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14	28.45	25 ± 15	
1136	Mixer I.F. Amp. Channel 15	30.72	25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14	30.75	25 ± 15	PASS
1140	I.F. Amp. Channel 9	30.89	25 ± 15	
1142	I.F. Amp. Channel 10	30.96	25 ± 15	
1144	I.F. Amp. Channel 11	28.71	25 ± 15	
1146	DC/DC Converter	33.29	25 ± 15	
1148	I.F. Amp. Channel 13	28.75	25 ± 15	
1150	I.F. Amp. Channel 14	28.73	25 ± 15	
1152	I.F. Amp. Channel 12	28.80	25 ± 15	
1154	RF Shelf A1-1	29.43	25 ± 15	
1156	RF Shelf A1-2	30.64	25 ± 15	
1158	Detector Preamp Assy.	26.89	25 ± 15	
1160	Scan Motor A1-1	24.33	25 ± 15	
1162	Scan Motor A1-2	25.86	25 ± 15	
1164	Feed Horn A1-1	26.38	25 ± 15	
1166	Feed Horn A1-2	28.49	25 ± 15	
1168	R.F. Mux A1-1	28.51	25 ± 15	
1170	R.F. Mux A1-2	30.67	25 ± 15	
1172	Local Oscillator Channel 3	32.21	25 ± 15	
1174	Local Oscillator Channel 4	32.82	25 ± 15	
1176	Local Oscillator Channel 5	31.93	25 ± 15	
1178	Local Oscillator Channel 6	28.98	25 ± 15	
1180	Temp Sensor Ref Voltage Count	25045	**	

* 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: 373237 S/N: 108

R. Haigh 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3/3/00
Quality Control Date

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:33:30 SCAN NUMBER 231
[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 1 TO 16

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR A1-1	18574	24.33	9	LO CHANNEL 5	22265	31.93
2	SCAN MOTOR A1-2	19300	25.86	10	LO CHANNEL 6	21032	28.98
3	FEEDHORN A1-1	19817	26.38	11	LO CHANNEL 7	21298	29.45
4	FEEDHORN A1-2	20889	28.49	12	LO CHANNEL 8	22527	31.99
5	RF MUX A1-1	20462	28.51	13	LO CHANNEL 15	22124	31.52
6	RF MUX A1-2	21792	30.67	14	PLLO #2 CH 9/14	20455	28.12
7	LO CHANNEL 3	22381	32.21	15	PLLO #1 CH 9/14	23674	34.44
8	LO CHANNEL 4	23200	32.82	16	PLLO REFERENCE	32767	52.55

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN
SELECT TOUCHSCREEN BUTTON 2

TD526

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:33:41 SCAN NUMBER 232

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 17 TO 32

NO		DATA	TEMP C	NO		DATA	TEMP C
17	MIXER IF CH 3	21831	31.04	25	IF AMP CH 11/14	21798	30.75
18	MIXER IF CH 4	22068	31.18	26	IF AMP CH 9	22091	30.89
19	MIXER IF CH 5	21722	31.06	27	IF AMP CH 10	21916	30.96
20	MIXER IF CH 6	20989	29.04	28	IF AMP CH 11	21063	28.71
21	MIXER IF CH 7	21164	29.47	29	DC/DC CONVERTER	23307	33.29
22	MIXER IF CH 8	22040	31.23	30	IF AMP CH 13	20778	28.75
23	MIXER IF CH 9/14	20636	28.45	31	IF AMP CH 14	20943	28.73
24	MIXER IF CH 15	21730	30.72	32	IF AMP CH 12	20392	28.80

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 26

AMSU A1-29 A1.EXE WARM CAL MODE P1 3-MAR-00 03:33:49 SCAN NUMBER 233

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 31 TO 46

NO	DATA	TEMP C	NO	DATA	TEMP C
31 IF AMP CH 14	20946	28.73	39 A1-1 WARM LOAD 4	23628	24.63
32 IF AMP CH 12	20395	28.81	40 A1-1 WARM LOAD C	24055	24.56
33 RF SHELF A1-1	21320	29.43	41 A1-2 WARM LOAD 1	24671	26.63
34 RF SHELF A1-2	21959	30.64	42 A1-2 WARM LOAD 2	24804	26.56
35 DETECTOR/PREAMP	19953	26.89	43 A1-2 WARM LOAD 3	24693	26.61
36 A1-1 WARM LOAD 1	23680	24.56	44 A1-2 WARM LOAD 4	24534	26.61
37 A1-1 WARM LOAD 2	23712	24.56	45 A1-2 WARM LOAD C	24960	26.61
38 A1-1 WARM LOAD 3	23771	24.61	THERMAL REFERENCE	25045	

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 26

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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	P
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	29	*	
[III]	0005	Digital-B Data Byte 1	8	8	
	0006	Digital-B Data Byte 2	14	14	
	0007	Digital-B Data Byte 3	0	0	
	0008	Digital-B Data Byte 4	0	0	

* AMSU A1 Identification Words (data entered in decimal system)	Binary	Decimal
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: 373237 S/N: 108

R. Haight 3/3/00
Test Systems Engineer Date

7A 194
Quality Control 3-3-00 Date

3-4-00
Customer Representative (Flight Hardware Only) Date

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AMSU  A1-29 A1.EXE    COLD CAL MODE      P1  3-MAR-00 03:36:20  SCAN NUMBER   252
[ 5 ] DIGITAL A DATA  ELEMENT 0000
[ 6 ] DIGITAL B DATA  ELEMENT   00
[ 7 ] ANALOG DATA     ELEMENT   00

                                       COMMANDS
[ 9 ]  MODULE POWER =        CONNECT      ANTENNA IN COLD CAL POSIT = YES [ 15 ]
[ 10 ] SURVIVAL HEATER POWER =     OFF    ANTENNA IN NADIR POSITION = NO  [ 16 ]
[ 11 ] MODULE TOTALLY OFF =        ON     ANTENNA IN FULL SCAN MODE = NO  [ 17 ]
[ 12 ] SCANNER A1 - 1 POWER =      ON     PLL POWER =           PLLO # 1  [ 18 ]
[ 13 ] SCANNER A1 - 2 POWER =      ON     COLD CAL POSITION MSB =    ZERO [ 19 ]
[ 14 ] ANTENNA IN WARM CAL POSIT = NO     COLD CAL POSITION LSB =    ZERO [ 20 ]
          POWER [ 4 ]  ON
                       SCREEN ONLY [ 2 ]  PRINT  [ 3 ] FULL      [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 3
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DS27

AMSU A1_29 A1.EXE DIGITAL A DATA 3-MAR-00 03:36:24 PAGE 1
COLD CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	572	COLD CAL SAMPLE 17 CH 8	15736
2	SYNC SEQUENCE BYTE 2	11111111	574	CH 9	15959
3	SYNC SEQUENCE BYTE 3	11111111	576	CH 10	17124
4	UNIT ID AND SERIAL NO	00011101	578	CH 11	19018
5	DIGITAL B DATA BYTE 1	00001000	580	CH 12	19288
6	DIGITAL B DATA BYTE 2	00001110	582	CH 13	18059
7	DIGITAL B DATA BYTE 3	00000000	584	CH 14	19211
8	DIGITAL B DATA BYTE 4	00000000	586	CH 15	16634
10	REFLECTOR 1 POSITION 1	6124	588	REFLECTOR 1 POSITION 18	6124
12	REFLECTOR 2 POSITION 1	5885	590	REFLECTOR 2 POSITION 18	5885
14	REFL 1 POS 1 2ND LOOK	6124	592	REFL 1 POS 18 2ND LOOK	6124
16	REFL 2 POS 1 2ND LOOK	5885	594	REFL 2 POS 18 2ND LOOK	5885
18	COLD CAL SAMPLE 1 CH 3	16006	596	COLD CAL SAMPLE 18 CH 3	16004
20	CH 4	16962	598	CH 4	16963
22	CH 5	15358	600	CH 5	15358
24	CH 6	16412	602	CH 6	16408
26	CH 7	16477	604	CH 7	16479
28	CH 8	15735	606	CH 8	15734
30	CH 9	15962	608	CH 9	15966
32	CH 10	17129	610	CH 10	17122
34	CH 11	19019	612	CH 11	19020
36	CH 12	19287	614	CH 12	19292
38	CH 13	18053	616	CH 13	18064
40	CH 14	19174	618	CH 14	19214
42	CH 15	16633	620	CH 15	16635
44	REFLECTOR 1 POSITION 2	6124	622	REFLECTOR 1 POSITION 19	6124
46	REFLECTOR 2 POSITION 2	5885	624	REFLECTOR 2 POSITION 19	5885
48	REFL 1 POS 2 2ND LOOK	6124	626	REFL 1 POS 19 2ND LOOK	6123
50	REFL 2 POS 2 2ND LOOK	5884	628	REFL 2 POS 19 2ND LOOK	5884
52	COLD CAL SAMPLE 2 CH 3	16004	630	COLD CAL SAMPLE 19 CH 3	16004
54	CH 4	16960	632	CH 4	16962
56	CH 5	15360	634	CH 5	15357
58	CH 6	16412	636	CH 6	16412
60	CH 7	16481	638	CH 7	16478
62	CH 8	15736	640	CH 8	15737
64	CH 9	15961	642	CH 9	15962
66	CH 10	17128	644	CH 10	17130
68	CH 11	19027	646	CH 11	19020
70	CH 12	19298	648	CH 12	19277
72	CH 13	18064	650	CH 13	18043
74	CH 14	19190	652	CH 14	19196
76	CH 15	16634	654	CH 15	16634
78	REFLECTOR 1 POSITION 3	6123	656	REFLECTOR 1 POSITION 20	6123
80	REFLECTOR 2 POSITION 3	5885	658	REFLECTOR 2 POSITION 20	5885
82	REFL 1 POS 3 2ND LOOK	6124	660	REFL 1 POS 20 2ND LOOK	6123
84	REFL 2 POS 3 2ND LOOK	5885	662	REFL 2 POS 20 2ND LOOK	5885
86	COLD CAL SAMPLE 3 CH 3	15997	664	COLD CAL SAMPLE 20 CH 3	16004
88	CH 4	16963	666	CH 4	16961
90	CH 5	15357	668	CH 5	15359
92	CH 6	16413	670	CH 6	16410

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	CH 7	16478	672	CH 7	16476
96	CH 8	15736	674	CH 8	15736
98	CH 9	15963	676	CH 9	15960
100	CH 10	17126	678	CH 10	17123
102	CH 11	19021	680	CH 11	19019
104	CH 12	19287	682	CH 12	19291
106	CH 13	18070	684	CH 13	18059
108	CH 14	19192	686	CH 14	19185
110	CH 15	16636	688	CH 15	16633
112	REFLECTOR 1 POSITION 4	6123	690	REFLECTOR 1 POSITION 21	6124
114	REFLECTOR 2 POSITION 4	5885	692	REFLECTOR 2 POSITION 21	5884
116	REFL 1 POS 4 2ND LOOK	6124	694	REFL 1 POS 21 2ND LOOK	6123
118	REFL 2 POS 4 2ND LOOK	5885	696	REFL 2 POS 21 2ND LOOK	5885
120	COLD CAL SAMPLE 4 CH 3	16002	698	COLD CAL SAMPLE 21 CH 3	16008
122	CH 4	16964	700	CH 4	16962
124	CH 5	15357	702	CH 5	15356
126	CH 6	16411	704	CH 6	16409
128	CH 7	16477	706	CH 7	16476
130	CH 8	15736	708	CH 8	15733
132	CH 9	15965	710	CH 9	15960
134	CH 10	17124	712	CH 10	17125
136	CH 11	19024	714	CH 11	19017
138	CH 12	19287	716	CH 12	19290
140	CH 13	18056	718	CH 13	18053
142	CH 14	19190	720	CH 14	19201
144	CH 15	16636	722	CH 15	16634
146	REFLECTOR 1 POSITION 5	6124	724	REFLECTOR 1 POSITION 22	6124
148	REFLECTOR 2 POSITION 5	5884	726	REFLECTOR 2 POSITION 22	5885
150	REFL 1 POS 5 2ND LOOK	6124	728	REFL 1 POS 22 2ND LOOK	6124
152	REFL 2 POS 5 2ND LOOK	5885	730	REFL 2 POS 22 2ND LOOK	5885
154	COLD CAL SAMPLE 5 CH 3	16006	732	COLD CAL SAMPLE 22 CH 3	16004
156	CH 4	16964	734	CH 4	16960
158	CH 5	15357	736	CH 5	15357
160	CH 6	16412	738	CH 6	16410
162	CH 7	16477	740	CH 7	16478
164	CH 8	15735	742	CH 8	15735
166	CH 9	15960	744	CH 9	15962
168	CH 10	17124	746	CH 10	17131
170	CH 11	19033	748	CH 11	19030
172	CH 12	19283	750	CH 12	19296
174	CH 13	18059	752	CH 13	18055
176	CH 14	19197	754	CH 14	19201
178	CH 15	16636	756	CH 15	16634
180	REFLECTOR 1 POSITION 6	6123	758	REFLECTOR 1 POSITION 23	6124
182	REFLECTOR 2 POSITION 6	5885	760	REFLECTOR 2 POSITION 23	5885
184	REFL 1 POS 6 2ND LOOK	6123	762	REFL 1 POS 23 2ND LOOK	6124
186	REFL 2 POS 6 2ND LOOK	5885	764	REFL 2 POS 23 2ND LOOK	5885
188	COLD CAL SAMPLE 6 CH 3	16003	766	COLD CAL SAMPLE 23 CH 3	16006
190	CH 4	16963	768	CH 4	16963
192	CH 5	15360	770	CH 5	15357

AMSU A1_29 A1.EXE DIGITAL A DATA COLD CAL MODE 3-MAR-00 03:36:24 PAGE 3

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
194	CH 6	16410	772	CH 6	16407
196	CH 7	16482	774	CH 7	16478
198	CH 8	15736	776	CH 8	15736
200	CH 9	15959	778	CH 9	15961
202	CH 10	17129	780	CH 10	17129
204	CH 11	19021	782	CH 11	19020
206	CH 12	19297	784	CH 12	19292
208	CH 13	18061	786	CH 13	18052
210	CH 14	19193	788	CH 14	19207
212	CH 15	16637	790	CH 15	16636
214	REFLECTOR 1 POSITION 7	6124	792	REFLECTOR 1 POSITION 24	6124
216	REFLECTOR 2 POSITION 7	5885	794	REFLECTOR 2 POSITION 24	5885
218	REFL 1 POS 7 2ND LOOK	6123	796	REFL 1 POS 24 2ND LOOK	6124
220	REFL 2 POS 7 2ND LOOK	5884	798	REFL 2 POS 24 2ND LOOK	5884
222	COLD CAL SAMPLE 7 CH 3	16002	800	COLD CAL SAMPLE 24 CH 3	15999
224	CH 4	16963	802	CH 4	16961
226	CH 5	15358	804	CH 5	15359
228	CH 6	16415	806	CH 6	16410
230	CH 7	16481	808	CH 7	16480
232	CH 8	15737	810	CH 8	15737
234	CH 9	15959	812	CH 9	15961
236	CH 10	17123	814	CH 10	17128
238	CH 11	19028	816	CH 11	19018
240	CH 12	19290	818	CH 12	19279
242	CH 13	18041	820	CH 13	18057
244	CH 14	19188	822	CH 14	19185
246	CH 15	16636	824	CH 15	16635
248	REFLECTOR 1 POSITION 8	6124	826	REFLECTOR 1 POSITION 25	6124
250	REFLECTOR 2 POSITION 8	5885	828	REFLECTOR 2 POSITION 25	5885
252	REFL 1 POS 8 2ND LOOK	6124	830	REFL 1 POS 25 2ND LOOK	6124
254	REFL 2 POS 8 2ND LOOK	5885	832	REFL 2 POS 25 2ND LOOK	5885
256	COLD CAL SAMPLE 8 CH 3	16005	834	COLD CAL SAMPLE 25 CH 3	16007
258	CH 4	16964	836	CH 4	16960
260	CH 5	15354	838	CH 5	15358
262	CH 6	16409	840	CH 6	16411
264	CH 7	16476	842	CH 7	16480
266	CH 8	15737	844	CH 8	15737
268	CH 9	15961	846	CH 9	15958
270	CH 10	17125	848	CH 10	17124
272	CH 11	19027	850	CH 11	19026
274	CH 12	19299	852	CH 12	19289
276	CH 13	18065	854	CH 13	18064
278	CH 14	19233	856	CH 14	19216
280	CH 15	16634	858	CH 15	16636
282	REFLECTOR 1 POSITION 9	6124	860	REFLECTOR 1 POSITION 26	6124
284	REFLECTOR 2 POSITION 9	5884	862	REFLECTOR 2 POSITION 26	5885
286	REFL 1 POS 9 2ND LOOK	6123	864	REFL 1 POS 26 2ND LOOK	6123
288	REFL 2 POS 9 2ND LOOK	5885	866	REFL 2 POS 26 2ND LOOK	5885
290	COLD CAL SAMPLE 9 CH 3	16006	868	COLD CAL SAMPLE 26 CH 3	16003
292	CH 4	16959	870	CH 4	16965

COLD CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
294	CH 5	15358	872	CH 5	15360
296	CH 6	16413	874	CH 6	16410
298	CH 7	16475	876	CH 7	16478
300	CH 8	15735	878	CH 8	15732
302	CH 9	15957	880	CH 9	15959
304	CH 10	17123	882	CH 10	17127
306	CH 11	19026	884	CH 11	19022
308	CH 12	19288	886	CH 12	19286
310	CH 13	18059	888	CH 13	18056
312	CH 14	19199	890	CH 14	19189
314	CH 15	16634	892	CH 15	16634
316	REFLECTOR 1 POSITION 10	6124	894	REFLECTOR 1 POSITION 27	6123
318	REFLECTOR 2 POSITION 10	5885	896	REFLECTOR 2 POSITION 27	5885
320	REFL 1 POS 10 2ND LOOK	6124	898	REFL 1 POS 27 2ND LOOK	6124
322	REFL 2 POS 10 2ND LOOK	5885	900	REFL 2 POS 27 2ND LOOK	5885
324	COLD CAL SAMPLE 10 CH 3	16004	902	COLD CAL SAMPLE 27 CH 3	16006
326	CH 4	16963	904	CH 4	16961
328	CH 5	15357	906	CH 5	15357
330	CH 6	16411	908	CH 6	16408
332	CH 7	16482	910	CH 7	16481
334	CH 8	15735	912	CH 8	15738
336	CH 9	15960	914	CH 9	15962
338	CH 10	17129	916	CH 10	17124
340	CH 11	19023	918	CH 11	19022
342	CH 12	19286	920	CH 12	19289
344	CH 13	18053	922	CH 13	18057
346	CH 14	19197	924	CH 14	19217
348	CH 15	16635	926	CH 15	16635
350	REFLECTOR 1 POSITION 11	6124	928	REFLECTOR 1 POSITION 28	6123
352	REFLECTOR 2 POSITION 11	5885	930	REFLECTOR 2 POSITION 28	5885
354	REFL 1 POS 11 2ND LOOK	6124	932	REFL 1 POS 28 2ND LOOK	6123
356	REFL 2 POS 11 2ND LOOK	5884	934	REFL 2 POS 28 2ND LOOK	5885
358	COLD CAL SAMPLE 11 CH 3	16004	936	COLD CAL SAMPLE 28 CH 3	16008
360	CH 4	16961	938	CH 4	16962
362	CH 5	15358	940	CH 5	15359
364	CH 6	16409	942	CH 6	16413
366	CH 7	16478	944	CH 7	16478
368	CH 8	15734	946	CH 8	15739
370	CH 9	15961	948	CH 9	15961
372	CH 10	17129	950	CH 10	17127
374	CH 11	19026	952	CH 11	19019
376	CH 12	19287	954	CH 12	19276
378	CH 13	18064	956	CH 13	18069
380	CH 14	19211	958	CH 14	19183
382	CH 15	16636	960	CH 15	16635
384	REFLECTOR 1 POSITION 12	6124	962	REFLECTOR 1 POSITION 29	6124
386	REFLECTOR 2 POSITION 12	5885	964	REFLECTOR 2 POSITION 29	5885
388	REFL 1 POS 12 2ND LOOK	6124	966	REFL 1 POS 29 2ND LOOK	6124
390	REFL 2 POS 12 2ND LOOK	5885	968	REFL 2 POS 29 2ND LOOK	5885
392	COLD CAL SAMPLE 12 CH 3	16005	970	COLD CAL SAMPLE 29 CH 3	16000

AMSU A1_29   A1.EXE   DIGITAL A DATA   3-MAR-00   03:36:24   PAGE 5

COLD CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
394	CH 4	16962	972	CH 4	16965
396	CH 5	15356	974	CH 5	15358
398	CH 6	16412	976	CH 6	16412
400	CH 7	16478	978	CH 7	16476
402	CH 8	15738	980	CH 8	15735
404	CH 9	15962	982	CH 9	15962
406	CH 10	17133	984	CH 10	17118
408	CH 11	19022	986	CH 11	19024
410	CH 12	19283	988	CH 12	19288
412	CH 13	18059	990	CH 13	18055
414	CH 14	19175	992	CH 14	19191
416	CH 15	16634	994	CH 15	16634
418	REFLECTOR 1 POSITION 13	6124	996	REFLECTOR 1 POSITION 30	6124
420	REFLECTOR 2 POSITION 13	5885	998	REFLECTOR 2 POSITION 30	5885
422	REFL 1 POS 13 2ND LOOK	6124	1000	REFL 1 POS 30 2ND LOOK	6123
424	REFL 2 POS 13 2ND LOOK	5885	1002	REFL 2 POS 30 2ND LOOK	5885
426	COLD CAL SAMPLE 13 CH 3	16005	1004	COLD CAL SAMPLE 30 CH 3	16001
428	CH 4	16964	1006	CH 4	16963
430	CH 5	15364	1008	CH 5	15358
432	CH 6	16411	1010	CH 6	16407
434	CH 7	16476	1012	CH 7	16478
436	CH 8	15731	1014	CH 8	15734
438	CH 9	15961	1016	CH 9	15960
440	CH 10	17129	1018	CH 10	17129
442	CH 11	19022	1020	CH 11	19022
444	CH 12	19295	1022	CH 12	19292
446	CH 13	18044	1024	CH 13	18043
448	CH 14	19206	1026	CH 14	19208
450	CH 15	16635	1028	CH 15	16633
452	REFLECTOR 1 POSITION 14	6124	1030	REFLECTOR 1 COLD CAL POS	0E
454	REFLECTOR 2 POSITION 14	5885	1032	REFLECTOR 2 COLD CAL POS	0E
456	REFL 1 POS 14 2ND LOOK	6124	1034	REFL 1 COLD CAL 2ND LOOK	0E
458	REFL 2 POS 14 2ND LOOK	5885	1036	REFL 2 COLD CAL 2ND LOOK	0E
460	COLD CAL SAMPLE 14 CH 3	16003	1038	COLD CAL DATA 1 CH 3	0
462	CH 4	16966	1040	CH 4	0
464	CH 5	15358	1042	CH 5	0
466	CH 6	16410	1044	CH 6	0
468	CH 7	16481	1046	CH 7	0
470	CH 8	15737	1048	CH 8	0
472	CH 9	15961	1050	CH 9	0
474	CH 10	17121	1052	CH 10	0
476	CH 11	19023	1054	CH 11	0
478	CH 12	19290	1056	CH 12	0
480	CH 13	18065	1058	CH 13	0
482	CH 14	19223	1060	CH 14	0
484	CH 15	16633	1062	CH 15	0
486	REFLECTOR 1 POSITION 15	6124	1064	COLD CAL DATA 2 CH 3	0
488	REFLECTOR 2 POSITION 15	5885	1066	CH 4	0
490	REFL 1 POS 15 2ND LOOK	6124	1068	CH 5	0
492	REFL 2 POS 15 2ND LOOK	5884	1070	CH 6	0

COLD CAL MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
494	COLD CAL SAMPLE 15 CH 3	16003	1072	CH 7	0
496	CH 4	16963	1074	CH 8	0
498	CH 5	15360	1076	CH 9	0
500	CH 6	16408	1078	CH 10	0
502	CH 7	16476	1080	CH 11	0
504	CH 8	15736	1082	CH 12	0
506	CH 9	15959	1084	CH 13	0
508	CH 10	17123	1086	CH 14	0
510	CH 11	19029	1088	CH 15	0
512	CH 12	19279	1182	REFLECTOR 1 WARM CAL POS	0E
514	CH 13	18051	1184	REFLECTOR 2 WARM CAL POS	0E
516	CH 14	19210	1186	REFL 1 WARM CAL 2ND LOOK	0E
518	CH 15	16635	1188	REFL 2 WARM CAL 2ND LOOK	0E
520	REFLECTOR 1 POSITION 16	6123	1190	WARM CAL DATA 1 CH 3	0
522	REFLECTOR 2 POSITION 16	5885	1192	CH 4	0
524	REFL 1 POS 16 2ND LOOK	6124	1194	CH 5	0
526	REFL 2 POS 16 2ND LOOK	5885	1196	CH 6	0
528	COLD CAL SAMPLE 16 CH 3	16004	1198	CH 7	0
530	CH 4	16963	1200	CH 8	0
532	CH 5	15362	1202	CH 9	0
534	CH 6	16411	1204	CH 10	0
536	CH 7	16478	1206	CH 11	0
538	CH 8	15733	1208	CH 12	0
540	CH 9	15961	1210	CH 13	0
542	CH 10	17130	1212	CH 14	0
544	CH 11	19019	1214	CH 15	0
546	CH 12	19290	1216	WARM CAL DATA 2 CH 3	0
548	CH 13	18072	1218	CH 4	0
550	CH 14	19189	1220	CH 5	0
552	CH 15	16635	1222	CH 6	0
554	REFLECTOR 1 POSITION 17	6123	1224	CH 7	0
556	REFLECTOR 2 POSITION 17	5884	1226	CH 8	0
558	REFL 1 POS 17 2ND LOOK	6123	1228	CH 9	0
560	REFL 2 POS 17 2ND LOOK	5885	1230	CH 10	0
562	COLD CAL SAMPLE 17 CH 3	16001	1232	CH 11	0
564	CH 4	16962	1234	CH 12	0
566	CH 5	15359	1236	CH 13	0
568	CH 6	16411	1238	CH 14	0
570	CH 7	16479	1240	CH 15	0

COLD CAL MODE

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
1090	SCAN MOTOR A1-1	18569	24.32
1092	SCAN MOTOR A1-2	19309	25.88
1094	FEEDHORN A1-1	19873	26.49
1096	FEEDHORN A1-2	20975	28.66
1098	RF MUX A1-1	20550	28.68
1100	RF MUX A1-2	21915	30.91
1102	LOCAL OSCILLATOR CHANNEL 3	22489	32.43
1104	LOCAL OSCILLATOR CHANNEL 4	23316	33.04
1106	LOCAL OSCILLATOR CHANNEL 5	22387	32.16
1108	LOCAL OSCILLATOR CHANNEL 6	21092	29.09
1110	LOCAL OSCILLATOR CHANNEL 7	21387	29.62
1112	LOCAL OSCILLATOR CHANNEL 8	22638	32.21
1114	LOCAL OSCILLATOR CHANNEL 15	22236	31.74
1116	PLL LO #2 CHANNELS 9 THROUGH 14	20553	28.30
1118	PLL LO #1 CHANNELS 9 THROUGH 14	23817	34.72
1120	SPARE (NOT USED)	32767	52.55
1122	MIXER/IF AMPLIFIER CHANNEL 3	21951	31.27
1124	MIXER/IF AMPLIFIER CHANNEL 4	22183	31.40
1126	MIXER/IF AMPLIFIER CHANNEL 5	21841	31.29
1128	MIXER/IF AMPLIFIER CHANNEL 6	21071	29.20
1130	MIXER/IF AMPLIFIER CHANNEL 7	21257	29.65
1132	MIXER/IF AMPLIFIER CHANNEL 8	22157	31.46
1134	MIXER/IF AMPLIFIER CH 9 THRU 14	20720	28.61
1136	MIXER/IF AMPLIFIER CHANNEL 15	21828	30.90
1138	IF AMPLIFIER CHANNEL 11 THRU 14	21911	30.97
1140	IF AMPLIFIER CHANNEL 9	22202	31.10
1142	IF AMPLIFIER CHANNEL 10	22028	31.17
1144	IF AMPLIFIER CHANNEL 11	21143	28.86
1146	DC/DC CONVERTER	23437	33.54
1148	IF AMPLIFIER CHANNEL 13	20855	28.90
1150	IF AMPLIFIER CHANNEL 14	21022	28.88
1152	IF AMPLIFIER CHANNEL 12	20471	28.95
1154	RF SHELF A1-1	21416	29.62
1156	RF SHELF A1-2	22068	30.85
1158	DETECTOR/PREAMPLIFIER ASSEMBLY	20007	26.99
1160	A1-1 WARM LOAD 1	23681	24.56
1162	A1-1 WARM LOAD 2	23714	24.56
1164	A1-1 WARM LOAD 3	23773	24.61
1166	A1-1 WARM LOAD 4	23639	24.65
1168	A1-1 WARM LOAD CENTER	24058	24.56
1170	A1-2 WARM LOAD 1	24678	26.64
1172	A1-2 WARM LOAD 2	24812	26.58
1174	A1-2 WARM LOAD 3	24700	26.63
1176	A1-2 WARM LOAD 4	24540	26.63
1178	A1-2 WARM LOAD CENTER	24973	26.63
1180	TEMP SENSOR REFERENCE VOLTAGE	25046	

COLD CAL MODE

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER A1-1 POWER	ON	ON	ON
SCANNER A1-2 POWER	ON	ON	ON
PLL POWER	PLLO # 1	PLLO # 1	PLLO # 1
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	YES	YES	YES
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	215	19.4	215	19.4	215	19.4
A1-2 SCANNER MOTOR TEMPERATURE	217	22.1	217	22.1	217	22.1
A1-1 RF SHELF TEMPERATURE	216	20.7	216	20.7	217	22.1
A1-2 RF SHELF TEMPERATURE	220	26.2	220	26.2	220	26.2
A1-1 WARM LOAD TEMPERATURE	215	19.4	215	19.4	215	19.4
A1-2 WARM LOAD TEMPERATURE	217	22.1	217	22.1	217	22.1

DESCRIPTION	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG)	3	1.40	3	1.40	3	1.40
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG)	2	0.93	2	0.93	2	0.93
SIGNAL PROCESSING +15 VDC	169	14.58	169	14.58	169	14.58
ANTENNA DRIVE +15 VDC	169	14.58	169	14.58	169	14.58
SIGNAL PROCESSING -15 VDC	149	-15.10	149	-15.10	149	-15.10
ANTENNA DRIVE -15 VDC	147	-15.20	147	-15.20	147	-15.20
RECEIVER AMPLIFIER +8 VDC	156	7.80	156	7.80	156	7.80
SIGNAL PROCESSOR +5 VDC	145	4.83	145	4.83	145	4.83
ANTENNA DRIVE +5 VDC	145	4.83	145	4.83	145	4.83
RECEIVER MIXER/IF +10 VDC	168	9.71	168	9.71	168	9.71
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC	168	14.50	168	14.50	168	14.50
PHASE LOCK LOOP (CHANNEL 9/14) -15 VDC	143	-15.40	143	-15.40	143	-15.40
L.O. VOLTAGE (CHANNEL 8) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 7) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 6) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 3) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 4) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 5) VDC	171	9.78	171	9.78	171	9.78
PLLO # 2 LOCK DETECT	2	0.04	2	0.04	2	0.04
PLLO # 1 LOCK DETECT	218	4.36	218	4.36	218	4.36
L.O. VOLTAGE (CHANNEL 15) VDC	170	14.67	170	14.67	170	14.67

COLD CAL MODE

PRT TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
VARIABLE TARGET	615	42.00	601	14.00
	616	43.00	602	15.00
	617	44.00	603	16.00
	618	45.00	604	17.00
	619	46.00	605	18.00
	620	47.00	606	19.00
	621	48.00	607	20.00
FIXED TARGET	622	49.00	608	21.00
	623	50.00	609	22.00
	624	51.00	610	23.00
	625	52.00	611	24.00
	626	53.00	612	25.00
	627	67.00	613	69.00
	628	68.00	614	70.00
	629	71.00	630	72.00
BASEPLATE	631	26.00	632	27.00

THERMOCOUPLE TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
FIXED TARGET SHROUD	558	5.00	537	34.00
	559	6.00	538	35.00
VARIABLE TARGET SHROUD	550	7.00	524	36.00
	551	8.00	525	37.00
FIXED TARGET N2	506	57.00	502	30.00
	507	58.00	503	31.00
VARIABLE TARGET N2	516	59.00	511	32.00
	517	60.00	512	33.00
HEATER N2	514	1.00	509	38.00
	515	2.00	510	39.00
FIXED TARGET FLOW METER	508	63.00	504	61.00
VARIABLE TARGET FLOW METER	518	64.00	513	62.00
BASEPLATE HEATER N2	519	3.00	520	4.00
BASEPLATE N2	521	9.00	522	10.00
BASEPLATE FLOW METER	523	65.00		
ADJUNCT RADIATORS	575	73.00	577	74.00
	579	75.00	581	76.00

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)

BP	A1-1 Reflector			
	Para No.	Position*	Required**	Pass/Fail
CC	3.2.4.3.4.3, Step 4			
	a.	6124	6131	PASS
	b.	6054	6055	
	c.	5979	5979	
	d.	5828	5828	

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 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Haig 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

3-3-00
Quality Control Date

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:41:59 SCAN NUMBER 294

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	6124	6124	9	6124	6124	17	6124	6124	25	6124	6124
2	6124	6124	10	6123	6123	18	6124	6124	26	6124	6124
3	6124	6124	11	6124	6123	19	6123	6123	27	6123	6123
4	6124	6124	12	6124	6124	20	6124	6124	28	6124	6124
5	6123	6123	13	6124	6124	21	6124	6124	29	6124	6124
6	6124	6123	14	6124	6124	22	6123	6123	30	6124	6124
7	6124	6124	15	6123	6123	23	6124	6124	CC	0	0
8	6124	6124	16	6124	6124	24	6124	6124	WC	0	0

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 28

a.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:43:27 SCAN NUMBER 305

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	6054	6054	9	6054	6054	17	6054	6054	25	6054	6054
2	6054	6054	10	6054	6054	18	6054	6054	26	6054	6054
3	6055	6054	11	6054	6054	19	6054	6054	27	6054	6054
4	6054	6055	12	6054	6054	20	6054	6054	28	6055	6054
5	6054	6054	13	6054	6054	21	6054	6054	29	6054	6054
6	6054	6055	14	6054	6054	22	6054	6054	30	6054	6054
7	6054	6054	15	6055	6054	23	6055	6054	CC	0	0
8	6054	6055	16	6054	6055	24	6054	6055	WC	0	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 28

b.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:45:43 SCAN NUMBER 322

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5979	5979	9	5979	5979	17	5979	5980	25	5979	5979
2	5980	5979	10	5980	5979	18	5979	5979	26	5979	5979
3	5979	5980	11	5979	5979	19	5979	5979	27	5980	5979
4	5979	5979	12	5979	5979	20	5979	5980	28	5979	5979
5	5980	5979	13	5980	5979	21	5979	5979	29	5979	5980
6	5979	5980	14	5979	5979	22	5979	5979	30	5980	5979
7	5979	5979	15	5979	5979	23	5979	5980	CC	0	0
8	5979	5979	16	5980	5979	24	5979	5979	WC	0	0

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 28

C.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:51:02 SCAN NUMBER 362

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 1

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5828	5829	9	5828	5828	17	5829	5828	25	5828	5828
2	5828	5829	10	5828	5828	18	5829	5828	26	5828	5829
3	5828	5829	11	5828	5828	19	5829	5828	27	5828	5829
4	5828	5829	12	5828	5828	20	5828	5828	28	5828	5828
5	5828	5829	13	5828	5828	21	5828	5828	29	5828	5828
6	5828	5829	14	5828	5828	22	5828	5828	30	5828	5828
7	5828	5828	15	5829	5828	23	5828	5828	CC	0	0
8	5828	5828	16	5829	5828	24	5828	5828	WC	0	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS28

d.

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)

BP	A1-2 Reflector			
	Para No.	Position*	Required**	Pass/Fail
CC	3.2.4.3.4.3, Step 4			
	a.	5885	5889	PASS
	b.	5820	5813	
	c.	5741	5737	
	d.	5589	5586	

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 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 379237 S/N: 108

R. [signature] 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

[signature] QA 194 3-3-00
Quality Control Date

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:42:09 SCAN NUMBER 295

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5884	5885	9	5885	5885	17	5885	5884	25	5885	5884
2	5885	5885	10	5885	5885	18	5884	5885	26	5884	5885
3	5884	5885	11	5885	5885	19	5885	5885	27	5885	5884
4	5885	5885	12	5884	5885	20	5884	5885	28	5885	5885
5	5884	5885	13	5885	5885	21	5885	5884	29	5885	5885
6	5885	5884	14	5884	5885	22	5885	5885	30	5885	5885
7	5885	5885	15	5885	5884	23	5885	5884	CC	0	0
8	5885	5885	16	5884	5885	24	5884	5885	WC	0	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 28

a.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:43:42 SCAN NUMBER 307

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5820	5820	9	5820	5820	17	5820	5820	25	5820	5820
2	5820	5820	10	5820	5820	18	5820	5820	26	5820	5820
3	5820	5820	11	5820	5820	19	5820	5820	27	5820	5820
4	5820	5820	12	5820	5820	20	5820	5820	28	5820	5820
5	5820	5820	13	5820	5820	21	5820	5820	29	5820	5820
6	5820	5820	14	5820	5820	22	5820	5820	30	5820	5820
7	5820	5820	15	5820	5820	23	5820	5820	CC	0	0
8	5820	5820	16	5820	5820	24	5820	5820	WC	0	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS28

b.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:45:53 SCAN NUMBER 323

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5741	5741	9	5741	5741	17	5741	5741	25	5741	5741
2	5741	5741	10	5741	5741	18	5741	5741	26	5741	5741
3	5741	5741	11	5741	5741	19	5741	5741	27	5741	5741
4	5741	5741	12	5741	5741	20	5741	5741	28	5741	5741
5	5741	5741	13	5741	5741	21	5741	5741	29	5741	5741
6	5741	5741	14	5741	5741	22	5741	5741	30	5741	5741
7	5741	5741	15	5741	5741	23	5741	5741	CC	0	0
8	5741	5741	16	5741	5741	24	5741	5741	WC	0	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TPS28

C.

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:50:46 SCAN NUMBER 360

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS 2

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5589	5589	9	5589	5589	17	5589	5589	25	5589	5589
2	5589	5589	10	5589	5589	18	5589	5589	26	5589	5589
3	5589	5589	11	5589	5589	19	5589	5589	27	5589	5589
4	5589	5589	12	5589	5589	20	5589	5589	28	5589	5589
5	5589	5589	13	5589	5589	21	5589	5589	29	5589	5589
6	5589	5589	14	5589	5589	22	5589	5589	30	5589	5589
7	5589	5589	15	5589	5589	23	5589	5589	CC	0	0
8	5589	5589	16	5589	5589	24	5589	5589	WC	0	0

[21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS28

d.

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

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail PASS	Element (For Ref)	Measured*	Required**	Pass/Fail PASS
01	0018	16011	16,500±4000		0030	15962	16,500±4000	
02	0052	16004			0064	15956		
03	0086	15999			0098	15958		
04	0120	16006			0132	15955		
05	0154	16006			0166	15959		
06	0188	16005			0200	15960		
07	0222	16003			0234	15958		
08	0256	15997			0268	15957		
09	0290	16005			0302	15959		
10	0324	16003			0336	15960		
11	0356	16002			0370	15959		
12	0392	15999			0404	15956		
13	0426	16007			0438	15962		
14	0460	16007			0472	15955		
15	0494	16008			0506	15959		
16	0528	15998			0540	15954		
17	0562	16003			0574	15958		
18	0596	16001			0608	15959		
19	0630	16002			0642	15961		
20	0664	15999			0676	15955		
21	0698	15997			0710	15959		
22	0732	16004			0744	15956		
23	0766	16003			0778	15958		
24	0800	16600			0812	15959		
25	0834	15999			0846	15954		
26	0868	16003			0880	15957		
27	0902	15999			0914	15958		
28	0936	16007			0948	15956		
29	0970	16006			0982	15960		
30	1004	16064	16,500±4000		1016	15959	16,500±4000	
CC	1038	0	0		1050	0	0	
WC	1190	0	0		1202	0	0	

* 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: 373237 S/N: 108

R. Haigh 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

Quality Control 7A 194 3-3-00
Date

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:37:05 SCAN NUMBER 257

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 3

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16011	9	16005	17	16003	25	15999
2	16004	10	16003	18	16001	26	16003
3	15999	11	16002	19	16002	27	15999
4	16006	12	15999	20	15999	28	16007
5	16006	13	16007	21	15997	29	16006
6	16005	14	16007	22	16004	30	16004
7	16003	15	16008	23	16003	CC	0
8	15997	16	15998	24	16000	WC	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS29

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:37:25 SCAN NUMBER 260

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA

CHANNEL 9

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	15962	9	15959	17	15958	25	15954
2	15956	10	15960	18	15959	26	15957
3	15958	11	15959	19	15961	27	15958
4	15955	12	15956	20	15955	28	.15956
5	15959	13	15962	21	15959	29	.15960
6	15960	14	15955	22	15956	30	.15959
7	15958	15	15959	23	15958	CC	0
8	15957	16	15954	24	15959	WC	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS29

TEST DATA SHEET 30 (Sheet 1 of 2)
Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1	24.56	25 ± 15	PASS
1092	A1-1 Warm Load 2	24.57	25 ± 15	
1094	A1-1 Warm Load 3	24.62	25 ± 15	
1096	A1-1 Warm Load 4	24.66	25 ± 15	
1098	A1-1 Warm Load Center	24.57	25 ± 15	
1100	A1-2 Warm Load 1	26.66	25 ± 15	
1102	A1-2 Warm Load 2	26.59	25 ± 15	
1104	A1-2 Warm Load 3	26.64	25 ± 15	
1106	A1-2 Warm Load 4	26.63	25 ± 15	
1108	A1-2 Warm Load Center	26.64	25 ± 15	
1110	Local Oscillator Channel 7	29.71	25 ± 15	
1112	Local Oscillator Channel 8	32.33	25 ± 15	
1114	Local Oscillator Channel 15	31.86	25 ± 15	
1116	PLL LO #2 Channels 9-14	28.40	25 ± 15	
1118	PLL LO #1 Channels 9-14	34.85	25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***	N/A AMSU 6 SEIT		
1122	Mixer I.F. Amp. Channel 3	31.40	25 ± 15	
1124	Mixer I.F. Amp. Channel 4	31.54	25 ± 15	
1126	Mixer I.F. Amp. Channel 5	31.42	25 ± 15	
1128	Mixer I.F. Amp. Channel 6	29.29	25 ± 15	
1130	Mixer I.F. Amp. Channel 7	29.75	25 ± 15	
1132	Mixer I.F. Amp. Channel 8	31.59	25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14	28.70	25 ± 15	
1136	Mixer I.F. Amp. Channel 15	31.00	25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14	31.09	25 ± 15	PASS
1140	I.F. Amp. Channel 9	31.23	25 ± 15	
1142	I.F. Amp. Channel 10	31.30	25 ± 15	
1144	I.F. Amp. Channel 11	28.95	25 ± 15	
1146	DC/DC Converter	33.66	25 ± 15	
1148	I.F. Amp. Channel 13	28.99	25 ± 15	
1150	I.F. Amp. Channel 14	28.96	25 ± 15	
1152	I.F. Amp. Channel 12	29.04	25 ± 15	
1154	RF Shelf A1-1	29.75	25 ± 15	
1156	RF Shelf A1-2	31.00	25 ± 15	
1158	Detector Preamp Assy.	27.06	25 ± 15	
1160	Scan Motor A1-1	24.30	25 ± 15	
1162	Scan Motor A1-2	25.89	25 ± 15	
1164	Feed Horn A1-1	26.54	25 ± 15	
1166	Feed Horn A1-2	28.74	25 ± 15	
1168	R.F. Mux A1-1	28.77	25 ± 15	
1170	R.F. Mux A1-2	31.03	25 ± 15	
1172	Local Oscillator Channel 3	32.56	25 ± 15	
1174	Local Oscillator Channel 4	33.16	25 ± 15	
1176	Local Oscillator Channel 5	32.28	25 ± 15	
1178	Local Oscillator Channel 6	29.15	25 ± 15	
1180	Temp Sensor Ref Voltage Count	25045	**	

* 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: 373237 S/N: 108

R. Haig 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00
Quality Control Date

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:37:49 SCAN NUMBER 263

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 1 TO 16

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR A1-1	18557	24.30	9	LO CHANNEL 5	22447	32.28
2	SCAN MOTOR A1-2	19314	25.89	10	LO CHANNEL 6	21124	29.15
3	FEEDHORN A1-1	19901	26.54	11	LO CHANNEL 7	21432	29.71
4	FEEDHORN A1-2	21019	28.74	12	LO CHANNEL 8	22700	32.33
5	RF MUX A1-1	20596	28.77	13	LO CHANNEL 15	22295	31.86
6	RF MUX A1-2	21978	31.03	14	PLLO #2 CH 9/14	20604	28.40
7	LO CHANNEL 3	22551	32.56	15	PLLO #1 CH 9/14	23885	34.85
8	LO CHANNEL 4	23378	33.16	16	PLLO REFERENCE	32767	52.55

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS30

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:37:57 SCAN NUMBER 264

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 17 TO 32

NO		DATA	TEMP C	NO		DATA	TEMP C
17	MIXER IF CH 3	22018	31.40	25	IF AMP CH 11/14	21973	31.09
18	MIXER IF CH 4	22253	31.54	26	IF AMP CH 9	22268	31.23
19	MIXER IF CH 5	21908	31.42	27	IF AMP CH 10	22093	31.30
20	MIXER IF CH 6	21121	29.29	28	IF AMP CH 11	21189	28.95
21	MIXER IF CH 7	21312	29.75	29	DC/DC CONVERTER	23500	33.66
22	MIXER IF CH 8	22224	31.59	30	IF AMP CH 13	20902	28.99
23	MIXER IF CH 9/14	20768	28.70	31	IF AMP CH 14	21067	28.96
24	MIXER IF CH 15	21887	31.00	32	IF AMP CH 12	20516	29.04

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 30

AMSU A1-29 A1.EXE COLD CAL MODE P1 3-MAR-00 03:38:13 SCAN NUMBER 266
[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 31 TO 46

NO	DATA	TEMP C	NO	DATA	TEMP C
31 IF AMP CH 14	21074	28.98	39 A1-1 WARM LOAD 4	23641	24.66
32 IF AMP CH 12	20525	29.05	40 A1-1 WARM LOAD C	24060	24.57
33 RF SHELF A1-1	21484	29.75	41 A1-2 WARM LOAD 1	24684	26.66
34 RF SHELF A1-2	22145	31.00	42 A1-2 WARM LOAD 2	24817	26.59
35 DETECTOR/PREAMP	20045	27.06	43 A1-2 WARM LOAD 3	24704	26.64
36 A1-1 WARM LOAD 1	23681	24.56	44 A1-2 WARM LOAD 4	24544	26.63
37 A1-1 WARM LOAD 2	23717	24.57	45 A1-2 WARM LOAD C	24977	26.64
38 A1-1 WARM LOAD 3	23774	24.62	THERMAL REFERENCE	25045	

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN
SELECT TOUCHSCREEN BUTTON 2

TDS30

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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	P
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	29	*	
[III]	0005	Digital-B Data Byte 1	16	16	
	0006	Digital-B Data Byte 2	14	14	
	0007	Digital-B Data Byte 3	0	0	
	0008	Digital-B Data Byte 4	0	0	

* AMSU A1 Identification Words (data entered in decimal system)	Binary	Decimal
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: 373237 S/N: 108

R. Haid 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00
Quality Control Date

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:53:11 SCAN NUMBER 378

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

COMMANDS

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POSIT = NO	[15]
[10]	SURVIVAL HEATER POWER =	OFF	ANTENNA IN NADIR POSITION = YES	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA IN FULL SCAN MODE = NO	[17]
[12]	SCANNER A1 - 1 POWER =	ON	PLL POWER = PLLO # 1	[18]
[13]	SCANNER A1 - 2 POWER =	ON	COLD CAL POSITION MSB = ZERO	[19]
[14]	ANTENNA IN WARM CAL POSIT =	NO	COLD CAL POSITION LSB = ZERO	[20]

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 3

TDS 31

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	572	NADIR SAMPLE 17 CH 8	15702
2	SYNC SEQUENCE BYTE 2	11111111	574	CH 9	15940
3	SYNC SEQUENCE BYTE 3	11111111	576	CH 10	17084
4	UNIT ID AND SERIAL NO	00011101	578	CH 11	18948
5	DIGITAL B DATA BYTE 1	00010000	580	CH 12	19180
6	DIGITAL B DATA BYTE 2	00001110	582	CH 13	17938
7	DIGITAL B DATA BYTE 3	00000000	584	CH 14	19043
8	DIGITAL B DATA BYTE 4	00000000	586	CH 15	16581
10	REFLECTOR 1 POSITION 1	2261	588	REFLECTOR 1 POSITION 18	2261
12	REFLECTOR 2 POSITION 1	2020	590	REFLECTOR 2 POSITION 18	2020
14	REFL 1 POS 1 2ND LOOK	2261	592	REFL 1 POS 18 2ND LOOK	2261
16	REFL 2 POS 1 2ND LOOK	2020	594	REFL 2 POS 18 2ND LOOK	2020
18	NADIR SAMPLE 1 CH 3	15931	596	NADIR SAMPLE 18 CH 3	15933
20	CH 4	16918	598	CH 4	16914
22	CH 5	15335	600	CH 5	15335
24	CH 6	16396	602	CH 6	16395
26	CH 7	16463	604	CH 7	16465
28	CH 8	15705	606	CH 8	15701
30	CH 9	15938	608	CH 9	15941
32	CH 10	17093	610	CH 10	17091
34	CH 11	18942	612	CH 11	18942
36	CH 12	19183	614	CH 12	19180
38	CH 13	17946	616	CH 13	17938
40	CH 14	19058	618	CH 14	19043
42	CH 15	16581	620	CH 15	16580
44	REFLECTOR 1 POSITION 2	2261	622	REFLECTOR 1 POSITION 19	2261
46	REFLECTOR 2 POSITION 2	2020	624	REFLECTOR 2 POSITION 19	2020
48	REFL 1 POS 2 2ND LOOK	2261	626	REFL 1 POS 19 2ND LOOK	2261
50	REFL 2 POS 2 2ND LOOK	2020	628	REFL 2 POS 19 2ND LOOK	2020
52	NADIR SAMPLE 2 CH 3	15934	630	NADIR SAMPLE 19 CH 3	15933
54	CH 4	16923	632	CH 4	16913
56	CH 5	15338	634	CH 5	15336
58	CH 6	16396	636	CH 6	16396
60	CH 7	16463	638	CH 7	16465
62	CH 8	15702	640	CH 8	15703
64	CH 9	15939	642	CH 9	15938
66	CH 10	17089	644	CH 10	17092
68	CH 11	18947	646	CH 11	18948
70	CH 12	19180	648	CH 12	19179
72	CH 13	17949	650	CH 13	17946
74	CH 14	19043	652	CH 14	19049
76	CH 15	16579	654	CH 15	16581
78	REFLECTOR 1 POSITION 3	2261	656	REFLECTOR 1 POSITION 20	2261
80	REFLECTOR 2 POSITION 3	2020	658	REFLECTOR 2 POSITION 20	2020
82	REFL 1 POS 3 2ND LOOK	2260	660	REFL 1 POS 20 2ND LOOK	2261
84	REFL 2 POS 3 2ND LOOK	2020	662	REFL 2 POS 20 2ND LOOK	2020
86	NADIR SAMPLE 3 CH 3	15934	664	NADIR SAMPLE 20 CH 3	15934
88	CH 4	16919	666	CH 4	16918
90	CH 5	15338	668	CH 5	15340
92	CH 6	16397	670	CH 6	16398

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	CH 7	16465	672	CH 7	16467
96	CH 8	15703	674	CH 8	15703
98	CH 9	15939	676	CH 9	15940
100	CH 10	17085	678	CH 10	17090
102	CH 11	18937	680	CH 11	18950
104	CH 12	19177	682	CH 12	19185
106	CH 13	17954	684	CH 13	17946
108	CH 14	19053	686	CH 14	19056
110	CH 15	16580	688	CH 15	16582
112	REFLECTOR 1 POSITION 4	2260	690	REFLECTOR 1 POSITION 21	2260
114	REFLECTOR 2 POSITION 4	2020	692	REFLECTOR 2 POSITION 21	2020
116	REFL 1 POS 4 2ND LOOK	2260	694	REFL 1 POS 21 2ND LOOK	2260
118	REFL 2 POS 4 2ND LOOK	2020	696	REFL 2 POS 21 2ND LOOK	2020
120	NADIR SAMPLE 4 CH 3	15927	698	NADIR SAMPLE 21 CH 3	15934
122	CH 4	16917	700	CH 4	16918
124	CH 5	15337	702	CH 5	15338
126	CH 6	16397	704	CH 6	16397
128	CH 7	16467	706	CH 7	16465
130	CH 8	15701	708	CH 8	15703
132	CH 9	15940	710	CH 9	15947
134	CH 10	17091	712	CH 10	17082
136	CH 11	18949	714	CH 11	18945
138	CH 12	19178	716	CH 12	19182
140	CH 13	17938	718	CH 13	17944
142	CH 14	19042	720	CH 14	19081
144	CH 15	16581	722	CH 15	16580
146	REFLECTOR 1 POSITION 5	2261	724	REFLECTOR 1 POSITION 22	2261
148	REFLECTOR 2 POSITION 5	2020	726	REFLECTOR 2 POSITION 22	2020
150	REFL 1 POS 5 2ND LOOK	2261	728	REFL 1 POS 22 2ND LOOK	2261
152	REFL 2 POS 5 2ND LOOK	2020	730	REFL 2 POS 22 2ND LOOK	2020
154	NADIR SAMPLE 5 CH 3	15929	732	NADIR SAMPLE 22 CH 3	15935
156	CH 4	16922	734	CH 4	16916
158	CH 5	15334	736	CH 5	15333
160	CH 6	16399	738	CH 6	16398
162	CH 7	16463	740	CH 7	16466
164	CH 8	15702	742	CH 8	15701
166	CH 9	15938	744	CH 9	15943
168	CH 10	17093	746	CH 10	17090
170	CH 11	18949	748	CH 11	18949
172	CH 12	19189	750	CH 12	19180
174	CH 13	17944	752	CH 13	17947
176	CH 14	19064	754	CH 14	19071
178	CH 15	16579	756	CH 15	16579
180	REFLECTOR 1 POSITION 6	2261	758	REFLECTOR 1 POSITION 23	2261
182	REFLECTOR 2 POSITION 6	2020	760	REFLECTOR 2 POSITION 23	2020
184	REFL 1 POS 6 2ND LOOK	2261	762	REFL 1 POS 23 2ND LOOK	2261
186	REFL 2 POS 6 2ND LOOK	2020	764	REFL 2 POS 23 2ND LOOK	2020
188	NADIR SAMPLE 6 CH 3	15931	766	NADIR SAMPLE 23 CH 3	15933
190	CH 4	16919	768	CH 4	16917
192	CH 5	15340	770	CH 5	15337

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
194	CH 6	16396	772	CH 6	16397
196	CH 7	16465	774	CH 7	16466
198	CH 8	15702	776	CH 8	15703
200	CH 9	15940	778	CH 9	15942
202	CH 10	17088	780	CH 10	17085
204	CH 11	18951	782	CH 11	18951
206	CH 12	19178	784	CH 12	19182
208	CH 13	17957	786	CH 13	17938
210	CH 14	19055	788	CH 14	19042
212	CH 15	16581	790	CH 15	16580
214	REFLECTOR 1 POSITION 7	2261	792	REFLECTOR 1 POSITION 24	2261
216	REFLECTOR 2 POSITION 7	2020	794	REFLECTOR 2 POSITION 24	2020
218	REFL 1 POS 7 2ND LOOK	2261	796	REFL 1 POS 24 2ND LOOK	2261
220	REFL 2 POS 7 2ND LOOK	2020	798	REFL 2 POS 24 2ND LOOK	2020
222	NADIR SAMPLE 7 CH 3	15926	800	NADIR SAMPLE 24 CH 3	15929
224	CH 4	16919	802	CH 4	16918
226	CH 5	15336	804	CH 5	15338
228	CH 6	16396	806	CH 6	16399
230	CH 7	16464	808	CH 7	16464
232	CH 8	15704	810	CH 8	15705
234	CH 9	15938	812	CH 9	15943
236	CH 10	17095	814	CH 10	17094
238	CH 11	18951	816	CH 11	18949
240	CH 12	19182	818	CH 12	19186
242	CH 13	17947	820	CH 13	17957
244	CH 14	19060	822	CH 14	19061
246	CH 15	16581	824	CH 15	16581
248	REFLECTOR 1 POSITION 8	2261	826	REFLECTOR 1 POSITION 25	2261
250	REFLECTOR 2 POSITION 8	2020	828	REFLECTOR 2 POSITION 25	2020
252	REFL 1 POS 8 2ND LOOK	2261	830	REFL 1 POS 25 2ND LOOK	2261
254	REFL 2 POS 8 2ND LOOK	2020	832	REFL 2 POS 25 2ND LOOK	2020
256	NADIR SAMPLE 8 CH 3	15935	834	NADIR SAMPLE 25 CH 3	15936
258	CH 4	16917	836	CH 4	16916
260	CH 5	15334	838	CH 5	15337
262	CH 6	16396	840	CH 6	16397
264	CH 7	16466	842	CH 7	16468
266	CH 8	15705	844	CH 8	15705
268	CH 9	15939	846	CH 9	15940
270	CH 10	17089	848	CH 10	17087
272	CH 11	18948	850	CH 11	18950
274	CH 12	19186	852	CH 12	19173
276	CH 13	17955	854	CH 13	17944
278	CH 14	19063	856	CH 14	19039
280	CH 15	16580	858	CH 15	16580
282	REFLECTOR 1 POSITION 9	2261	860	REFLECTOR 1 POSITION 26	2260
284	REFLECTOR 2 POSITION 9	2020	862	REFLECTOR 2 POSITION 26	2020
286	REFL 1 POS 9 2ND LOOK	2261	864	REFL 1 POS 26 2ND LOOK	2260
288	REFL 2 POS 9 2ND LOOK	2020	866	REFL 2 POS 26 2ND LOOK	2020
290	NADIR SAMPLE 9 CH 3	15933	868	NADIR SAMPLE 26 CH 3	15935
292	CH 4	16918	870	CH 4	16917

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
294	CH 5	15333	872	CH 5	15336
296	CH 6	16399	874	CH 6	16397
298	CH 7	16464	876	CH 7	16468
300	CH 8	15703	878	CH 8	15701
302	CH 9	15939	880	CH 9	15942
304	CH 10	17087	882	CH 10	17089
306	CH 11	18954	884	CH 11	18945
308	CH 12	19175	886	CH 12	19183
310	CH 13	17955	888	CH 13	17949
312	CH 14	19064	890	CH 14	19058
314	CH 15	16580	892	CH 15	16580
316	REFLECTOR 1 POSITION 10	2261	894	REFLECTOR 1 POSITION 27	2261
318	REFLECTOR 2 POSITION 10	2020	896	REFLECTOR 2 POSITION 27	2020
320	REFL 1 POS 10 2ND LOOK	2260	898	REFL 1 POS 27 2ND LOOK	2261
322	REFL 2 POS 10 2ND LOOK	2020	900	REFL 2 POS 27 2ND LOOK	2020
324	NADIR SAMPLE 10 CH 3	15933	902	NADIR SAMPLE 27 CH 3	15933
326	CH 4	16920	904	CH 4	16915
328	CH 5	15339	906	CH 5	15340
330	CH 6	16395	908	CH 6	16399
332	CH 7	16464	910	CH 7	16466
334	CH 8	15706	912	CH 8	15701
336	CH 9	15941	914	CH 9	15941
338	CH 10	17090	916	CH 10	17088
340	CH 11	18943	918	CH 11	18948
342	CH 12	19189	920	CH 12	19184
344	CH 13	17942	922	CH 13	17952
346	CH 14	19047	924	CH 14	19072
348	CH 15	16581	926	CH 15	16581
350	REFLECTOR 1 POSITION 11	2261	928	REFLECTOR 1 POSITION 28	2261
352	REFLECTOR 2 POSITION 11	2020	930	REFLECTOR 2 POSITION 28	2020
354	REFL 1 POS 11 2ND LOOK	2261	932	REFL 1 POS 28 2ND LOOK	2261
356	REFL 2 POS 11 2ND LOOK	2020	934	REFL 2 POS 28 2ND LOOK	2020
358	NADIR SAMPLE 11 CH 3	15929	936	NADIR SAMPLE 28 CH 3	15934
360	CH 4	16919	938	CH 4	16916
362	CH 5	15337	940	CH 5	15334
364	CH 6	16396	942	CH 6	16398
366	CH 7	16468	944	CH 7	16466
368	CH 8	15704	946	CH 8	15701
370	CH 9	15942	948	CH 9	15939
372	CH 10	17090	950	CH 10	17094
374	CH 11	18946	952	CH 11	18951
376	CH 12	19184	954	CH 12	19187
378	CH 13	17934	956	CH 13	17952
380	CH 14	19051	958	CH 14	19059
382	CH 15	16580	960	CH 15	16580
384	REFLECTOR 1 POSITION 12	2261	962	REFLECTOR 1 POSITION 29	2261
386	REFLECTOR 2 POSITION 12	2020	964	REFLECTOR 2 POSITION 29	2020
388	REFL 1 POS 12 2ND LOOK	2261	966	REFL 1 POS 29 2ND LOOK	2261
390	REFL 2 POS 12 2ND LOOK	2020	968	REFL 2 POS 29 2ND LOOK	2020
392	NADIR SAMPLE 12 CH 3	15933	970	NADIR SAMPLE 29 CH 3	15934

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
394	CH 4	16919	972	CH 4	16919
396	CH 5	15338	974	CH 5	15335
398	CH 6	16401	976	CH 6	16398
400	CH 7	16467	978	CH 7	16464
402	CH 8	15696	980	CH 8	15700
404	CH 9	15940	982	CH 9	15938
406	CH 10	17090	984	CH 10	17090
408	CH 11	18948	986	CH 11	18951
410	CH 12	19190	988	CH 12	19177
412	CH 13	17952	990	CH 13	17954
414	CH 14	19057	992	CH 14	19065
416	CH 15	16581	994	CH 15	16580
418	REFLECTOR 1 POSITION 13	2261	996	REFLECTOR 1 POSITION 30	2261
420	REFLECTOR 2 POSITION 13	2020	998	REFLECTOR 2 POSITION 30	2020
422	REFL 1 POS 13 2ND LOOK	2261	1000	REFL 1 POS 30 2ND LOOK	2261
424	REFL 2 POS 13 2ND LOOK	2020	1002	REFL 2 POS 30 2ND LOOK	2020
426	NADIR SAMPLE 13 CH 3	15926	1004	NADIR SAMPLE 30 CH 3	15932
428	CH 4	16919	1006	CH 4	16915
430	CH 5	15335	1008	CH 5	15336
432	CH 6	16396	1010	CH 6	16398
434	CH 7	16465	1012	CH 7	16470
436	CH 8	15702	1014	CH 8	15701
438	CH 9	15939	1016	CH 9	15941
440	CH 10	17086	1018	CH 10	17093
442	CH 11	18949	1020	CH 11	18952
444	CH 12	19188	1022	CH 12	19180
446	CH 13	17945	1024	CH 13	17952
448	CH 14	19065	1026	CH 14	19042
450	CH 15	16580	1028	CH 15	16579
452	REFLECTOR 1 POSITION 14	2261	1030	REFLECTOR 1 COLD CAL POS	0E
454	REFLECTOR 2 POSITION 14	2020	1032	REFLECTOR 2 COLD CAL POS	0E
456	REFL 1 POS 14 2ND LOOK	2261	1034	REFL 1 COLD CAL 2ND LOOK	0E
458	REFL 2 POS 14 2ND LOOK	2020	1036	REFL 2 COLD CAL 2ND LOOK	0E
460	NADIR SAMPLE 14 CH 3	15937	1038	COLD CAL DATA 1 CH 3	0
462	CH 4	16920	1040	CH 4	0
464	CH 5	15335	1042	CH 5	0
466	CH 6	16397	1044	CH 6	0
468	CH 7	16464	1046	CH 7	0
470	CH 8	15703	1048	CH 8	0
472	CH 9	15942	1050	CH 9	0
474	CH 10	17089	1052	CH 10	0
476	CH 11	18954	1054	CH 11	0
478	CH 12	19194	1056	CH 12	0
480	CH 13	17941	1058	CH 13	0
482	CH 14	19073	1060	CH 14	0
484	CH 15	16582	1062	CH 15	0
486	REFLECTOR 1 POSITION 15	2261	1064	COLD CAL DATA 2 CH 3	0
488	REFLECTOR 2 POSITION 15	2020	1066	CH 4	0
490	REFL 1 POS 15 2ND LOOK	2261	1068	CH 5	0
492	REFL 2 POS 15 2ND LOOK	2020	1070	CH 6	0

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
494	NADIR SAMPLE 15 CH 3	15934	1072	CH 7	0
496	CH 4	16915	1074	CH 8	0
498	CH 5	15335	1076	CH 9	0
500	CH 6	16399	1078	CH 10	0
502	CH 7	16467	1080	CH 11	0
504	CH 8	15704	1082	CH 12	0
506	CH 9	15938	1084	CH 13	0
508	CH 10	17088	1086	CH 14	0
510	CH 11	18949	1088	CH 15	0
512	CH 12	19188	1182	REFLECTOR 1 WARM CAL POS	0E
514	CH 13	17944	1184	REFLECTOR 2 WARM CAL POS	0E
516	CH 14	19056	1186	REFL 1 WARM CAL 2ND LOOK	0E
518	CH 15	16579	1188	REFL 2 WARM CAL 2ND LOOK	0E
520	REFLECTOR 1 POSITION 16	2260	1190	WARM CAL DATA 1 CH 3	0
522	REFLECTOR 2 POSITION 16	2020	1192	CH 4	0
524	REFL 1 POS 16 2ND LOOK	2260	1194	CH 5	0
526	REFL 2 POS 16 2ND LOOK	2020	1196	CH 6	0
528	NADIR SAMPLE 16 CH 3	15935	1198	CH 7	0
530	CH 4	16917	1200	CH 8	0
532	CH 5	15337	1202	CH 9	0
534	CH 6	16399	1204	CH 10	0
536	CH 7	16465	1206	CH 11	0
538	CH 8	15703	1208	CH 12	0
540	CH 9	15941	1210	CH 13	0
542	CH 10	17087	1212	CH 14	0
544	CH 11	18945	1214	CH 15	0
546	CH 12	19184	1216	WARM CAL DATA 2 CH 3	0
548	CH 13	17955	1218	CH 4	0
550	CH 14	19060	1220	CH 5	0
552	CH 15	16581	1222	CH 6	0
554	REFLECTOR 1 POSITION 17	2261	1224	CH 7	0
556	REFLECTOR 2 POSITION 17	2020	1226	CH 8	0
558	REFL 1 POS 17 2ND LOOK	2261	1228	CH 9	0
560	REFL 2 POS 17 2ND LOOK	2020	1230	CH 10	0
562	NADIR SAMPLE 17 CH 3	15931	1232	CH 11	0
564	CH 4	16916	1234	CH 12	0
566	CH 5	15339	1236	CH 13	0
568	CH 6	16398	1238	CH 14	0
570	CH 7	16464	1240	CH 15	0

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
1090	SCAN MOTOR A1-1	18583	24.35
1092	SCAN MOTOR A1-2	19414	26.08
1094	FEEDHORN A1-1	20171	27.06
1096	FEEDHORN A1-2	21455	29.58
1098	RF MUX A1-1	21022	29.59
1100	RF MUX A1-2	22572	32.18
1102	LOCAL OSCILLATOR CHANNEL 3	23131	33.75
1104	LOCAL OSCILLATOR CHANNEL 4	23959	34.30
1106	LOCAL OSCILLATOR CHANNEL 5	23026	33.40
1108	LOCAL OSCILLATOR CHANNEL 6	21431	29.75
1110	LOCAL OSCILLATOR CHANNEL 7	21870	30.56
1112	LOCAL OSCILLATOR CHANNEL 8	23251	33.40
1114	LOCAL OSCILLATOR CHANNEL 15	22805	32.85
1116	PLL LO #2 CHANNELS 9 THROUGH 14	21085	29.33
1118	PLL LO #1 CHANNELS 9 THROUGH 14	24470	36.00
1120	SPARE (NOT USED)	32767	52.55
1122	MIXER/IF AMPLIFIER CHANNEL 3	22616	32.56
1124	MIXER/IF AMPLIFIER CHANNEL 4	22846	32.69
1126	MIXER/IF AMPLIFIER CHANNEL 5	22514	32.60
1128	MIXER/IF AMPLIFIER CHANNEL 6	21542	30.11
1130	MIXER/IF AMPLIFIER CHANNEL 7	21775	30.65
1132	MIXER/IF AMPLIFIER CHANNEL 8	22816	32.74
1134	MIXER/IF AMPLIFIER CH 9 THRU 14	21191	29.52
1136	MIXER/IF AMPLIFIER CHANNEL 15	22372	31.87
1138	IF AMPLIFIER CHANNEL 11 THRU 14	22489	32.10
1140	IF AMPLIFIER CHANNEL 9	22789	32.24
1142	IF AMPLIFIER CHANNEL 10	22613	32.31
1144	IF AMPLIFIER CHANNEL 11	21604	29.76
1146	DC/DC CONVERTER	24033	34.71
1148	IF AMPLIFIER CHANNEL 13	21312	29.78
1150	IF AMPLIFIER CHANNEL 14	21480	29.76
1152	IF AMPLIFIER CHANNEL 12	20931	29.84
1154	RF SHELF A1-1	21952	30.66
1156	RF SHELF A1-2	22708	32.09
1158	DETECTOR/PREAMPLIFIER ASSEMBLY	20316	27.58
1160	A1-1 WARM LOAD 1	23704	24.61
1162	A1-1 WARM LOAD 2	23745	24.62
1164	A1-1 WARM LOAD 3	23800	24.67
1166	A1-1 WARM LOAD 4	23663	24.70
1168	A1-1 WARM LOAD CENTER	24082	24.61
1170	A1-2 WARM LOAD 1	24755	26.80
1172	A1-2 WARM LOAD 2	24883	26.72
1174	A1-2 WARM LOAD 3	24773	26.77
1176	A1-2 WARM LOAD 4	24616	26.78
1178	A1-2 WARM LOAD CENTER	25043	26.77
1180	TEMP SENSOR REFERENCE VOLTAGE	25046	

NADIR MODE

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER A1-1 POWER	ON	ON	ON
SCANNER A1-2 POWER	ON	ON	ON
PLL POWER	PLLO # 1	PLLO # 1	PLLO # 1
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	YES	YES	YES
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	215	19.4	215	19.4	215	19.4
A1-2 SCANNER MOTOR TEMPERATURE	217	22.1	217	22.1	217	22.1
A1-1 RF SHELF TEMPERATURE	217	22.1	217	22.1	217	22.1
A1-2 RF SHELF TEMPERATURE	221	27.5	221	27.5	221	27.5
A1-1 WARM LOAD TEMPERATURE	215	19.4	215	19.4	215	19.4
A1-2 WARM LOAD TEMPERATURE	217	22.1	217	22.1	217	22.1

DESCRIPTION	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG)	3	1.40	3	1.40	2	0.93
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG)	2	0.93	2	0.93	2	0.93
SIGNAL PROCESSING +15 VDC	170	14.67	170	14.67	170	14.67
ANTENNA DRIVE +15 VDC	169	14.58	169	14.58	169	14.58
SIGNAL PROCESSING -15 VDC	149	-15.10	148	-15.15	149	-15.10
ANTENNA DRIVE -15 VDC	147	-15.20	147	-15.20	147	-15.20
RECEIVER AMPLIFIER +8 VDC	156	7.80	156	7.80	156	7.80
SIGNAL PROCESSOR +5 VDC	145	4.83	145	4.83	145	4.83
ANTENNA DRIVE +5 VDC	145	4.83	145	4.83	145	4.83
RECEIVER MIXER/IF +10 VDC	169	9.76	169	9.76	169	9.76
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC	168	14.50	168	14.50	168	14.50
PHASE LOCK LOOP (CHANNEL 9/14) -15 VDC	143	-15.40	143	-15.40	143	-15.40
L.O. VOLTAGE (CHANNEL 8) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 7) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 6) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 3) VDC	172	9.84	172	9.84	172	9.84
L.O. VOLTAGE (CHANNEL 4) VDC	171	9.78	170	9.73	171	9.78
L.O. VOLTAGE (CHANNEL 5) VDC	171	9.78	171	9.78	171	9.78
PLLO # 2 LOCK DETECT	2	0.04	2	0.04	2	0.04
PLLO # 1 LOCK DETECT	218	4.36	218	4.36	218	4.36
L.O. VOLTAGE (CHANNEL 15) VDC	170	14.67	170	14.67	170	14.67

NADIR MODE

PRT TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
VARIABLE TARGET	615	42.00	601	14.00
	616	43.00	602	15.00
	617	44.00	603	16.00
	618	45.00	604	17.00
	619	46.00	605	18.00
	620	47.00	606	19.00
	621	48.00	607	20.00
FIXED TARGET	622	49.00	608	21.00
	623	50.00	609	22.00
	624	51.00	610	23.00
	625	52.00	611	24.00
	626	53.00	612	25.00
	627	67.00	613	69.00
	628	68.00	614	70.00
BASEPLATE	629	71.00	630	72.00
	631	26.00	632	27.00

THERMOCOUPLE TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
FIXED TARGET SHROUD	558	5.00	537	34.00
	559	6.00	538	35.00
VARIABLE TARGET SHROUD	550	7.00	524	36.00
	551	8.00	525	37.00
FIXED TARGET N2	506	57.00	502	30.00
	507	58.00	503	31.00
VARIABLE TARGET N2	516	59.00	511	32.00
	517	60.00	512	33.00
HEATER N2	514	1.00	509	38.00
	515	2.00	510	39.00
FIXED TARGET FLOW METER	508	63.00	504	61.00
VARIABLE TARGET FLOW METER	518	64.00	513	62.00
BASEPLATE HEATER N2	519	3.00	520	4.00
BASEPLATE N2	521	9.00	522	10.00
BASEPLATE FLOW METER	523	65.00		
ADJUNCT RADIATORS	575	73.00	577	74.00
	579	75.00	581	76.00

TEST DATA SHEET 32

Digital-A Data Output Nadir Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.4)

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Position*	Required**	Pass/Fail PASS	Element (For Ref)	Position*	Required**	Pass/Fail PASS
01	0018	15934	16,500±4000		0030	15939	16,500±4000	
02	0052	15932			0064	15940		
03	0086	15931			0098	15936		
04	0120	15934			0132	15939		
05	0154	15929			0166	15942		
06	0188	15929			0200	15939		
07	0222	15931			0234	15937		
08	0256	15933			0268	15939		
09	0290	15932			0302	15941		
10	0324	15934			0336	15938		
11	0356	15928			0370	15940		
12	0392	15930			0404	15939		
13	0426	15935			0438	15937		
14	0460	15932			0472	15938		
15	0494	15934			0506	15944		
16	0528	15935			0540	15937		
17	0562	15934			0574	15939		
18	0596	15938			0608	15938		
19	0630	15929			0642	15934		
20	0664	15932			0676	15937		
21	0698	15938			0710	15937		
22	0732	15934			0744	15938		
23	0766	15932			0778	15937		
24	0800	15933			0812	15938		
25	0834	15931			0846	15940		
26	0868	15931			0880	15935		
27	0902	15933			0914	15936		
28	0936	15936			0948	15938		
29	0970	15931			0982	15940		
30	1004	15930	16,500±4000		1016	15936	16,500±4000	
CC	1038	0	0		1050	0	0	
WC	1190	0	0		1202	0	0	

* 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: 373237 S/N: 108

R. Hais 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00
Quality Control Date

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:53:59 SCAN NUMBER 382

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 9

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	15939	9	15941	17	15939	25	15940
2	15940	10	15938	18	15938	26	15935
3	15936	11	15940	19	15934	27	15936
4	15939	12	15939	20	15937	28	15938
5	15942	13	15937	21	15937	29	15940
6	15939	14	15938	22	15939	30	15936
7	15937	15	15944	23	15937	CC	0
8	15939	16	15937	24	15938	WC	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS 32

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:53:35 SCAN NUMBER 380

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 3

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	15934	9	15932	17	15934	25	15931
2	15932	10	15934	18	15938	26	15931
3	15931	11	15928	19	15929	27	15933
4	15934	12	15930	20	15932	28	15936
5	15929	13	15935	21	15938	29	15931
6	15929	14	15932	22	15934	30	15930
7	15931	15	15934	23	15932	CC	0
8	15933	16	15935	24	15933	WC	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

7DS 32

TEST DATA SHEET 33 (Sheet 1 of 2)
Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1	24.62	25 ± 15	PASS
1092	A1-1 Warm Load 2	24.62	25 ± 15	
1094	A1-1 Warm Load 3	24.68	25 ± 15	
1096	A1-1 Warm Load 4	24.70	25 ± 15	
1098	A1-1 Warm Load Center	24.63	25 ± 15	
1100	A1-2 Warm Load 1	26.81	25 ± 15	
1102	A1-2 Warm Load 2	26.74	25 ± 15	
1104	A1-2 Warm Load 3	26.80	25 ± 15	
1106	A1-2 Warm Load 4	26.80	25 ± 15	
1108	A1-2 Warm Load Center	26.79	25 ± 15	
1110	Local Oscillator Channel 7	30.61	25 ± 15	
1112	Local Oscillator Channel 8	33.46	25 ± 15	
1114	Local Oscillator Channel 15	32.91	25 ± 15	
1116	PLL LO #2 Channels 9-14	29.39	25 ± 15	
1118	PLL LO #1 Channels 9-14	36.06	25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***	N/A AMSU 6 SEIT	25 ± 15	
1122	Mixer I.F. Amp. Channel 3	32.64	25 ± 15	
1124	Mixer I.F. Amp. Channel 4	32.77	25 ± 15	
1126	Mixer I.F. Amp. Channel 5	32.68	25 ± 15	
1128	Mixer I.F. Amp. Channel 6	30.17	25 ± 15	
1130	Mixer I.F. Amp. Channel 7	30.72	25 ± 15	
1132	Mixer I.F. Amp. Channel 8	32.82	25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14	29.58	25 ± 15	
1136	Mixer I.F. Amp. Channel 15	31.92	25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14	32.16	25 ± 15	PASS
1140	I.F. Amp. Channel 9	32.31	25 ± 15	
1142	I.F. Amp. Channel 10	32.38	25 ± 15	
1144	I.F. Amp. Channel 11	29.82	25 ± 15	
1146	DC/DC Converter	34.79	25 ± 15	
1148	I.F. Amp. Channel 13	29.84	25 ± 15	
1150	I.F. Amp. Channel 14	29.82	25 ± 15	
1152	I.F. Amp. Channel 12	29.90	25 ± 15	
1154	RF Shelf A1-1	30.73	25 ± 15	
1156	RF Shelf A1-2	32.19	25 ± 15	
1158	Detector Preamp Assy.	27.63	25 ± 15	
1160	Scan Motor A1-1	24.35	25 ± 15	
1162	Scan Motor A1-2	26.10	25 ± 15	
1164	Feed Horn A1-1	27.09	25 ± 15	
1166	Feed Horn A1-2	29.64	25 ± 15	
1168	R.F. Mux A1-1	29.64	25 ± 15	
1170	R.F. Mux A1-2	32.25	25 ± 15	
1172	Local Oscillator Channel 3	33.82	25 ± 15	
1174	Local Oscillator Channel 4	34.37	25 ± 15	
1176	Local Oscillator Channel 5	33.47	25 ± 15	
1178	Local Oscillator Channel 6	29.79	25 ± 15	
1180	Temp Sensor Ref Voltage Count	25046	**	

* 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: 373237 S/N: 108

K. Hail 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00
Quality Control Date

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:54:13 SCAN NUMBER 384

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 1 TO 16

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR A1-1	18586	24.35	9	LO CHANNEL 5	23059	33.47
2	SCAN MOTOR A1-2	19422	26.10	10	LO CHANNEL 6	21453	29.79
3	FEEDHORN A1-1	20190	27.09	11	LO CHANNEL 7	21897	30.61
4	FEEDHORN A1-2	21482	29.64	12	LO CHANNEL 8	23285	33.46
5	RF MUX A1-1	21050	29.64	13	LO CHANNEL 15	22836	32.91
6	RF MUX A1-2	22609	32.25	14	PLLO #2 CH 9/14	21117	29.39
7	LO CHANNEL 3	23165	33.82	15	PLLO #1 CH 9/14	24501	36.06
8	LO CHANNEL 4	23996	34.37	16	PLLO REFERENCE	32767	52.55

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN
SELECT TOUCHSCREEN BUTTON 2

TDS 33

AMSU A1-29 A1.EXE NADIR MODE P1 3-MAR-00 03:54:22 SCAN NUMBER 385

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES 17 TO 32

NO		DATA	TEMP C	NO		DATA	TEMP C
17	MIXER IF CH 3	22659	32.64	25	IF AMP CH 11/14	22523	32.16
18	MIXER IF CH 4	22889	32.77	26	IF AMP CH 9	22823	32.31
19	MIXER IF CH 5	22555	32.68	27	IF AMP CH 10	22649	32.38
20	MIXER IF CH 6	21572	30.17	28	IF AMP CH 11	21634	29.82
21	MIXER IF CH 7	21808	30.72	29	DC/DC CONVERTER	24074	34.79
22	MIXER IF CH 8	22857	32.82	30	IF AMP CH 13	21342	29.84
23	MIXER IF CH 9/14	21221	29.58	31	IF AMP CH 14	21511	29.82
24	MIXER IF CH 15	22404	31.92	32	IF AMP CH 12	20961	29.90

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS33

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AMSU  A1-29 A1.EXE    NADIR MODE          P1  3-MAR-00 03:54:34  SCAN NUMBER   387
[ 5 ] DIGITAL A DATA  ELEMENT 0000
[ 6 ] DIGITAL B DATA  ELEMENT   00
[ 7 ] ANALOG DATA     ELEMENT   00

                          DIGITAL A TEMPERATURES 31 TO 46
NO                      DATA    TEMP C        NO                         DATA    TEMP C

31 IF AMP CH 14         21517    29.84        39 A1-1 WARM LOAD 4 23664     24.70
32 IF AMP CH 12         20969    29.92        40 A1-1 WARM LOAD C 24091     24.63
33 RF SHELF A1-1        21991    30.73        41 A1-2 WARM LOAD 1 24760     26.81
34 RF SHELF A1-2        22759    32.19        42 A1-2 WARM LOAD 2 24890     26.74
35 DETECTOR/PREAMP      20341    27.63        43 A1-2 WARM LOAD 3 24785     26.80
36 A1-1 WARM LOAD 1     23711    24.62        44 A1-2 WARM LOAD 4 24627     26.80
37 A1-1 WARM LOAD 2     23744    24.62        45 A1-2 WARM LOAD C 25054     26.79
38 A1-1 WARM LOAD 3     23804    24.68        THERMAL REFERENCE   25046
[ 21 ] UP                     [ 22 ] DOWN

        POWER [ 4 ]   ON
                      SCREEN ONLY [ 2 ]   PRINT   [ 3 ] FULL        [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 2
```

TDS33

TEST DATA SHEET 34

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

	From	Description	To	Measured (volts)	Required (volts)	Pass/Fail
03	J6-02	RF Shelf A1-1 Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
01	J6-03	A1-1 Scan Motor Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
05	J6-04	Warm Load A1-1 Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
04	J6-21	RF Shelf A1-2 Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
02	J6-22	A1-2 Scan Motor Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
06	J6-23	Warm Load A1-2 Temp.	J1-10	4.4 V	3.5 ± 2 V	PASS
25	J6-06	PLLO No. 2 Lock detect	J2-03	80mV	***	PASS
07	J6-08	A1-1 Drive Motor Curr.	J2-03	2.12 V	3.5 ± 2 V	PASS
10	J6-09	+15 V Antenna Drive	J2-03	3.62 V	3.5 ± 2 V	PASS
15	J6-10	+5 V Antenna Drive	J2-03	3.12 V	3.5 ± 2 V	PASS
09	J6-11	+15 V Signal Processing	J2-03	3.54 V	3.5 ± 2 V	PASS
14	J6-12	+5 V Signal Processing	J2-03	3.06 V	3.5 ± 2 V	PASS
22	J6-13	L.O. Voltage Channel 3	J2-03	3.58 V	3.5 ± 2 V	PASS
24	J6-14	L.O. Voltage Channel 5	J2-03	3.58 V	3.5 ± 2 V	PASS
20	J6-15	L.O. Voltage Channel 7	J2-03	3.58 V	3.5 ± 2 V	PASS
16	J6-16	+15 V PLL LO Ch 9-14	J2-03	3.50 V	3.5 ± 2 V	PASS
17	J6-17	*	J2-03	3.56 V	3.5 ± 2 V	PASS
27	J6-18	L.O. Voltage Channel 15	J2-03	3.56 V	3.5 ± 2 V	PASS
26	J6-25	PLLO No. 1 Lock detect	J2-03	4.48 V	***	PASS
08	J6-27	A1-2 Drive Motor Curr.	J2-03	1.94 V	3.5 ± 2 V	PASS
12	J6-28	-15 V Antenna Drive	J2-03	3.14 V	3.5 ± 2 V	PASS
11	J6-29	-15 V Signal Processing	J2-03	3.14 V	3.5 ± 2 V	PASS
23	J6-30	L.O. Voltage Channel 4	J2-03	3.6 V	3.5 ± 2 V	PASS
21	J6-31	L.O. Voltage Channel 6	J2-03	3.6 V	3.5 ± 2 V	PASS
19	J6-32	L.O. Voltage Channel 8	J2-03	3.6 V	3.5 ± 2 V	PASS
18	J6-33	-15 V PLL LO Ch 9-14	J2-03	3.0 V	3.5 ± 2 V	PASS
13	J6-34	**	J2-03	3.28 V	3.5 ± 2 V	PASS

* +8.5 V PLL LO Ch 9-14 for S/N 101-104, +10V Mixer Amp for S/N 105 and above.
** +8 V Receiver for S/N 101-104, +8 V IF 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 FINAL LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer [signature] Date 3-3-00

Customer Representative (Flight Hardware Only) Date 3-4-00

Quality Control [signature] 7A 194 Date 3-3-00

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

	Description	(*)	Measured (Deg. C)	Required (Deg. C)	Pass/Fail
01	A1-1 Scanner Motor	Temp	20.73	25 ± 15	P
02	A1-2 Scanner Motor	Temp	23.16	25 ± 15	
03	A1-1 RF Shelf	Temp	23.40	25 ± 15	
04	A1-2 RF Shelf	Temp	28.56	25 ± 15	
05	A1-1 Warm Load	Temp	20.83	25 ± 15	
06	A1-2 Warm Load	Temp	23.45	25 ± 15	
			(mAmps)	(mAmps)	
07	Ant A1-1 Drv Motor Current		46.54	125 mA (Max)	P
08	Ant A1-2 Drv Motor Current		40.83	125 mA (Max)	P

(*) 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: 373237 S/N: 108

R. Heil 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194 3-3-00
Quality Control Date

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

	Description	(*)	Measured (volts)	Required (volts)	Pass/ Fail
09	Signal Processing	+15 V	14.67	15.0 ± 0.5 V	P
10	Antenna Drive	+15 V	14.72	15.0 ± 0.5 V	
11	Signal Processing	-15 V	-15.08	-15.0 ± 0.5 V	
12	Antenna Drive	-15 V	-15.15	-15.0 ± 0.5 V	
13	Receiver	+8 V	7.83	8.0 ± 0.5 V	
14	Sig Processing	+5 V	4.85	5.0 ± 0.5 V	
15	Antenna Drive	+5 V	4.87	5.0 ± 0.5 V	
16	Phase Lock Loop Ch 9-14 (a)/	+8.5 V	N/A	8.5 ± 0.5 V	N/A
	Receiver/Mixer IF (b)	+10 V	9.74	10.0 ±0.5 V	P
17	Phase Lock Loop Ch 9-14	+15 V	14.50	15.0 ± 0.5 V	
18	Phase Lock Loop Ch 9-14	-15 V	-15.35	-15.0 ± 0.5 V	
19	L.O. #8	Ch-8	9.81	(**)__ ± 0.5 V	
20	L.O. #7	Ch-7	9.82	(**)__ ± 0.5 V	
21	L.O. #6	Ch-6	9.85	(**)__ ± 0.5 V	
22	L.O. #3	Ch-3	9.84	(**)__ ± 0.5 V	
23	L.O. #4	Ch-4	9.80	(**)__ ± 0.5 V	
24	L.O. #5	Ch-5	9.80	(**)__ ± 0.5 V	
25	PLLO No. 2 Lock Detect		.04	(***)	
26	PLLO No. 1 Lock Detect		4.36	(***)	
27	L.O. #15	Ch-15	14.68	(**)__ ± 0.5 V	

(*) 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: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

R. Hil 3/3/00
Test Systems Engineer Date

3-4-00
Customer Representative Date
(Flight Hardware Only)

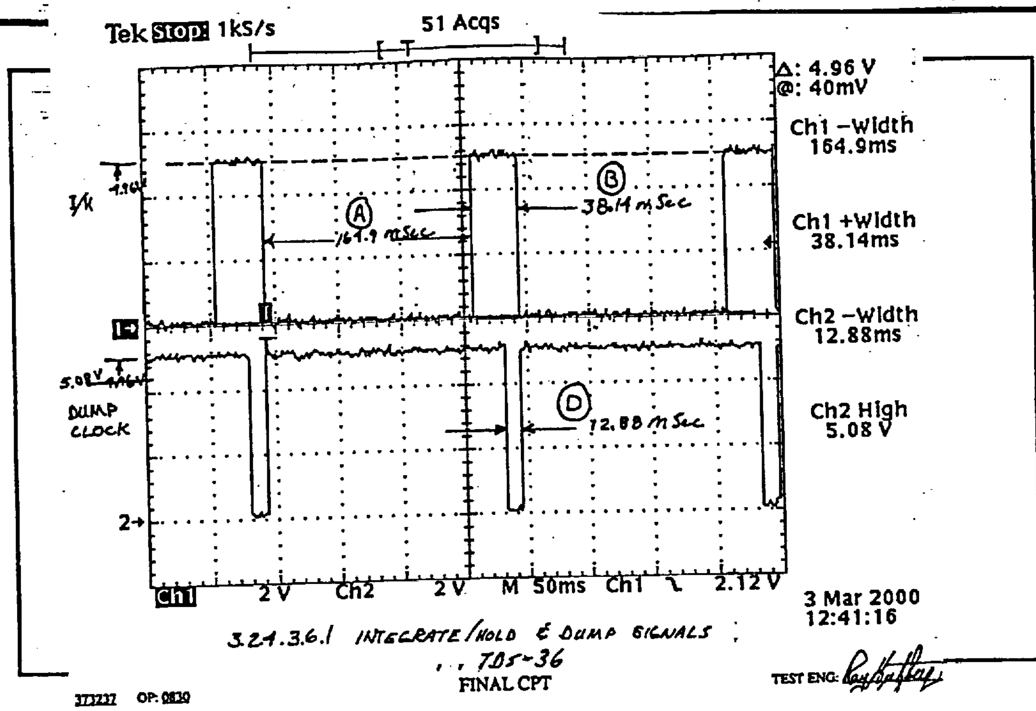
7A 194 3/3/00
Quality Control Date

```
AMSU  A1-29 A1.EXE    FULL SCAN MODE    P1  3-MAR-00 04:01:23  SCAN NUMBER   437
[ 5 ] DIGITAL A DATA  ELEMENT 0000

[ 6 ] DIGITAL B DATA  ELEMENT   00

[ 7 ] ANALOG DATA     ELEMENT   00

                                ANALOG DATA  1 TO 18

 1 A1-1 SCANR MOTOR    216    20.73 DEG C 10 ANTENNA DRIVE              15VDC  14.72
 2 A1-2 SCANR MOTOR    217    23.16 DEG C 11 SIGNAL PROCESSING         -15VDC -15.08
 3 A1-1 RF SHELF       217    23.40 DEG C 12 ANTENNA DRIVE             -15VDC -15.15
 4 A1-2 RF SHELF       221    28.56 DEG C 13 RECEIVER AMPLIFIER          8VDC   7.83
 5 A1-1 WARM LOAD      216    20.83 DEG C 14 SIGNAL PROCESSOR           5 VDC   4.85
 6 A1-2 WARM LOAD      218    23.45 DEG C 15 ANTENNA DRIVE              5 VDC   4.87
 7 ANT A1-1 DRIVE MOTOR CURRENT     46.54 16 RECEIVER MIXER/IF          10VDC   9.74
 8 ANT A1-2 DRIVE MOTOR CURRENT     40.83 17 PHASE LOCK LOOP CH9/14     15VDC  14.50
 9 SIGNAL PROCESSING       +15VDC   14.67 18 PHASE LOCK LOOP CH9/14    -15VDC -15.35
[ 21 ] UP                 [ 22 ]  DOWN

       POWER [ 4 ]  ON
                    SCREEN ONLY [ 2 ]   PRINT  [ 3 ] FULL       [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 2
```

TDS 35

```
AMSU  A1-29 A1.EXE     FULL SCAN MODE      P1   3-MAR-00 04:01:36  SCAN NUMBER    439
[ 5 ] DIGITAL A DATA   ELEMENT 0000

[ 6 ] DIGITAL B DATA   ELEMENT    00

[ 7 ] ANALOG DATA      ELEMENT    00

                                  ANALOG DATA 10 TO 27

10 ANTENNA DRIVE                15VDC  14.71 19 L.O. VOLTAGE       CH 8           9.81
11 SIGNAL PROCESSING           -15VDC -15.10 20 L.O. VOLTAGE       CH 7           9.82
12 ANTENNA DRIVE               -15VDC -15.15 21 L.O. VOLTAGE       CH 6           9.85
13 RECEIVER AMPLIFIER            8VDC   7.82 22 L.O. VOLTAGE     4 CH 3           9.84
14 SIGNAL PROCESSOR             5 VDC   4.84 23 L.O. VOLTAGE     5 CH 4           9.80
15 ANTENNA DRIVE                5 VDC   4.86 24 L.O. VOLTAGE     6 CH 5           9.80
16 RECEIVER MIXER/IF            10VDC   9.72 25 PLLO # 2 LOCK DETECT              0.04
17 PHASE LOCK LOOP CH9/14       15VDC  14.50 26 PLLO # 1 LOCK DETECT              4.36
18 PHASE LOCK LOOP CH9/14      -15VDC -15.36 27 L.O. VOLTAGE       CH15          14.68
[ 21 ] UP                      [ 22 ] DOWN

         POWER [ 4 ]   ON
                       SCREEN ONLY [ 2 ]   PRINT   [ 3 ] FULL       [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 2
```

TEST DATA SHEET 36
Integrate/Hold and Dump Signal Verification (Paragraph 3.2.4.3.6.1)



Parameter	Measured	Required	Pass/ Fail
Scope Channel-1: Integration/Hold			
Time Measured (A)*	164.9 ms	165 ms ± 10%	PASS
Time Measured (B)*	38.14 ms	35 ms ± 10%	PASS
Amplitude Measured	4.96 V	5.0 ± 0.2 V	PASS
Scope Channel-2: Dump Signal			
Time Measured (D)*	12.88 ms	9 ms to 15 ms	PASS
Amplitude Measured	5.08 V	5.0 ± 0.2 V	PASS

* Refer to Figure 2 for waveform configuration.

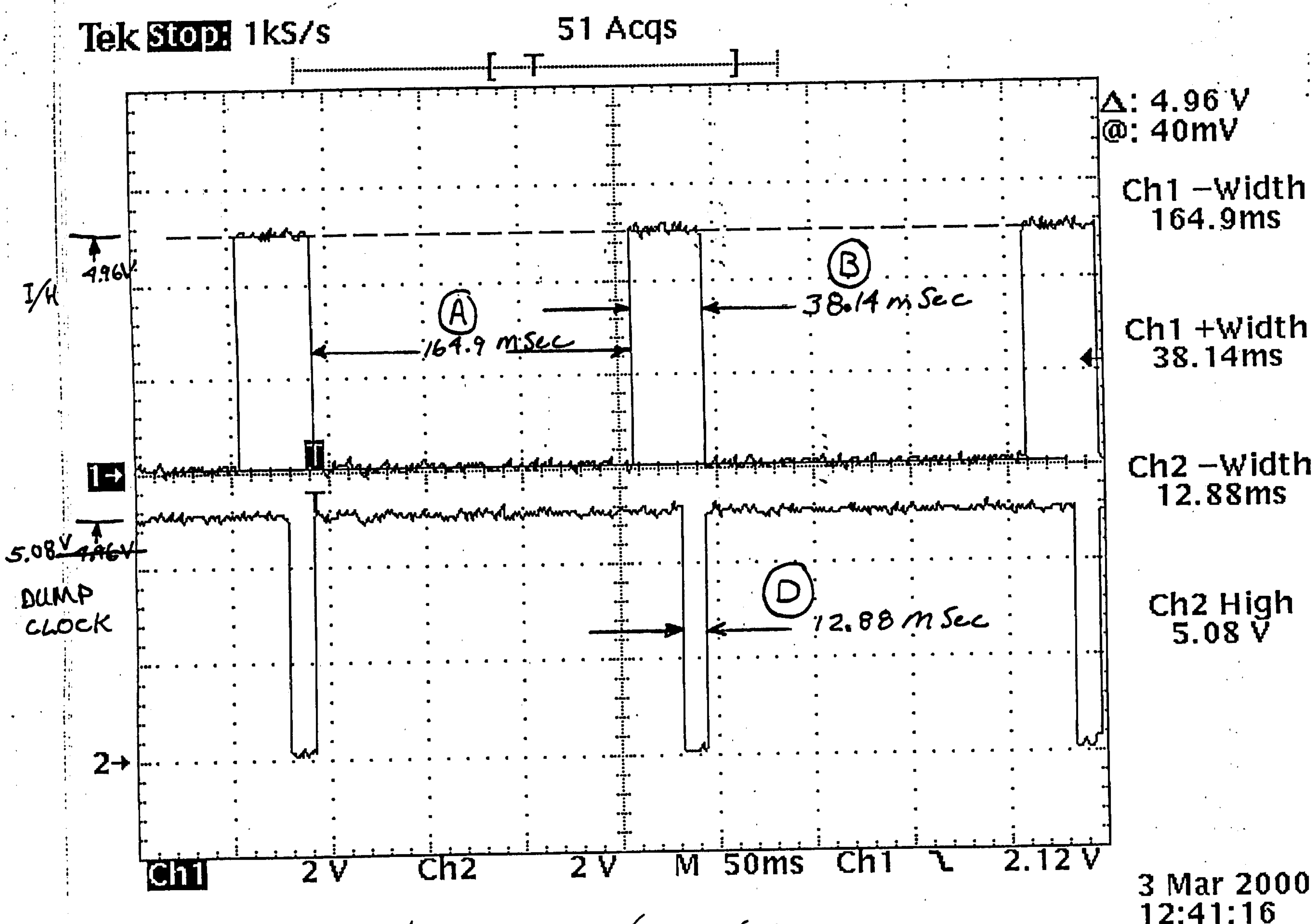
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer Date 3-3-00

Customer Representative (Flight Hardware Only) Date 3-4-00

Quality Control Date 3-3-00



3.24.3.6.1 INTEGRATE/HOLD & DUMP SIGNALS

TDS-36

FINAL CPT

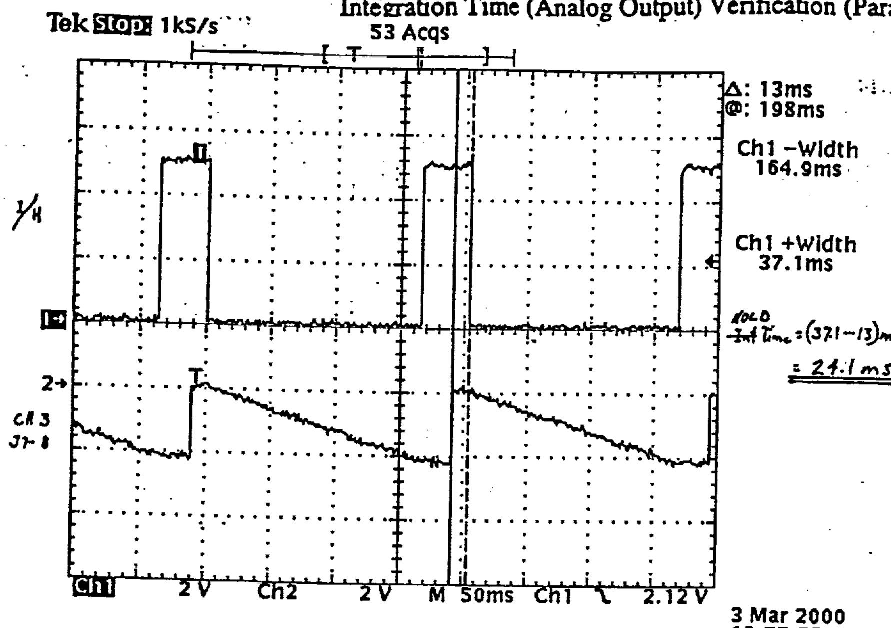
TEST ENG: [signature] DATE 3-3-00

S/O: 373237 OP: 0830

AE-26156/3C
6 Apr 99

TEST DATA SHEET 37

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



324.3.6.2 INTEGRATION TIME CH 3

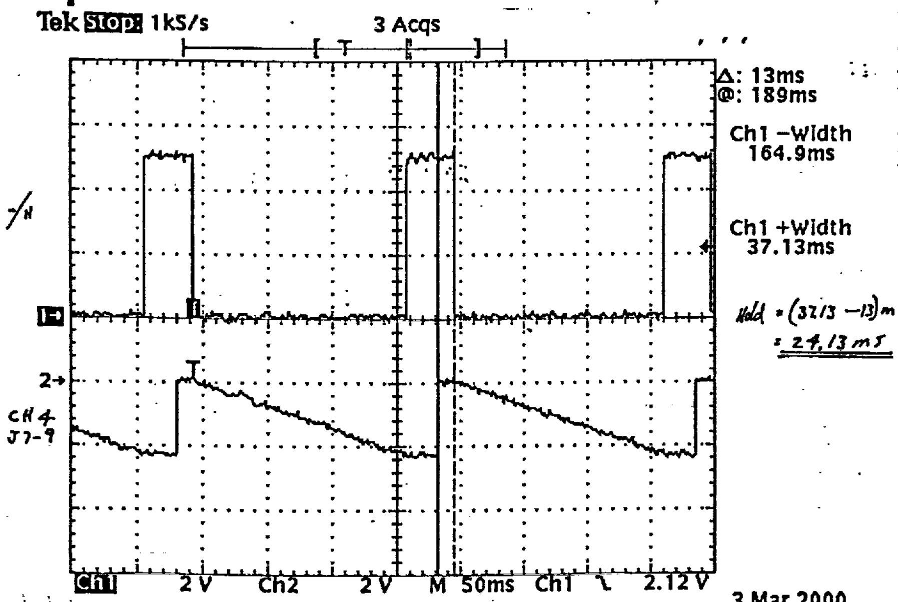
Hold Int Time = (37.1 − 13)ms = 24.1 ms

Channel 03
Frequency: 50.3 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.1 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



324.3.6.2 Integration Time CH 4

Hold = (37.13 − 13)ms = 24.13 ms

Channel 04
Frequency: 52.8 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.13 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

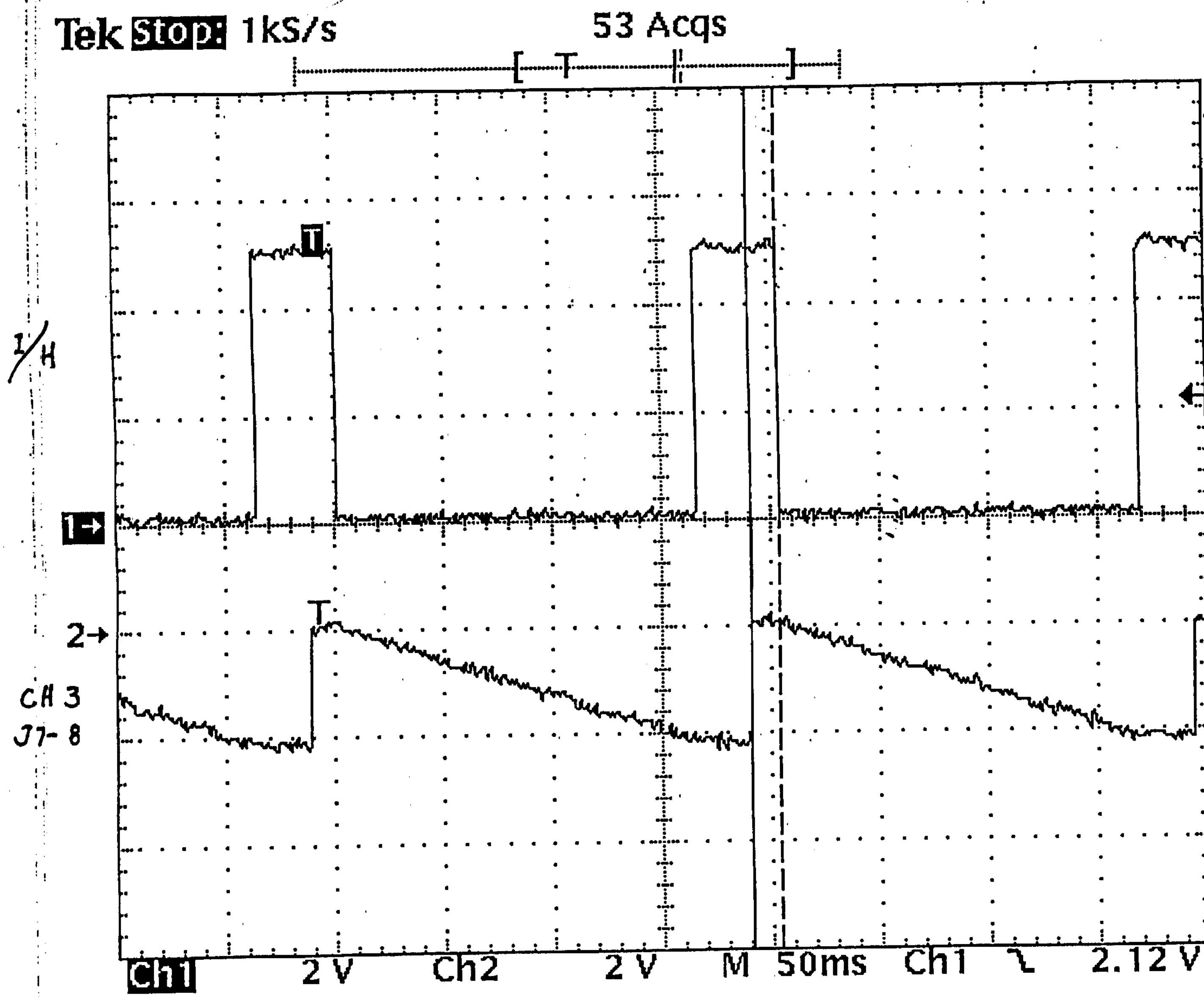
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer 3-3-00 Date

Customer Representative (Flight Hardware Only) 3-4-00 Date

Quality Control 3-3-00 Date



HOLD ~~Int~~ Time = (37.1 − 13) ms

= 24.1 ms

3 Mar 2000
12:55:33

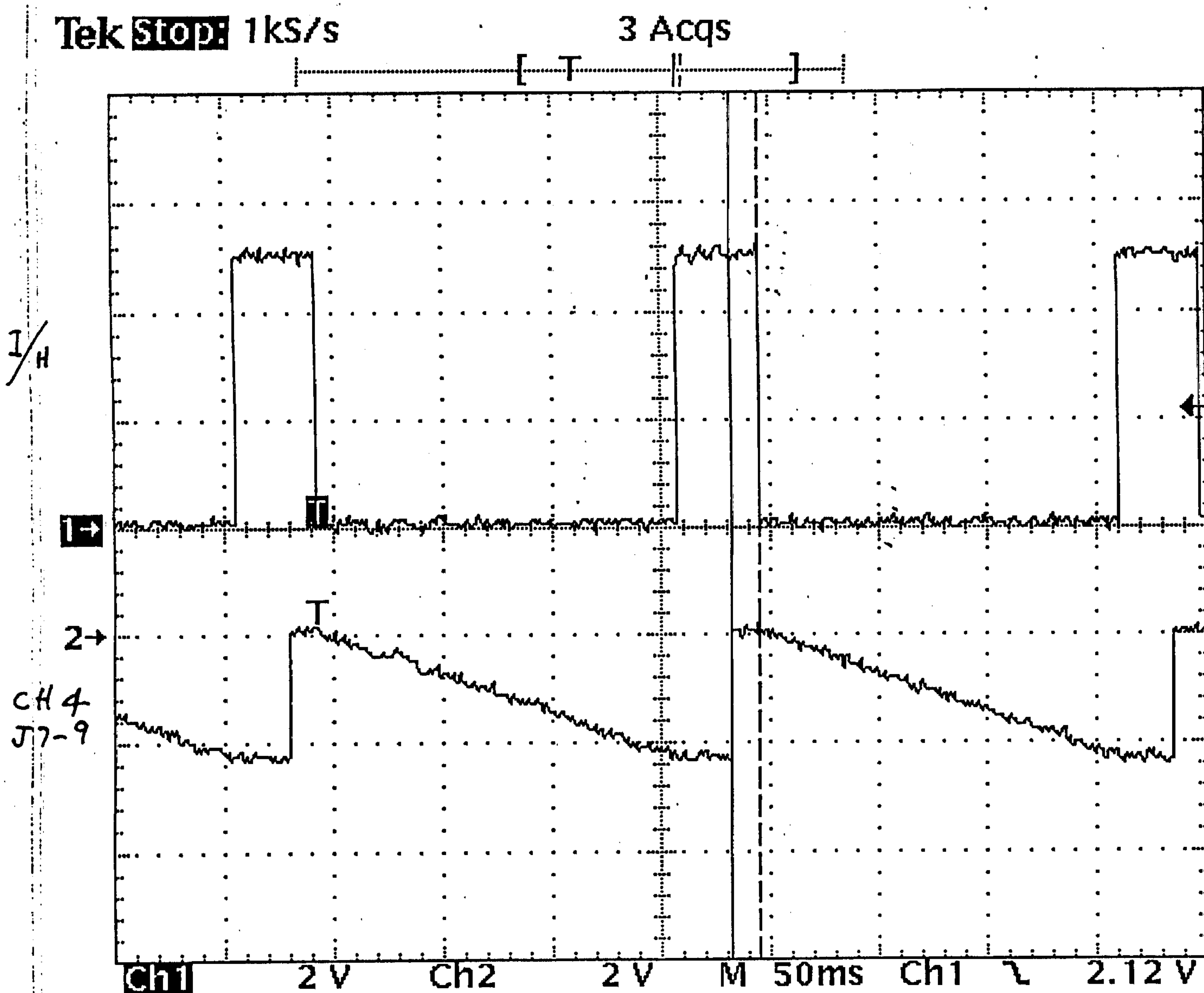
3.2.4.3.6.2 INTEGRATION TIME CH 3

TDS − 37

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

S/O : 272227 OP: 0830



Hold = (37.13 − 13) ms
= 24.13 ms

3 Mar 2000
12:57:25

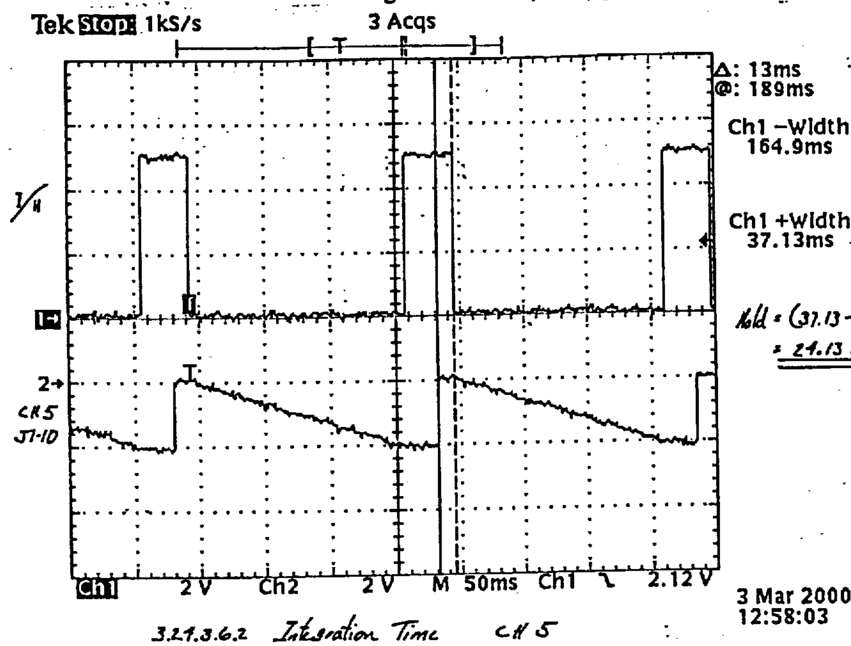
3.2.4.3.6.2 Integration Time CH 4
TDS-37

FINAL CPT

TEST ENG: [signature] DATE 3-3-00

TEST DATA SHEET 38

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



3.2.4.3.6.2 Integration Time CH 5

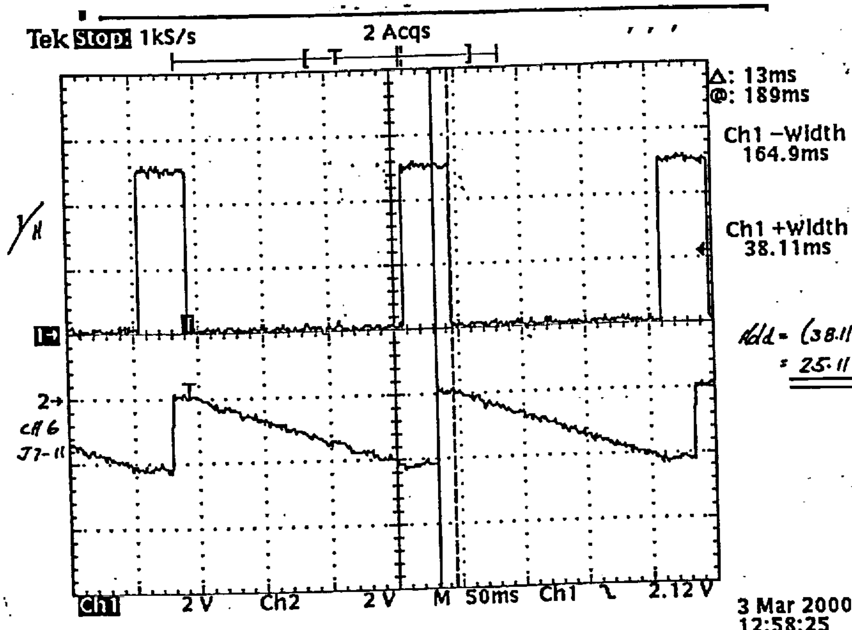
Hold = (37.13 – 13)ms = 24.13 mSec

Channel 05
Frequency: 53.596 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.13 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



3.2.4.3.6.2 Integration Time CH 6

Hold = (38.11 – 13) = 25.11 ms

Channel 06
Frequency: 54.4 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 25.11 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

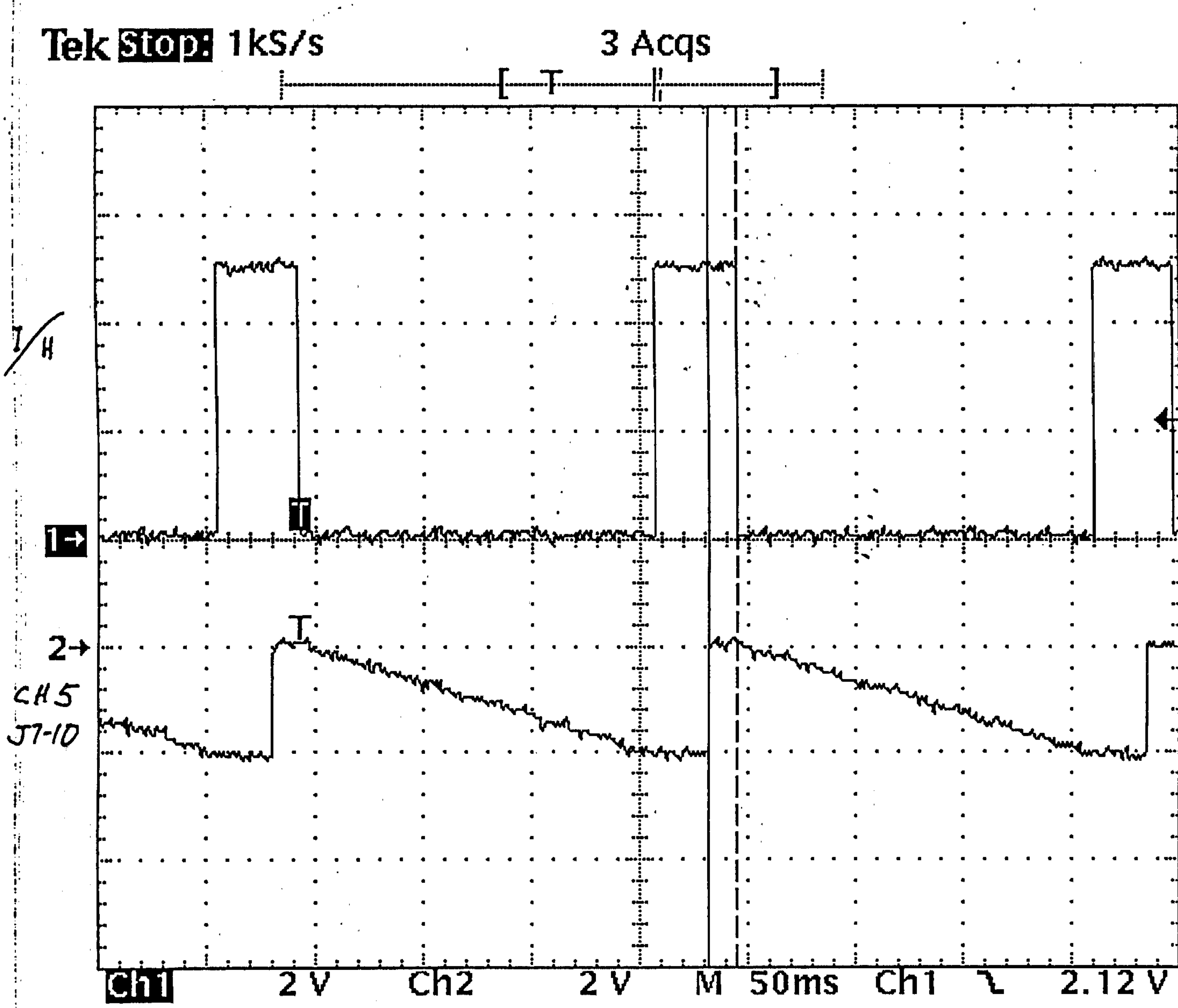
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 873237 S/N: 108

Ray Kirtberg 3-3-00
Test Systems Engineer Date

7A 194
Quality Control 3-3-00 Date

3-4-00
Customer Representative (Flight Hardware Only) Date



Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

Ch1 +Width
37.13ms

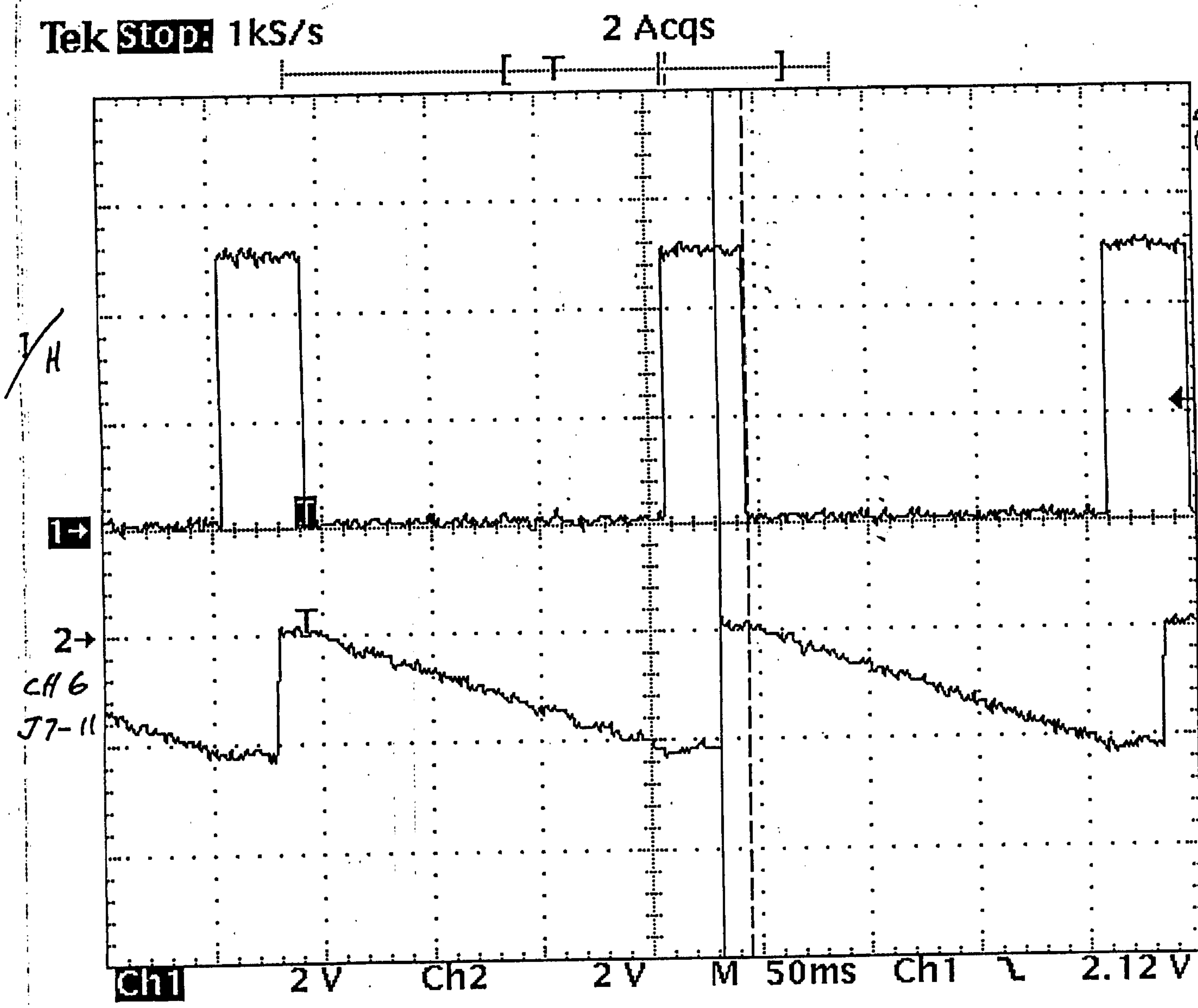
Hold = (37.13 − 13) ms
= 24.13 mSec

3 Mar 2000
12:58:03

3.24.3.6.2 Integration Time CH 5
TDS − 38

FINAL CPT

TEST ENG: [signature] DATE 3-3-00



Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

Ch1 +Width
38.11ms

Hold = (38.11 − 13) ms
= 25.11 mSec

3 Mar 2000
12:58:25

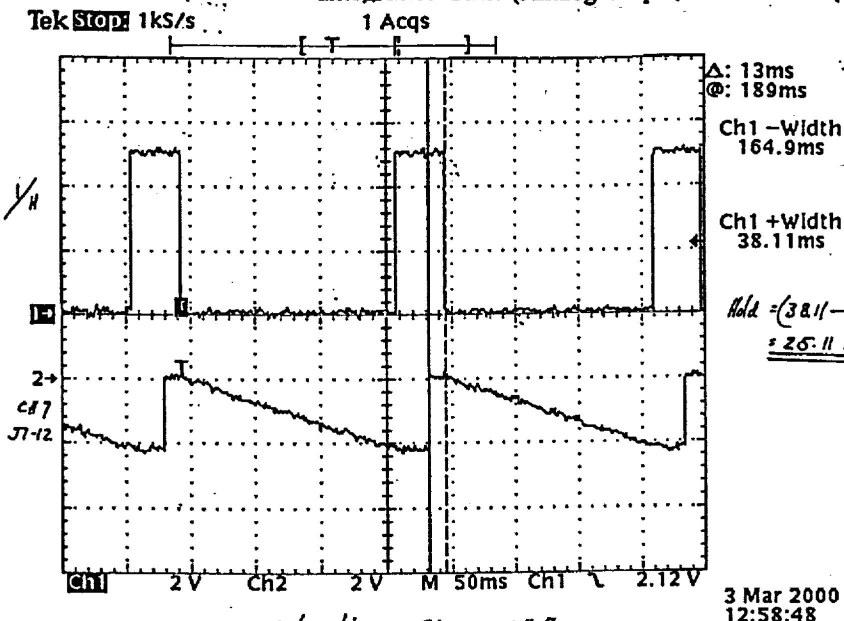
3.2.4.36.2 Integration Time CH 6

TDS-38
FINAL CPT

TEST ENG: Ray Hubberg DATE 3-3-00

TEST DATA SHEET 39

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



Y/H

CH 7
J1-12

3.2.4.3.6.2 Integration Time CH 7

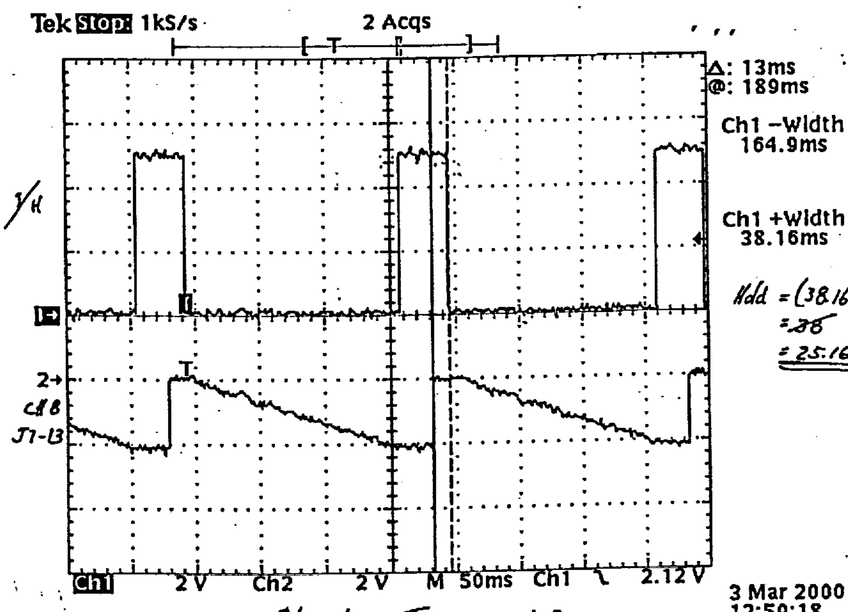
Hold =(38.11−13)= 25.11 mS.

Channel 07
Frequency: 54.94 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 25.11 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



Y/H

CH 8
J1-13

3.2.4.3.6.2 Integration Time CH 8

Hold = (38.16 − 13) = ~~.38~~ = 25.16 ms

Channel 08
Frequency: 55.5 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 25.16 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

Circle Test: FINAL CPT LPT TAC-39

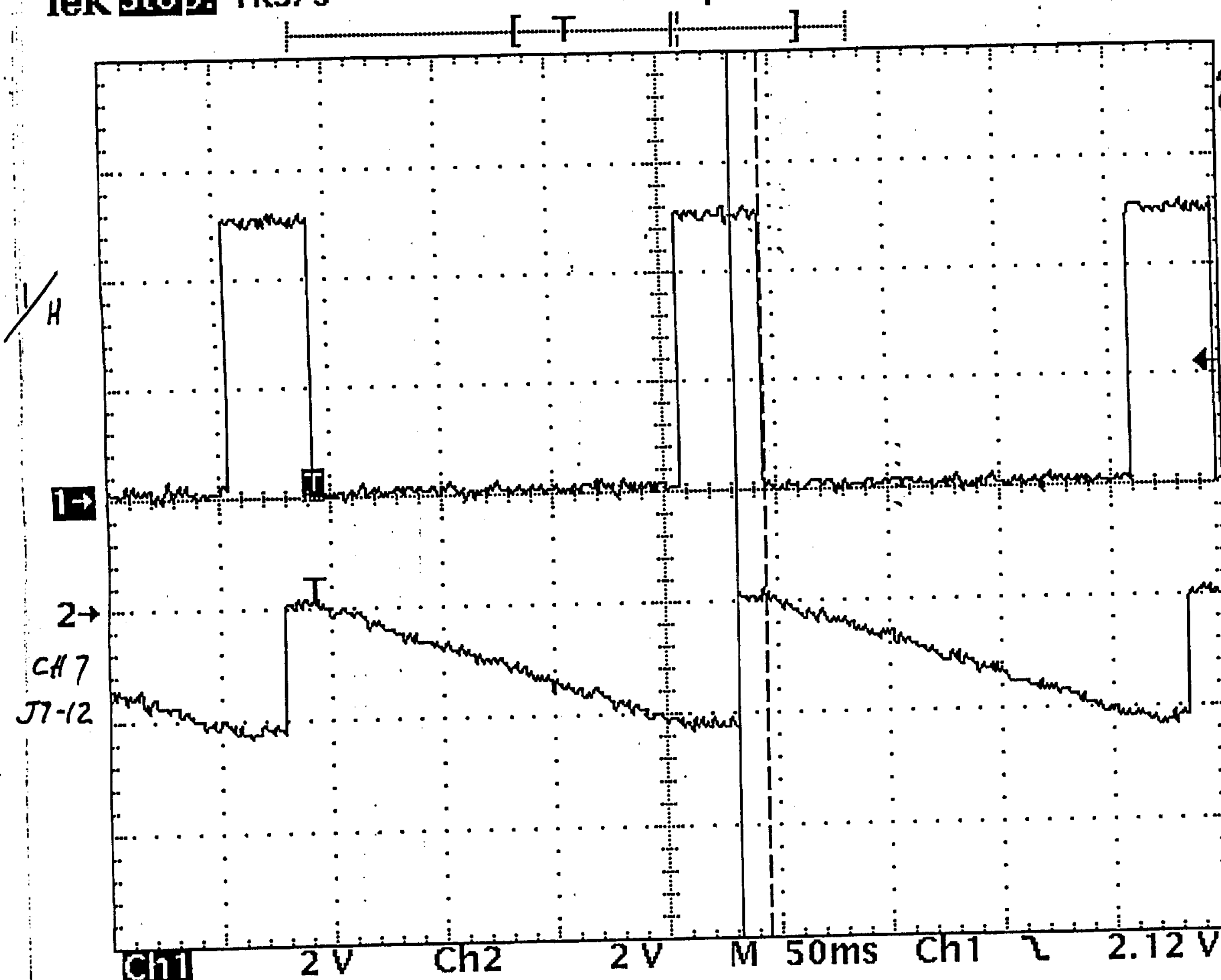
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer [signature] Date 3-3-00

Customer Representative (Flight Hardware Only) Date 3-4-00

Quality Control [signature] 7A 194 Date 3-3-00

Tek Stop: 1kS/s 1 Acqs



Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

Ch1 +Width
38.11ms

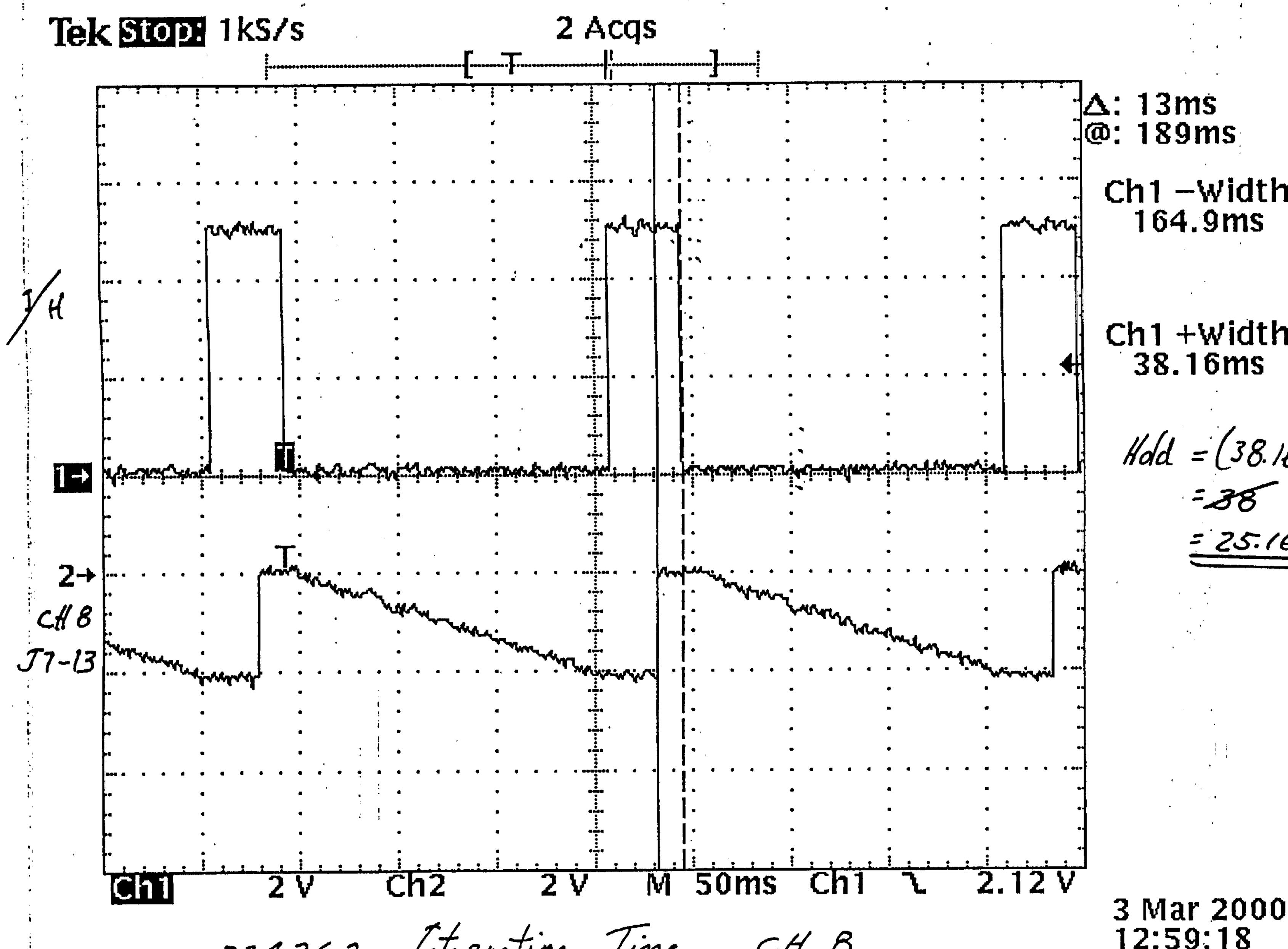
Hold $= (38.11 - 13)$ ms
$= 25.11$ mSec

3 Mar 2000
12:58:48

3.2.4.3.6.2 Integration Time CH 7

TDS – 39
FINAL CPT

TEST ENG: [signature] DATE 3-3-00



1/H

CH 8

J7-13

Hold = (38.16 − 13) mSec

= ~~38~~

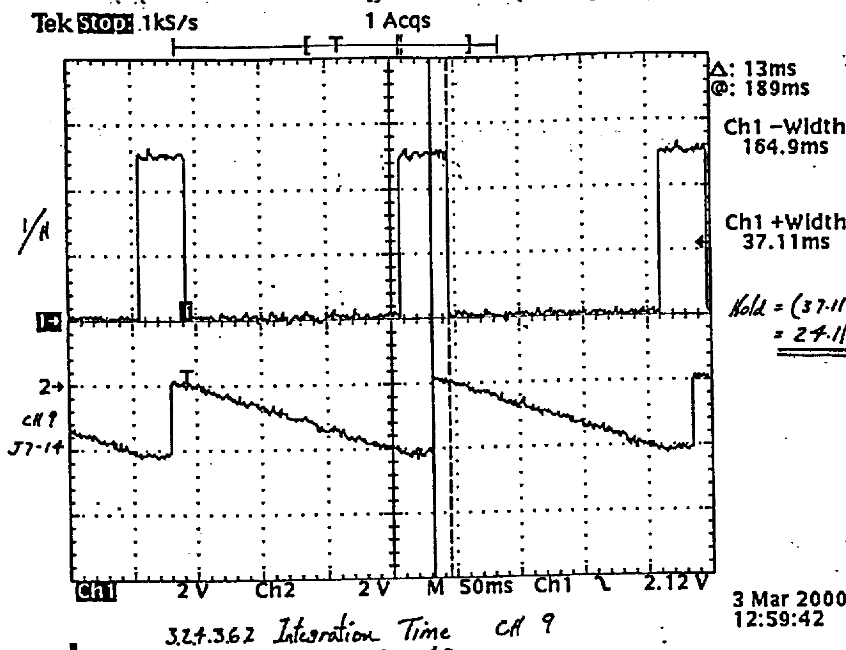
= 25.16 mSec

32436.2 Integration Time CH B

T05-39

TEST ENG: [signature] DATE 3-3-00

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



3.2.4.3.6.2 Integration Time CH 9

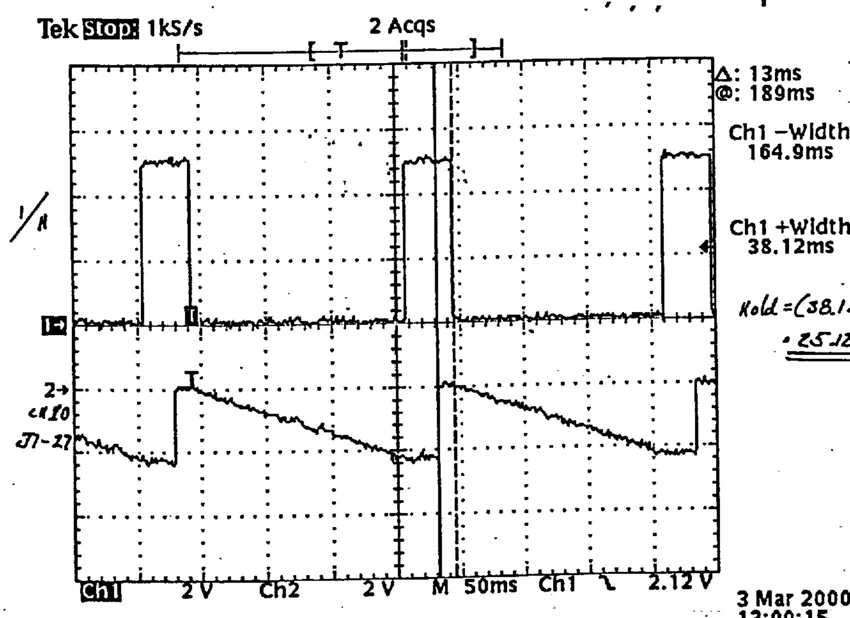
Hold = (37.11 – 13) = 24.11 ms

Channel 09
Frequency: 57.2903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.11 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



3.2.4.3.6.2 Integration Time CH 10

Hold = (38.12 – 13) = 25.12 ms

Channel 10
Frequency: 57.2903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 25.12 ms
Required 25 ms ± 10%
Pass/Fail PASS

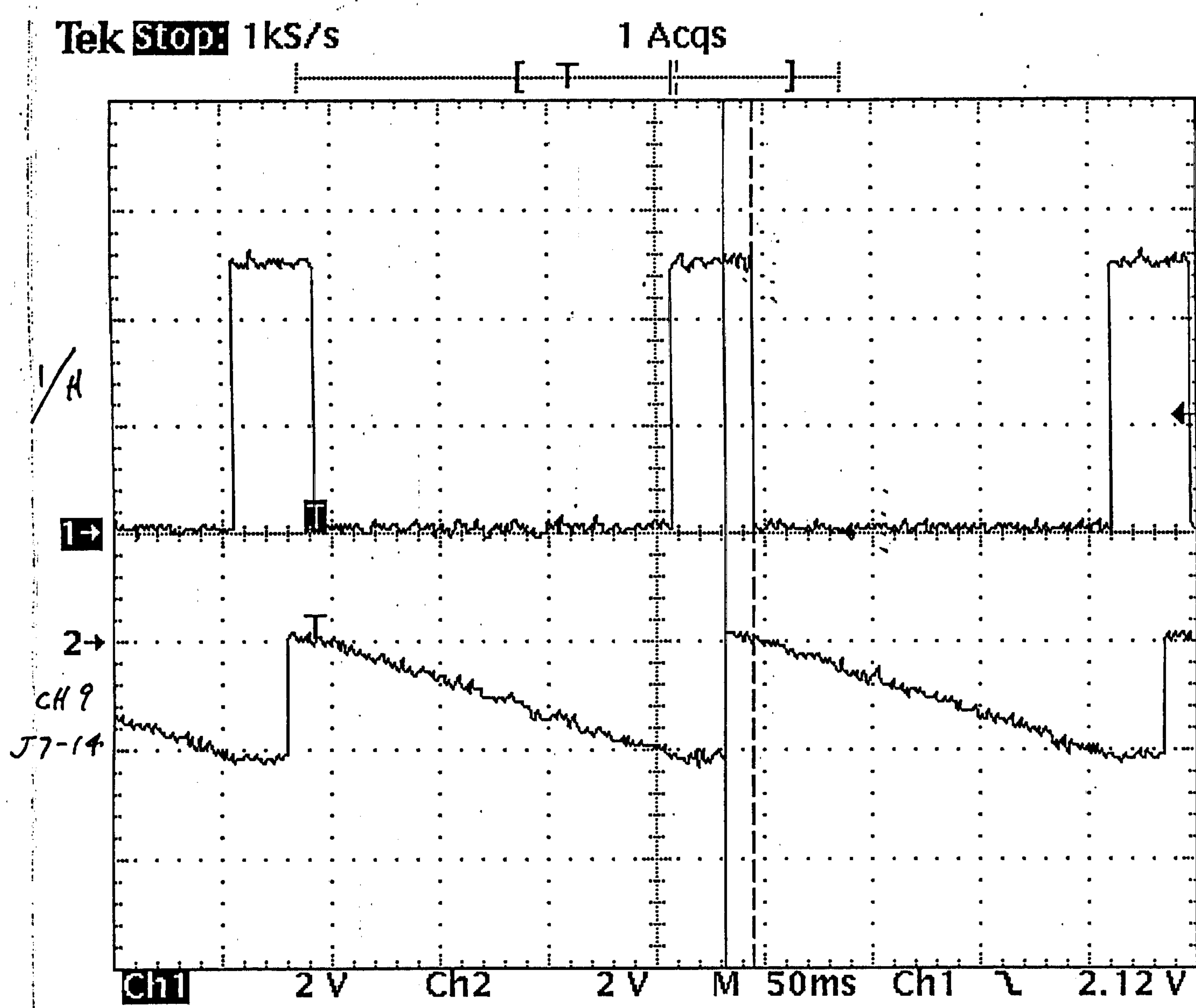
DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

Circle Test: CPT / LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Ray Gutberg 3-3-00
Test Systems Engineer Date

3-4-00 3-3-00
Customer Representative (Flight Hardware Only) Date Quality Control Date



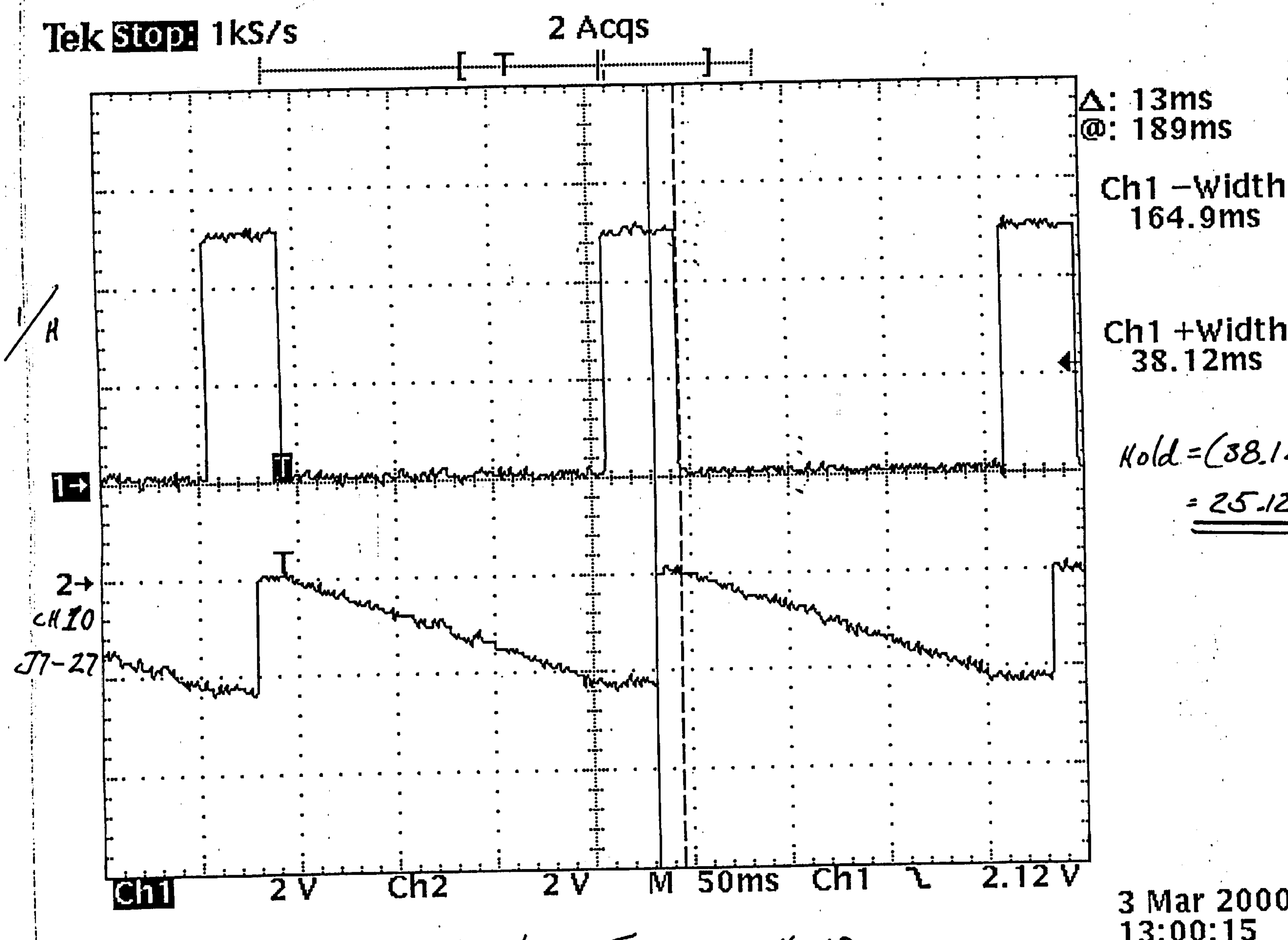
Hold = (37.11 − 13) mSec
= 24.11 mSec

3 Mar 2000
12:59:42

3.2.4.3.6.2 Integration Time CH 9
TDS − 40

FINAL CPT

TEST ENG: [signature] DATE 3-3-00



Hold = (38.12 − 13) mSec

= 25.12 mSec

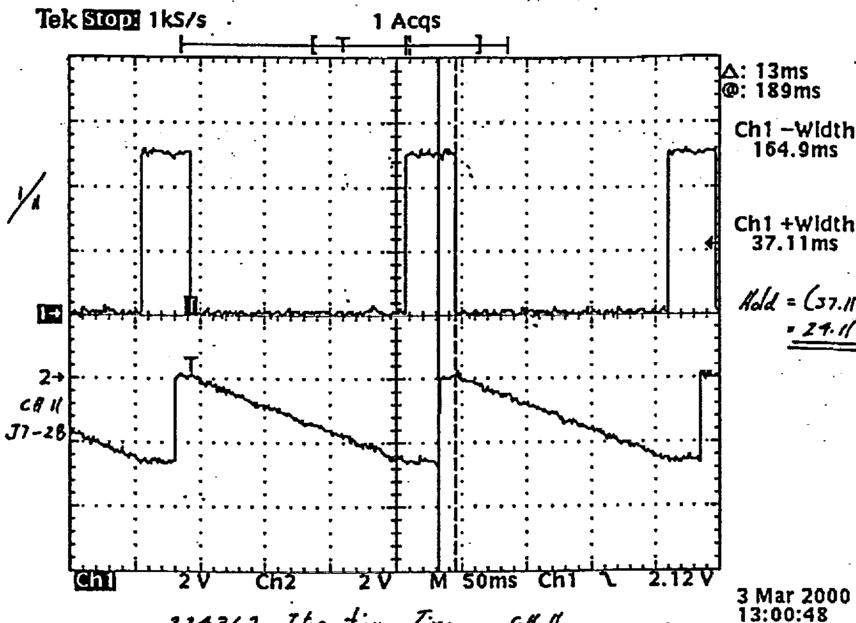
3.2.4.3.6.2 Integration Time CH 10

TDS-40

TEST ENG: [signature] DATE 3-3-00

FINAL CPT

TEST DATA SHEET 41
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



324.362 Integration Time CH 11
TAC-41

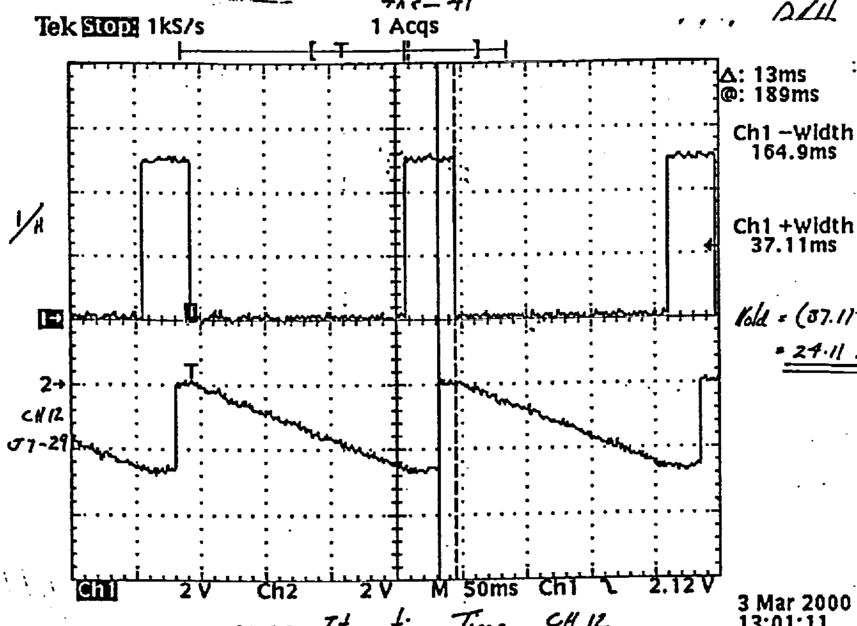
Hold = (37.11 - 13)
= 24.11 mS

Channel 11
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.11 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



324.3.6.2 Integration Time CH 12
TAC-41

Hold = (37.11 - 13)
= 24.11 mSc

Channel 12
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 24.11 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

Circle Test: CPT LPT

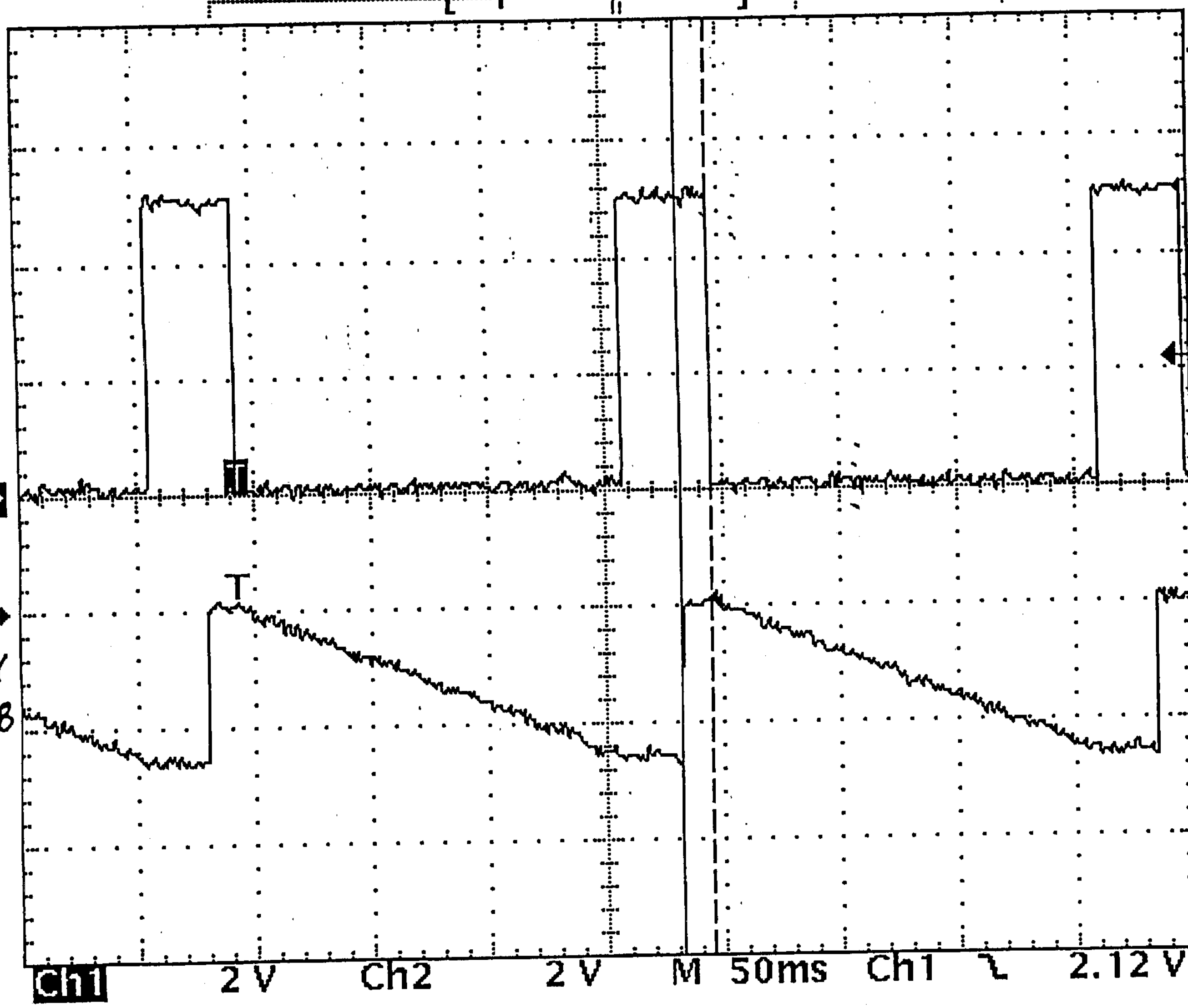
METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Ray Kurtzberg 3-3-00
Test Systems Engineer Date

Customer Representative (Flight Hardware Only) 3-4-00 Date

Quality Control 3-3-00 Date

Tek Stop: 1kS/s 1 Acqs



CH 11
J7-28

Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

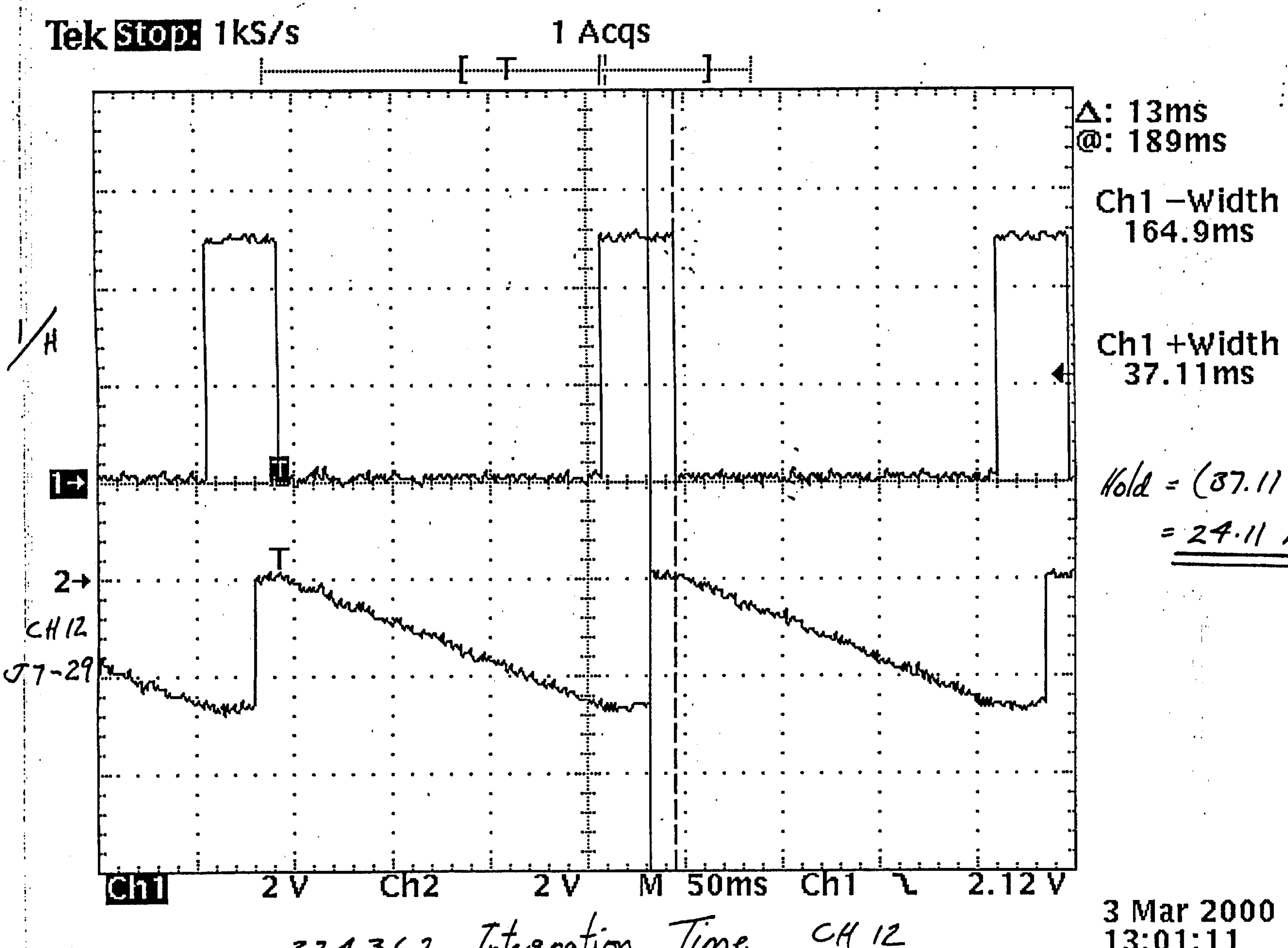
Ch1 +Width
37.11ms

$Hold = (37.11 - 13)\ mSec$
$= 24.11\ mSec.$

3 Mar 2000
13:00:48

3.2.4.36.2 Integration Time CH 11
T05-41
FINAL CPT

TEST ENG: [signature] DATE 3-3-00



Hold = (37.11 − 13) mSec
= 24.11 mSec

3.2.4.3.6.2 Integration Time CH 12

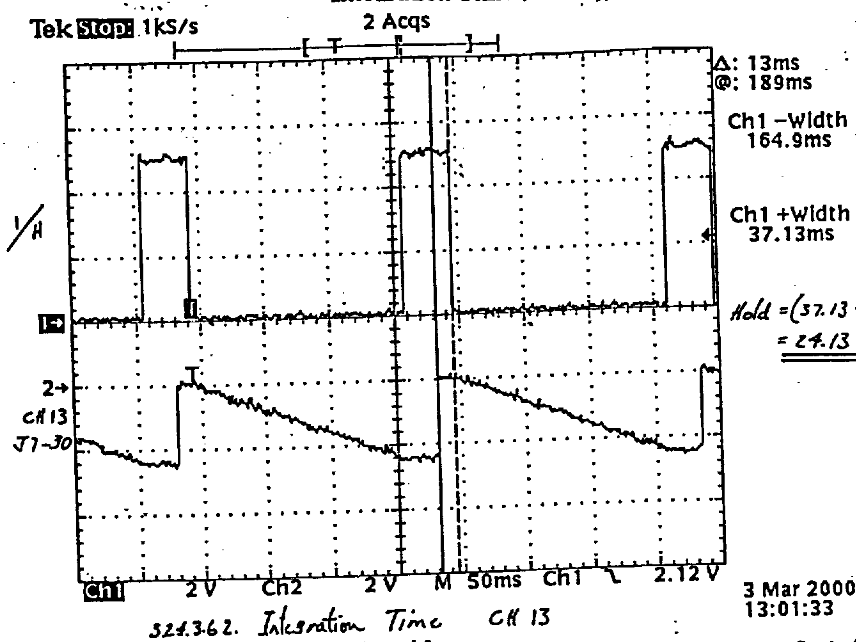
TDS-41

FINAL CPT

TEST ENG: [signature] DATE 3-7-00

TEST DATA SHEET 42

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



3.2.4.3.6.2. Integration Time CH 13

TAS-42

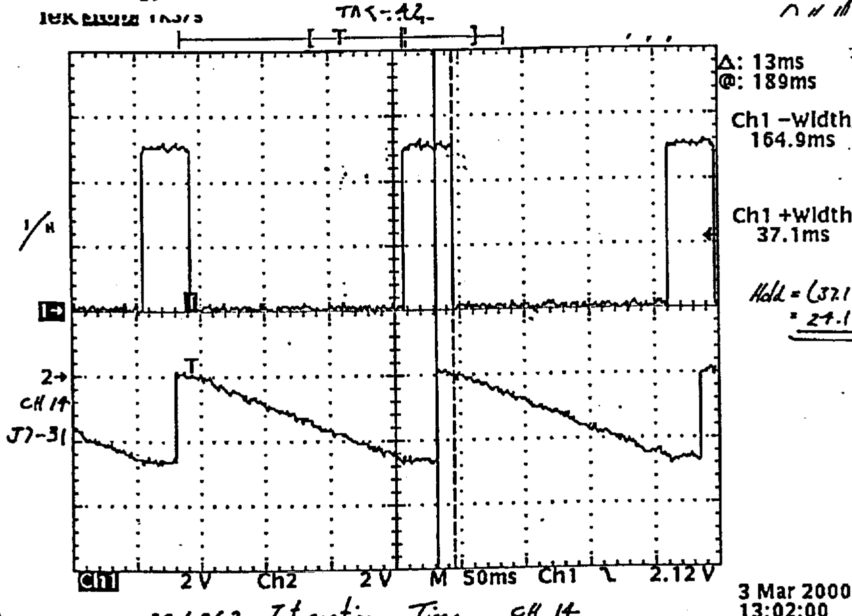
Channel 13
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms,± 10%
Pass/Fail PASS

Hold = (37.13 − 13)
= 24.13 ms

HOLD (B-D) *
Measured 24.13 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



3.2.4.3.6.2 Integration Time CH 14

Channel 14
Frequency: 57.3903 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

Hold = (37.1 − 13)
= 24.1 ms

HOLD (B-D) *
Measured 24.1 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

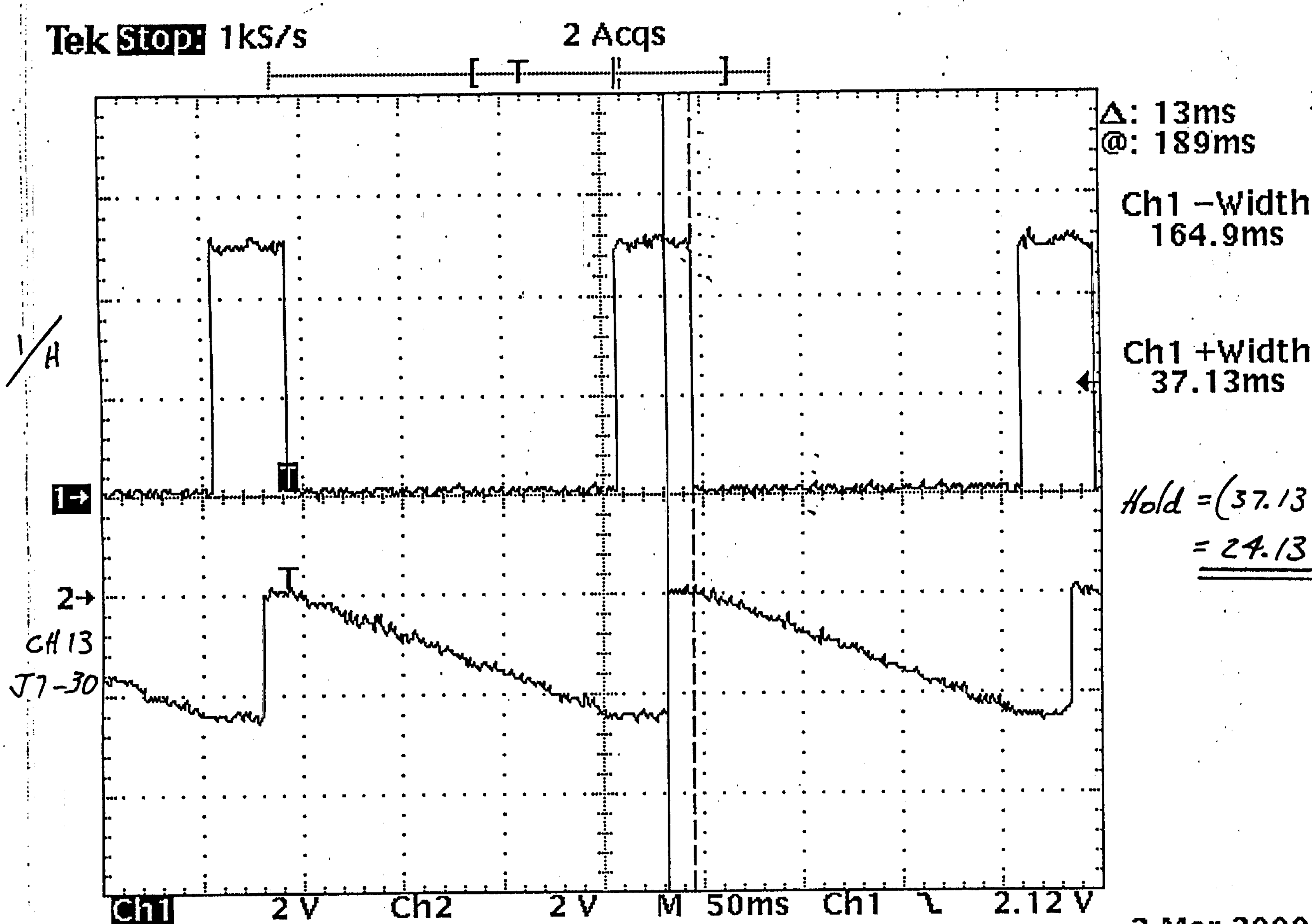
Circle Test: FINAL CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Ray Kurtzberg 3-3-00
Test Systems Engineer Date

3-4-00
Customer Representative (Flight Hardware Only) Date

7A 194
Quality Control 3-3-00
Date

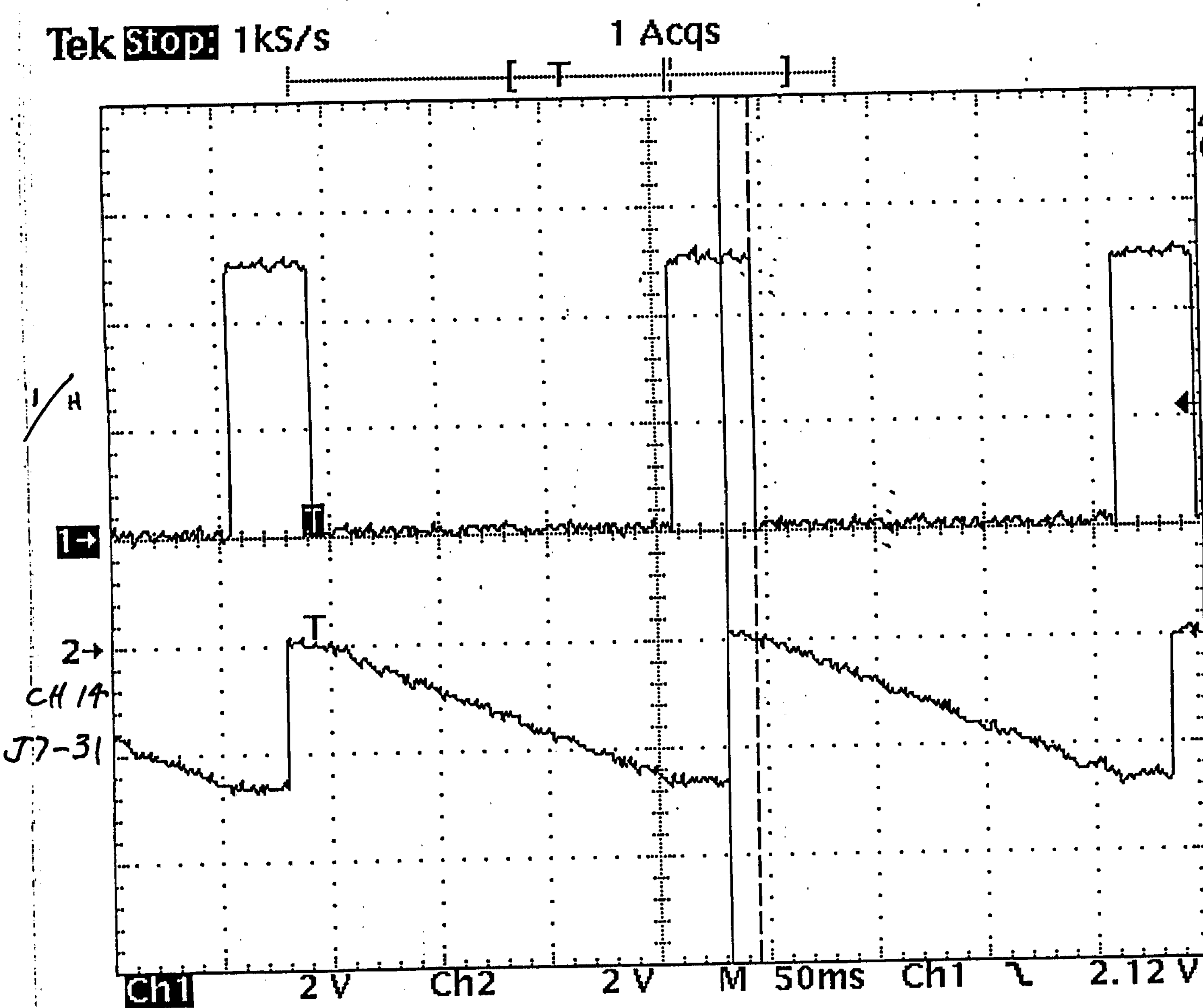


Hold = (37.13 − 13) mSec
= 24.13 mSec

3.2.4.3.6.2. Integration Time CH 13
TDS-42

FINAL CPT

TEST ENG: [signature] DATE 3-3-00



Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

Ch1 +Width
37.1ms

Hold = (37.1 − 13) m Sec
= 24.1 m Sec

3.2.4.3.6.2 Integration Time CH 14

TDS − 42

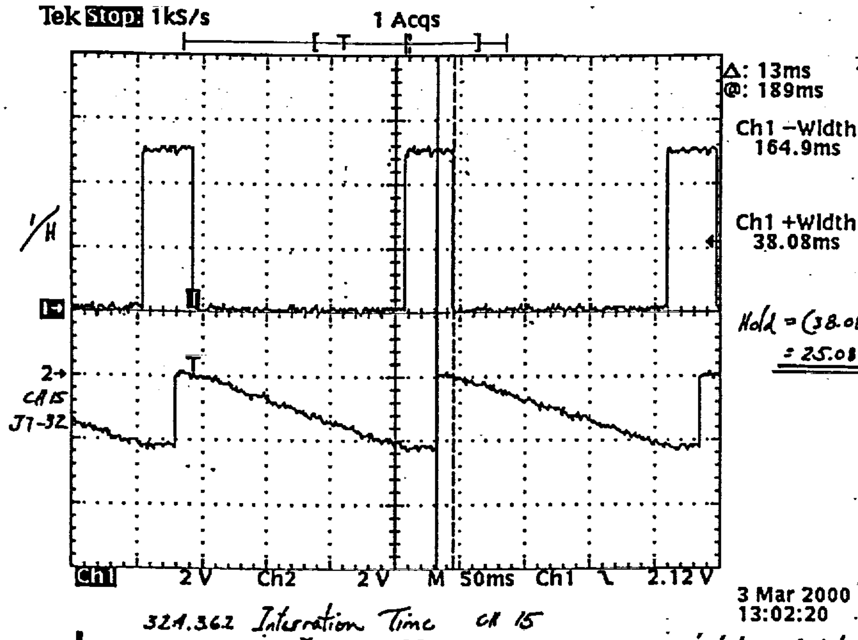
FINAL CPT

3 Mar 2000
13:02:00

TEST ENG: [signature] DATE 3-3-00

S/O: 373237 OP: 0830

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



Hold = (38.08 - 13
= 25.08 mS

Channel 15
Frequency: 89 GHz

INTEGRATION (X) *
Measured 164.9 ms
Required 165 ms ± 10%
Pass/Fail PASS

HOLD (B-D) *
Measured 25.08 ms
Required 25 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS

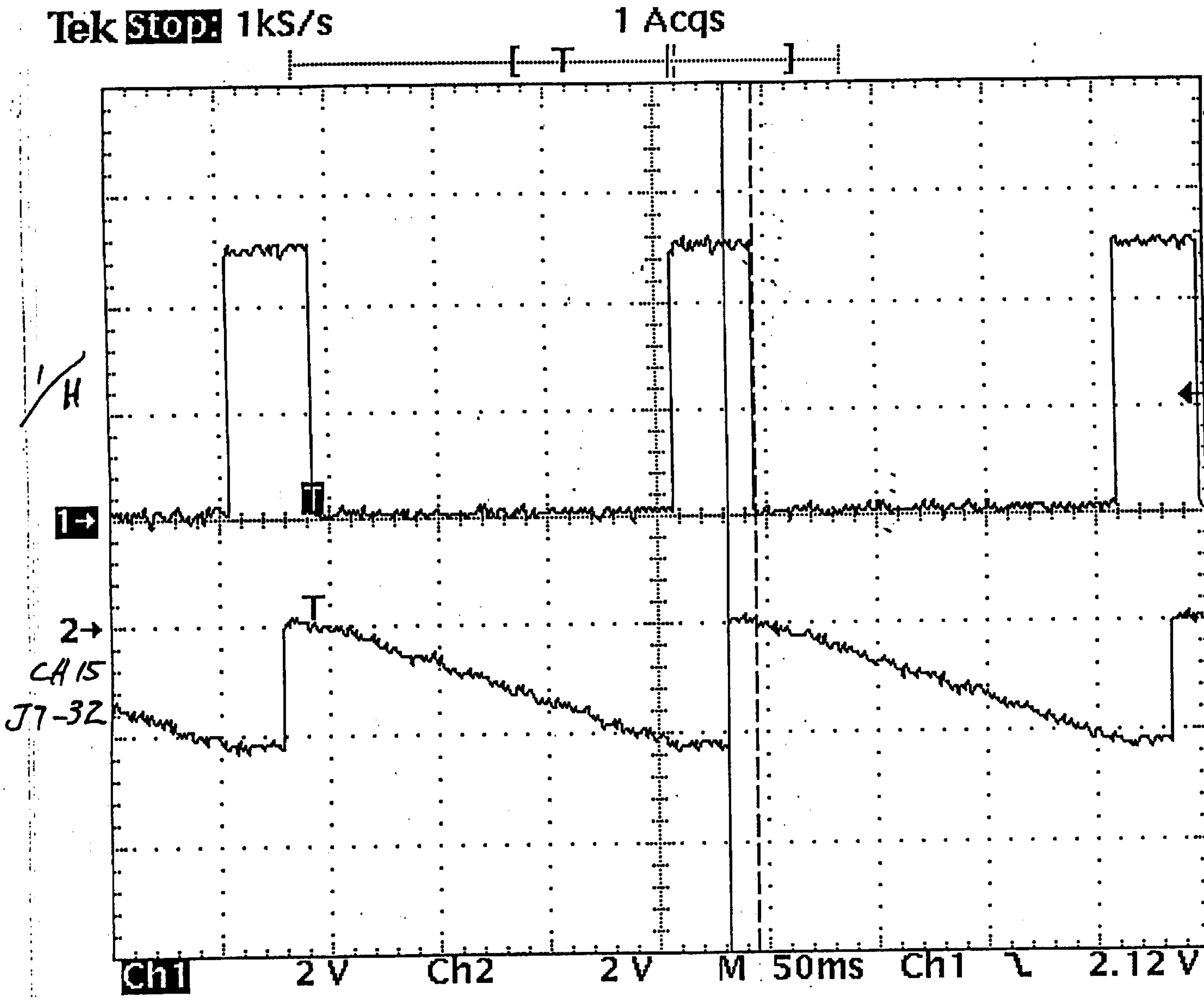
Circle Test: Final CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Test Systems Engineer 3-3-00 Date

Customer Representative (Flight Hardware Only) 3-4-00 Date

Quality Control 7A 194 3-3-00 Date



Δ: 13ms
@: 189ms

Ch1 −Width
164.9ms

Ch1 +Width
38.08ms

Hold = (38.08 − 13) msec
= 25.08 mSec

3 Mar 2000
13:02:20

324.36.2 Interration Time CH 15
TDS − 43

FINAL CPT

TEST ENG: DATE 3-3-00

TEST DATA SHEET 49
Receiver Input Signals (Paragraph 3.2.4.4.1)

CH 9 through 14 PLLO	PRT Temp (°C)		Measured * Frequency	Requirements **	Pass/ Fail
PLLO No. 1	PLO No. 1	Xtal *** Osc.			
	27.35°C		57.2903397 GHz	57290.334 MHz ± 50 kHz	PASS
PLLO No. 2	PLO No. 2	Xtal *** Osc.			
	30.42°C		57.2903213 GHz	57290.334 MHz ± 50 kHz	PASS

* Attach spectrum analyzer plots.
** = At 18°C
*** PRT not connected on S/N 105 and above.

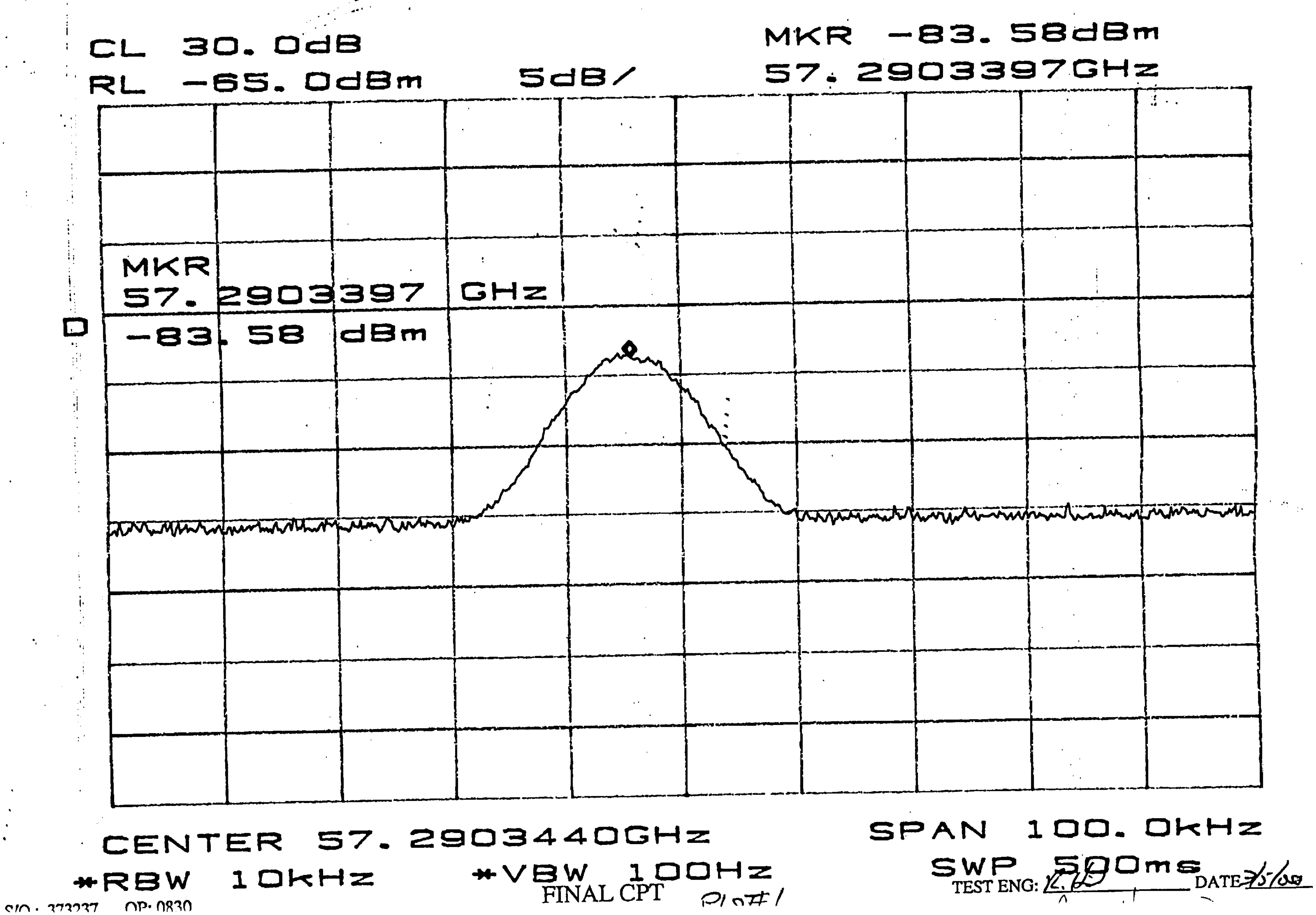
Circle Test: CPT LPT

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

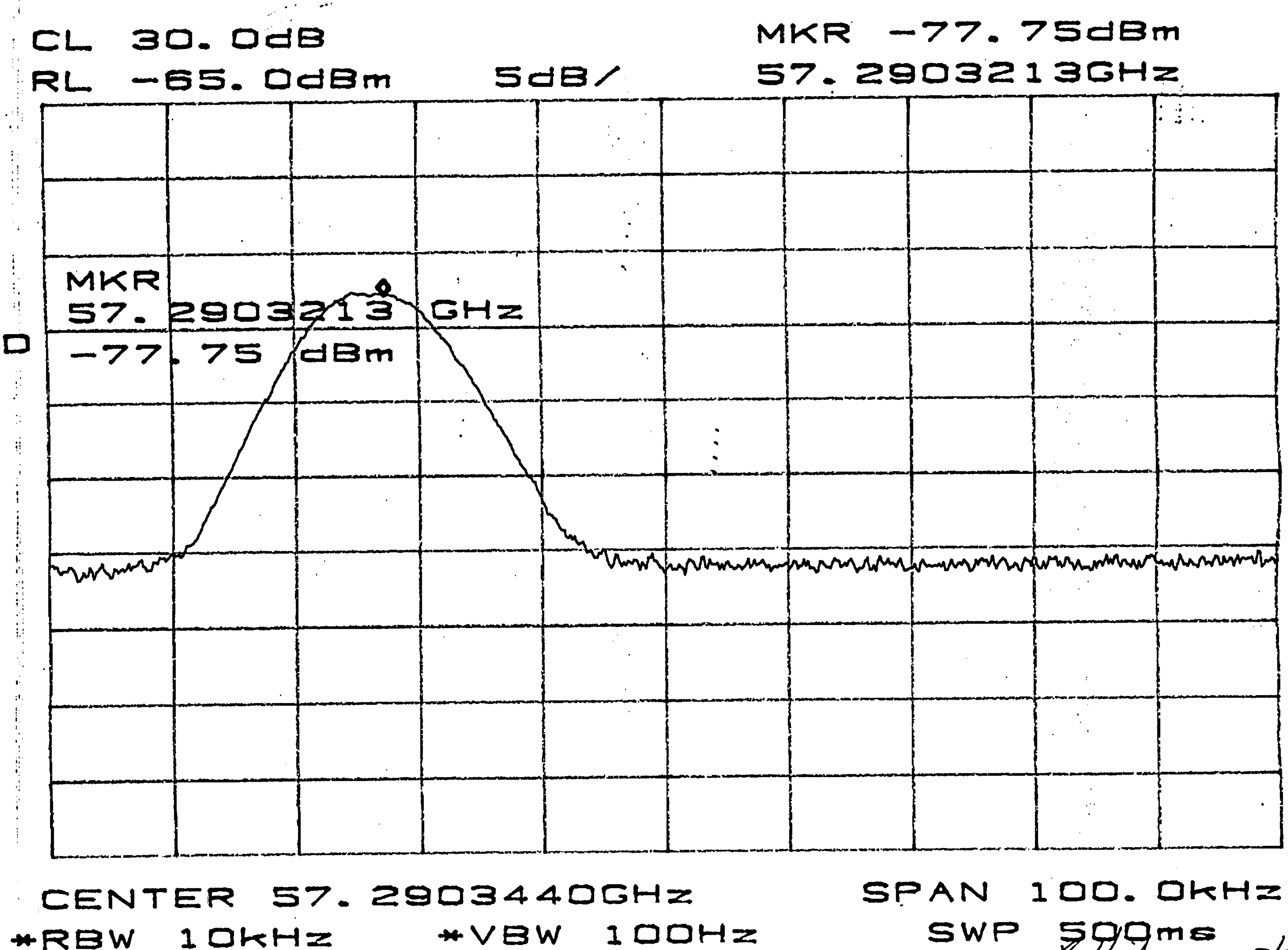
[signature] 3/5/00
Test Systems Engineer Date

[signature] DCMC 3-5-00
Customer Representative (Flight Hardware Only) Date

[signature] 3/5/00 7A 275
Quality Control Date



CL 30.0dB
RL -65.0dBm
5dB/
MKR -83.58dBm
57.2903397GHz
MKR
57.2903397 GHz
-83.58 dBm
D
CENTER 57.2903440GHz
*RBW 10kHz
*VBW 100Hz
SPAN 100.0kHz
SWP 500ms
TEST ENG:
DATE
FINAL CPT
Plot#1
S/O: 373237
OP: 0830



FINAL CPT

TEST ENG: R. Hay DATE 3/5/00

TEST DATA SHEET 50 (Sheet 1 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

Channels 3, 4, 5, 6, 7, 8, and 15. PLLO No. 1 (Channels 9 through 14)

Channel Number>	3	4	5	6
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	0.213 PASS 0.40	0.165 PASS 0.25	0.156 PASS 0.25	0.146 PASS 0.25
Channel Number>	7	8	9	10
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	0.149 PASS 0.25	0.181 PASS 0.25	0.182 PASS 0.25	0.218 PASS 0.40
Channel Number>	11	12	13	14
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	0.253 PASS 0.40	0.351 PASS 0.60	0.512 PASS 0.80	0.760 PASS 1.20
Channel Number>	15			
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	0.186 PASS 0.50			

* 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 FINAL CPT

Op. 0830

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

AMSU B BEIT

3-3-00

Test Systems Engineer Date

7A 289

04MAR00

Quality Control Date

3-4-00

Customer Representative (Flight Hardware Only) Date

A1.EXE A1 FUNCTIONAL TEST RESULTS 3-MAR-00 23:06:13

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.07	16117.0	13344.0	0.078	0.211
4	296.07	17091.0	14146.0	0.073	0.168
5	296.07	15499.0	12913.0	0.084	0.152
6	295.67	16554.0	13640.0	0.074	0.155
7	295.67	16537.0	13668.0	0.075	0.140
8	296.07	15876.0	13223.0	0.081	0.175
9	295.67	16100.0	13536.0	0.084	0.186
10	295.67	17307.0	14290.0	0.071	0.223
11	295.67	19476.0	15968.0	0.061	0.267
12	295.67	19778.0	16194.0	0.060	0.398
13	295.67	18535.0	15259.0	0.066	0.465
14	295.67	19787.0	16137.0	0.059	0.795
15	295.67	16832.0	15131.0	0.127	0.172

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

PLLO: #1
S/O 373237 Op 0830
A1 S/N 108

A1.EXE A1 FUNCTIONAL TEST RESULTS 3-MAR-00 23:07:25

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.08	16112.0	13342.0	0.078	0.207
4	296.08	17085.0	14143.0	0.073	0.153
5	296.08	15495.0	12912.0	0.084	0.148
6	295.68	16550.0	13642.0	0.074	0.153
7	295.68	16532.0	13672.0	0.075	0.145
8	296.08	15869.0	13219.0	0.082	0.193
9	295.68	16096.0	13539.0	0.084	0.177
10	295.68	17302.0	14294.0	0.072	0.205
11	295.68	19464.0	15969.0	0.062	0.276
12	295.68	19765.0	16193.0	0.060	0.325
13	295.68	18522.0	15255.0	0.066	0.486
14	295.68	19769.0	16133.0	0.059	0.739
15	295.68	16825.0	15131.0	0.127	0.203

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 3-MAR-00 23:10:53

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.09	16101.0	13337.0	0.078	0.207
4	296.09	17070.0	14137.0	0.074	0.156
5	296.09	15485.0	12907.0	0.084	0.174
6	295.68	16539.0	13658.0	0.075	0.129
7	295.68	16523.0	13690.0	0.076	0.150
8	296.09	15853.0	13209.0	0.082	0.177
9	295.68	16083.0	13550.0	0.085	0.179
10	295.68	17286.0	14307.0	0.072	0.244
11	295.68	19429.0	15970.0	0.062	0.284
12	295.68	19728.0	16198.0	0.061	0.370
13	295.68	18486.0	15255.0	0.067	0.565
14	295.68	19728.0	16129.0	0.060	0.708
15	295.68	16806.0	15134.0	0.129	0.181

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1.EXE A1 FUNCTIONAL TEST RESULTS 3-MAR-00 23:12:13

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.09	16096.0	13336.0	0.078	0.226
4	296.09	17066.0	14134.0	0.074	0.194
5	296.09	15482.0	12905.0	0.084	0.151
6	295.69	16536.0	13662.0	0.075	0.153
7	295.69	16521.0	13697.0	0.076	0.162
8	296.09	15847.0	13206.0	0.082	0.181
9	295.69	16078.0	13552.0	0.085	0.181
10	295.69	17280.0	14310.0	0.073	0.216
11	295.69	19417.0	15971.0	0.063	0.238
12	295.69	19715.0	16196.0	0.061	0.318
13	295.69	18474.0	15254.0	0.067	0.515
14	295.69	19708.0	16127.0	0.060	0.858
15	295.69	16799.0	15133.0	0.129	0.183

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1.EXE A1 FUNCTIONAL TEST RESULTS 3-MAR-00 23:13:09

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.09	16094.0	13334.0	0.078	0.213
4	296.09	17063.0	14134.0	0.074	0.157
5	296.09	15479.0	12903.0	0.084	0.156
6	295.69	16532.0	13666.0	0.075	0.141
7	295.69	16519.0	13701.0	0.077	0.148
8	296.09	15844.0	13204.0	0.082	0.181
9	295.69	16075.0	13555.0	0.086	0.186
10	295.69	17276.0	14313.0	0.073	0.201
11	295.69	19408.0	15971.0	0.063	0.199
12	295.69	19705.0	16197.0	0.061	0.343
13	295.69	18465.0	15255.0	0.067	0.531
14	295.69	19697.0	16128.0	0.060	0.699
15	295.69	16794.0	15134.0	0.130	0.191

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

AE-26156/3C
6 Apr 99

TEST DATA SHEET 50 (Sheet 2 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

PLLO No. 2 (Channels 9 through 14)

Channel Number>	9	10	11	12
NEΔT (Average of 5 data)	0.178	0.217	0.237	0.353
Pass/Fail	PASS	PASS	PASS	PASS
NEΔT (Specified) K **	0.25	0.40	0.40	0.60
Channel Number>	13	14		
NEΔT (Average of 5 data)	0.486	0.789		
Pass/Fail	PASS	PASS		
NEΔT (Specified) K **	0.80	1.20		

* 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 FINAL CPT

Op. 0830

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 373237 S/N: 108

Ken Shane AMSU 5 BEIT 3-3-00

Test Systems Engineer Date

3-4-00

Customer Representative (Flight Hardware Only) Date

Judie Hervey 7A 289 04 MAR 00

Quality Control Date

A1 FUNCTIONAL TEST RESULTS
A1.EXE 3-MAR-00 23:30:05

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.12	16050.0	13316.0	0.079	0.207
4	296.12	16999.0	14096.0	0.074	0.157
5	296.12	15440.0	12888.0	0.085	0.153
6	295.67	16482.0	13596.0	0.075	0.127
7	295.67	16485.0	13643.0	0.076	0.158
8	296.12	15781.0	13163.0	0.083	0.200
9	295.67	15654.0	13199.0	0.088	0.171
10	295.67	16811.0	13926.0	0.075	0.213
11	295.67	18931.0	15572.0	0.064	0.242
12	295.67	19211.0	15784.0	0.063	0.388
13	295.67	18004.0	14871.0	0.069	0.518
14	295.67	19175.0	15693.0	0.062	0.802
15	295.67	16720.0	15088.0	0.132	0.172

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

PLLO #2
S/O 373237 Op. 0830
A1 S/N 108

A1.EXE A1 FUNCTIONAL TEST RESULTS 3-MAR-00 23:31:33

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.13	16046.0	13312.0	0.079	0.204
4	296.13	16995.0	14093.0	0.074	0.143
5	296.13	15437.0	12885.0	0.085	0.162
6	295.67	16478.0	13603.0	0.075	0.140
7	295.67	16482.0	13652.0	0.076	0.157
8	296.13	15777.0	13160.0	0.083	0.183
9	295.67	15648.0	13204.0	0.088	0.172
10	295.67	16805.0	13932.0	0.075	0.199
11	295.67	18921.0	15577.0	0.064	0.235
12	295.67	19200.0	15787.0	0.063	0.349
13	295.67	17994.0	14875.0	0.069	0.502
14	295.67	19161.0	15694.0	0.062	0.747
15	295.67	16715.0	15091.0	0.133	0.179

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 3-MAR-00 23:32:37

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.14	16043.0	13314.0	0.079	0.210
4	296.14	16991.0	14094.0	0.075	0.170
5	296.14	15436.0	12885.0	0.085	0.150
6	295.66	16475.0	13609.0	0.075	0.141
7	295.66	16479.0	13659.0	0.076	0.161
8	296.14	15774.0	13160.0	0.083	0.204
9	295.66	15644.0	13209.0	0.089	0.197
10	295.66	16800.0	13938.0	0.075	0.217
11	295.66	18914.0	15581.0	0.065	0.218
12	295.66	19192.0	15792.0	0.063	0.359
13	295.66	17987.0	14879.0	0.069	0.461
14	295.66	19152.0	15701.0	0.062	0.789
15	295.66	16711.0	15095.0	0.133	0.184

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1.EXE A1 FUNCTIONAL TEST RESULTS
3-MAR-00 23:33:41

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.14	16041.0	13311.0	0.079	0.235
4	296.14	16988.0	14089.0	0.075	0.159
5	296.14	15433.0	12882.0	0.085	0.150
6	295.66	16472.0	13612.0	0.075	0.133
7	295.66	16479.0	13663.0	0.077	0.145
8	296.14	15770.0	13156.0	0.083	0.168
9	295.66	15641.0	13211.0	0.089	0.176
10	295.66	16796.0	13940.0	0.076	0.237
11	295.66	18906.0	15582.0	0.065	0.241
12	295.66	19185.0	15794.0	0.064	0.340
13	295.66	17980.0	14880.0	0.070	0.476
14	295.66	19141.0	15699.0	0.063	0.891
15	295.66	16707.0	15094.0	0.134	0.192

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 3-MAR-00 23:34:45

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.14	16038.0	13312.0	0.079	0.213
4	296.14	16985.0	14088.0	0.075	0.159
5	296.14	15432.0	12882.0	0.085	0.170
6	295.66	16468.0	13614.0	0.076	0.151
7	295.66	16476.0	13666.0	0.077	0.156
8	296.14	15767.0	13155.0	0.083	0.159
9	295.66	15637.0	13212.0	0.089	0.175
10	295.66	16792.0	13943.0	0.076	0.219
11	295.66	18899.0	15583.0	0.065	0.250
12	295.66	19176.0	15794.0	0.064	0.330
13	295.66	17972.0	14883.0	0.070	0.472
14	295.66	19133.0	15699.0	0.063	0.714
15	295.66	16704.0	15096.0	0.134	0.176

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

TEST DATA SHEET 1 (Sheet ~~3~~ 2 of ~~4~~ 3)
3.4.5: CE01/CE03 Test Ref. CURRENT RIPPLE TEST

280ct99 QC 229 10/29/99

Test Setup Verified: Ren Shane AMSU B 3211
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date
Spectrum Analyzer	HP	8566B	54861	4-5-99	11-5-99
Current Probe	Sil Tech	91550-2B	L509571	4-23-99	11-8-99
Amplifier	HP	8447F OPT H64	C200230	9-15-99	9-15-01
Computer	HP	9836	46134-15	CNR	CNR
Plotter	HP	7475A	47417	CNR	CNR
Printer	HP	2671G	67202	CNR	CNR

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (DM) Frequency Domain 28Oct99 QC 229 10/29/99

Step	Power Line	Band	Required	Emissions within limits? Yes	No	Mode Comments/ Observations Plot
4	+28V Main Bus	Narrow	See Figures 2 & 3	✓		Full Scan 2
~~4~~	~~28V Main Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3	✓		Full Scan 12; Inst "Off" 8 & 10
~~7~~	~~28V Telemetry Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e			
7	+28V PLB	Narrow	See Figures 2 & 3	✓		Warm Cal 4
~~7~~	~~28V PLB Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e			
7	+10V Interface Bus	Narrow	See Figures 2 & 3	✓		Full Scan 6
~~7~~	~~10V Interface Bus Ret~~	~~Narrow~~	~~See Figures 2 & 3~~ e			
~~7~~	~~Safety Heater~~	~~Narrow~~	~~See Figure 4~~ e			
~~7~~	~~Safety Heater Return~~	~~Narrow~~	~~See Figure 4~~ e			

280ct99 N/R QC 229 10/29/99

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Unit AMSU-A1 1331720-2

Serial No. 108

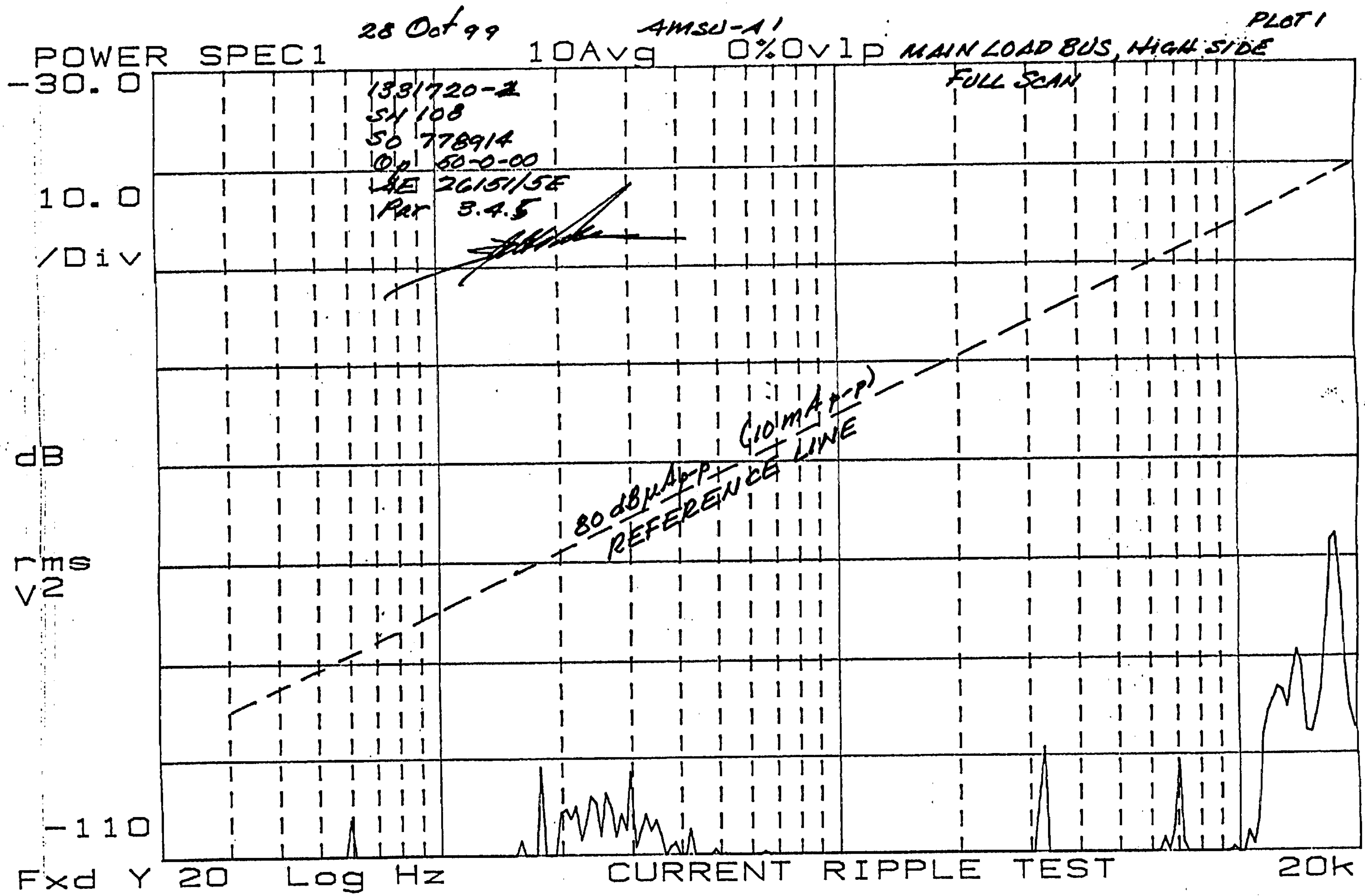
Shop Order 778914 Oper 50-0-00

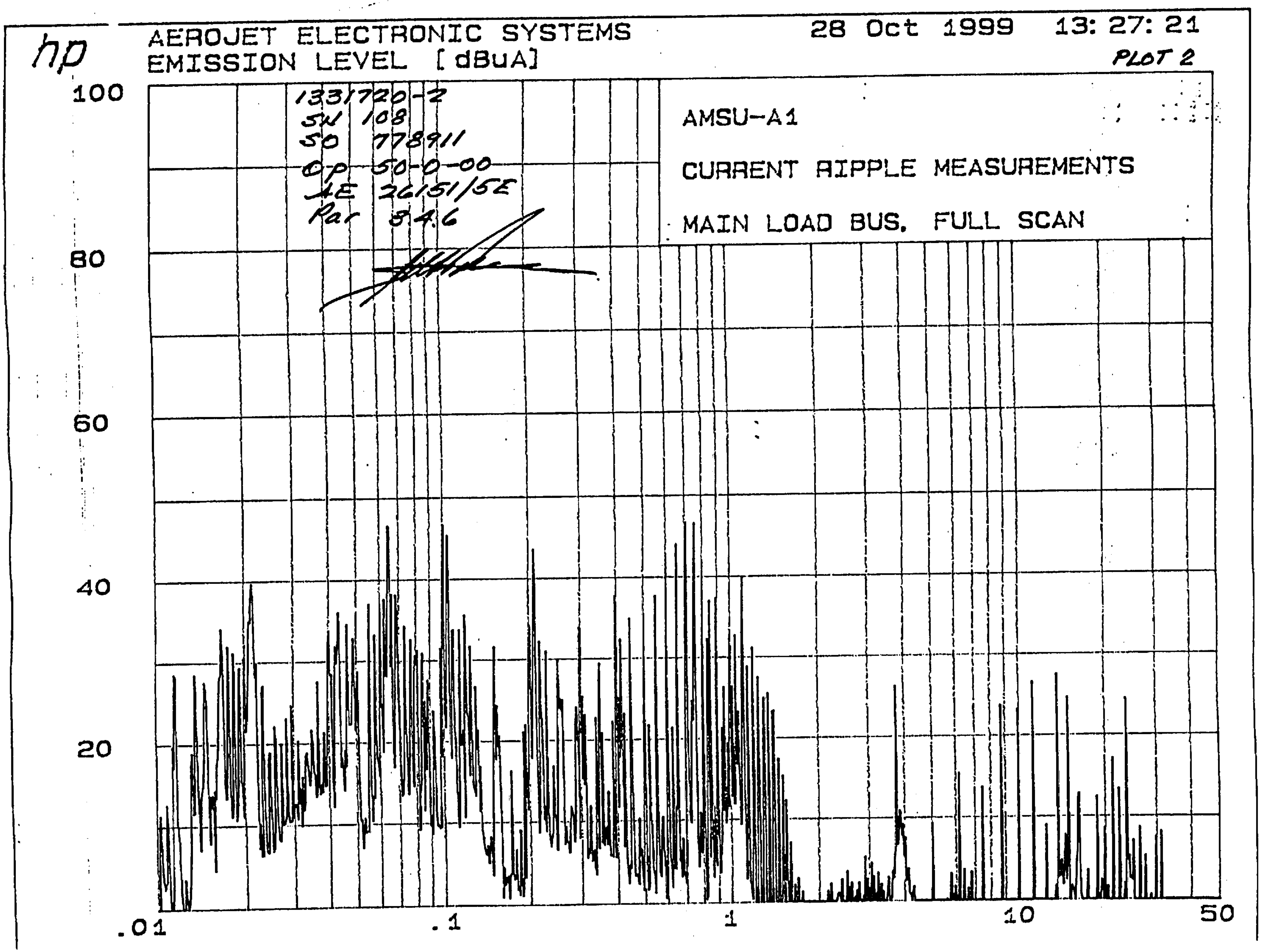
Signature/Date

Engineer: 29Oct99

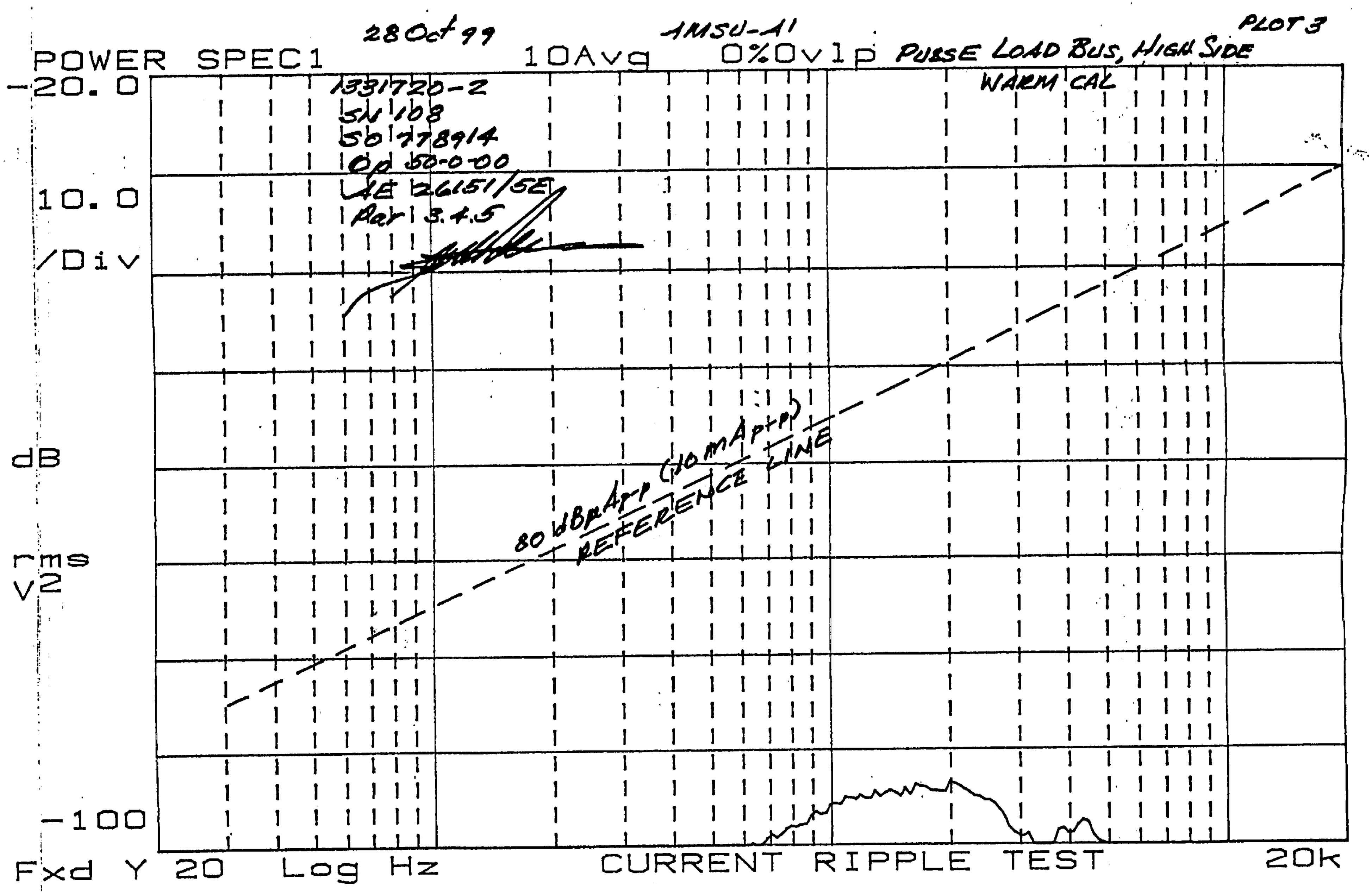
Quality Control: Judy Harvey 29 Oct 99

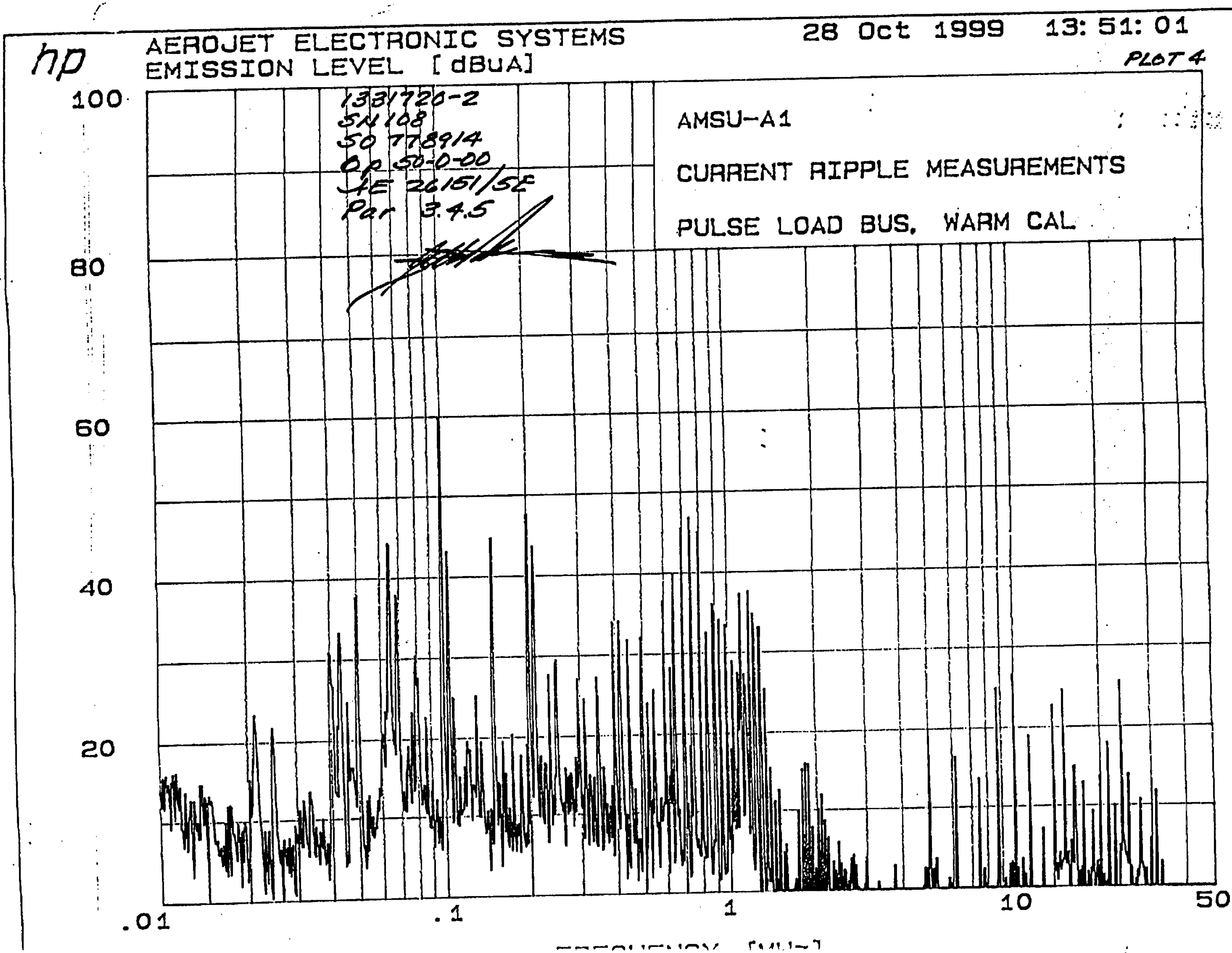
Customer Representative: 11-01-99


28 Oct 99
AMSU-A1
PLOT 1
POWER SPEC1
10Avg
0%Ovlp
MAIN LOAD BUS, HIGH SIDE
FULL SCAN
-30.0
10.0
/Div
dB
rms
V2
-110
1331720-2
SH 108
SO 778914
Op 50-0-00
LE 26151/5E
Par 3.4.5
80 dBμAp-p (10 mA p-p)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k

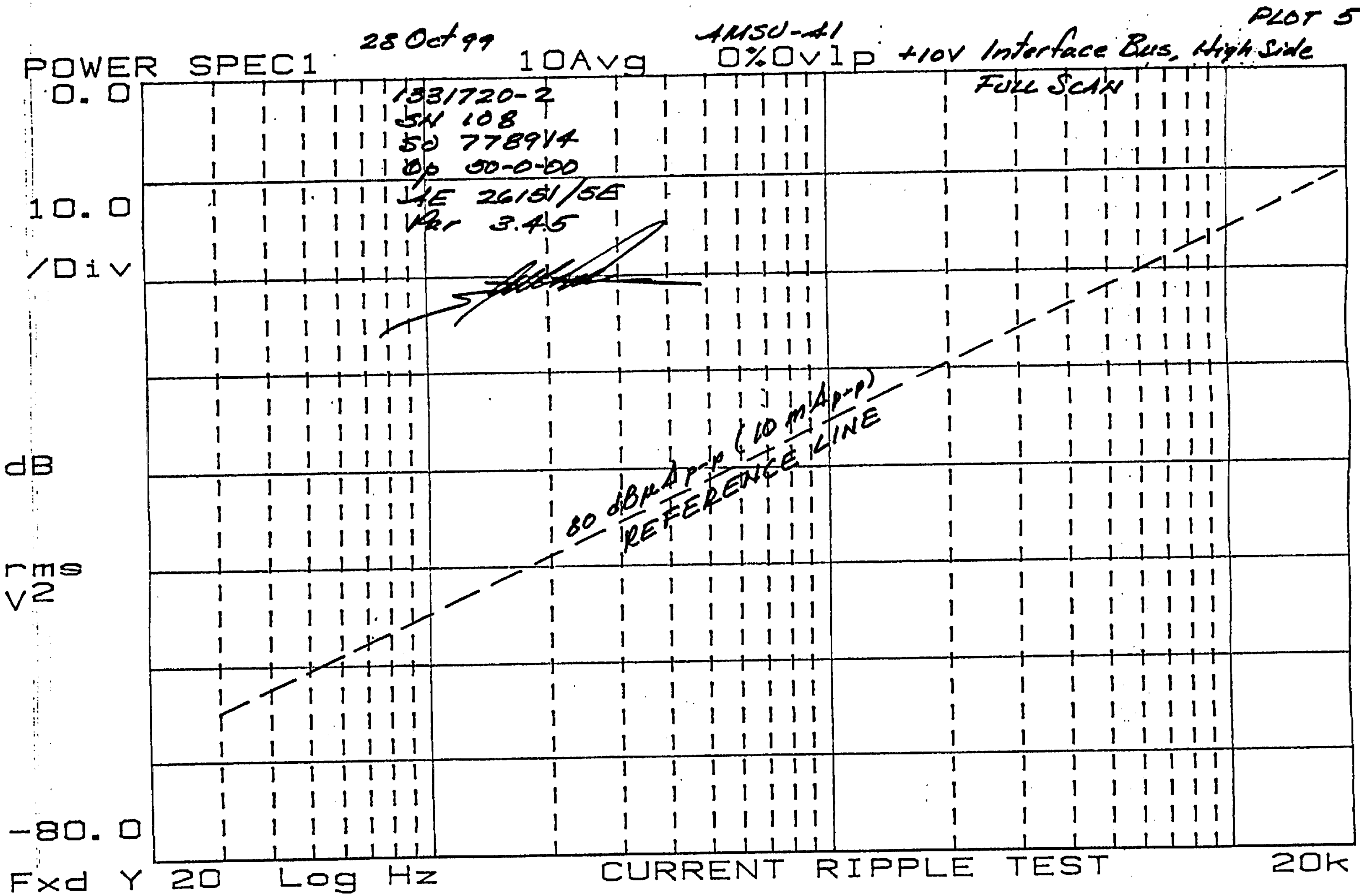


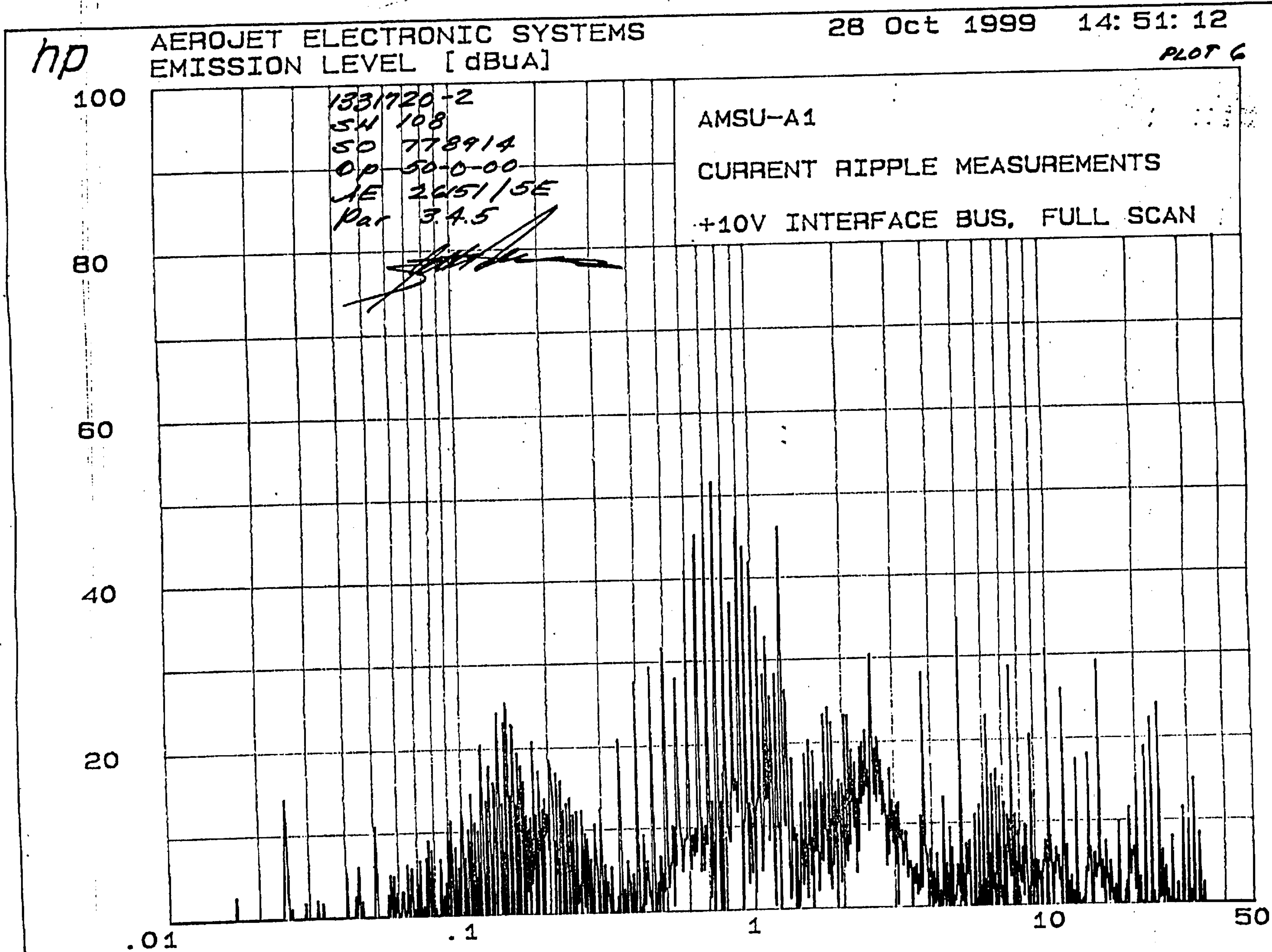
hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 13: 27: 21
PLOT 2
1331720-2
SN 108
SO 778911
OP 50-0-00
AE 26151/5E
Par 8.4.6
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
MAIN LOAD BUS. FULL SCAN
100
80
60
40
20
.01
.1
1
10
50

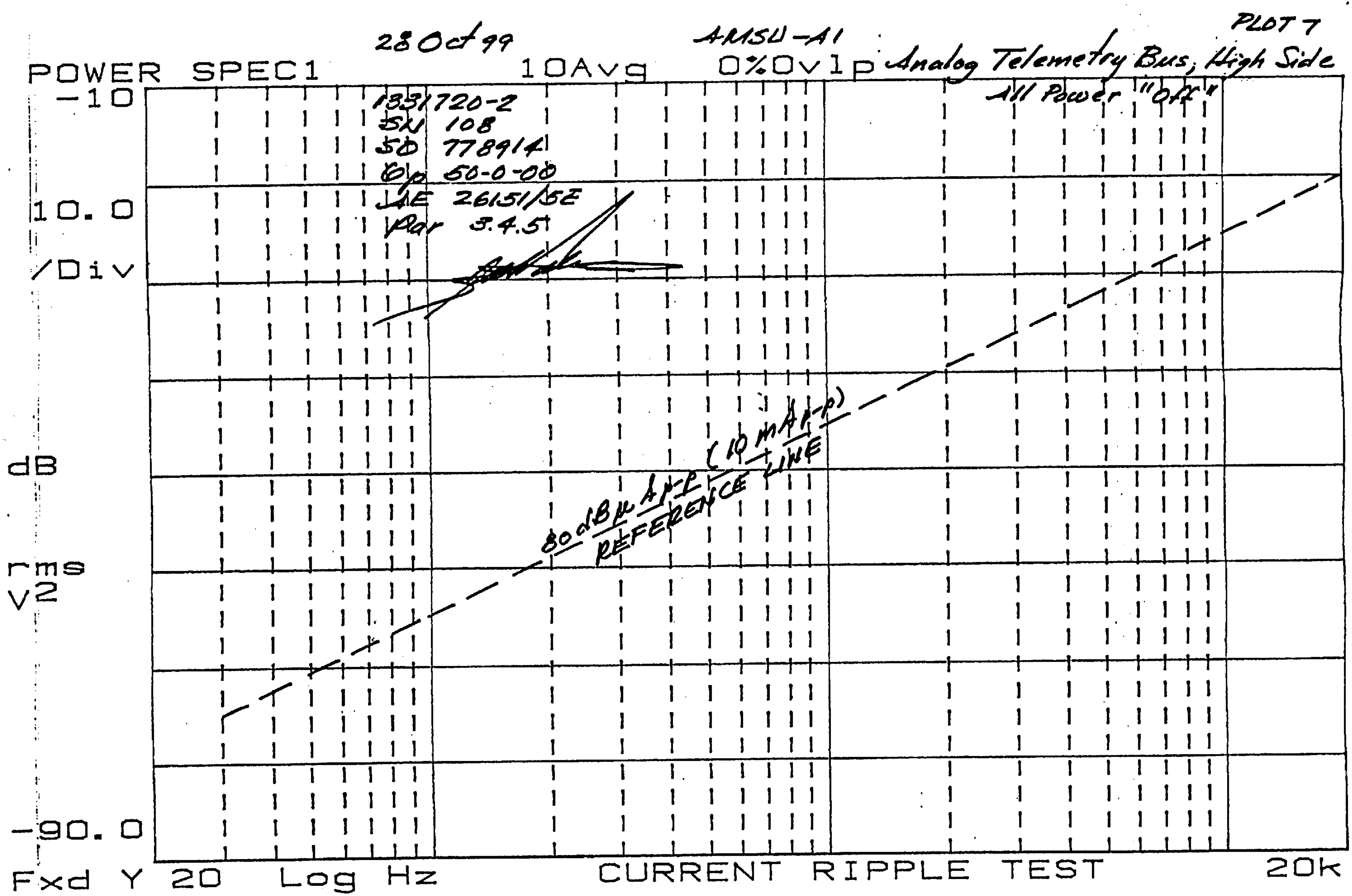

28 Oct 99
AMSU-A1
PLOT 3
POWER SPEC1
10Avg
0%Ovlp
PULSE LOAD BUS, HIGH SIDE
WARM CAL
1331720-2
SN 108
50778914
Op 50-0-00
UE 26151/5E
Par 3.4.5
-20.0
10.0
/Div
dB
rms
V2
-100
80 dBpApp (10 mApp)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k

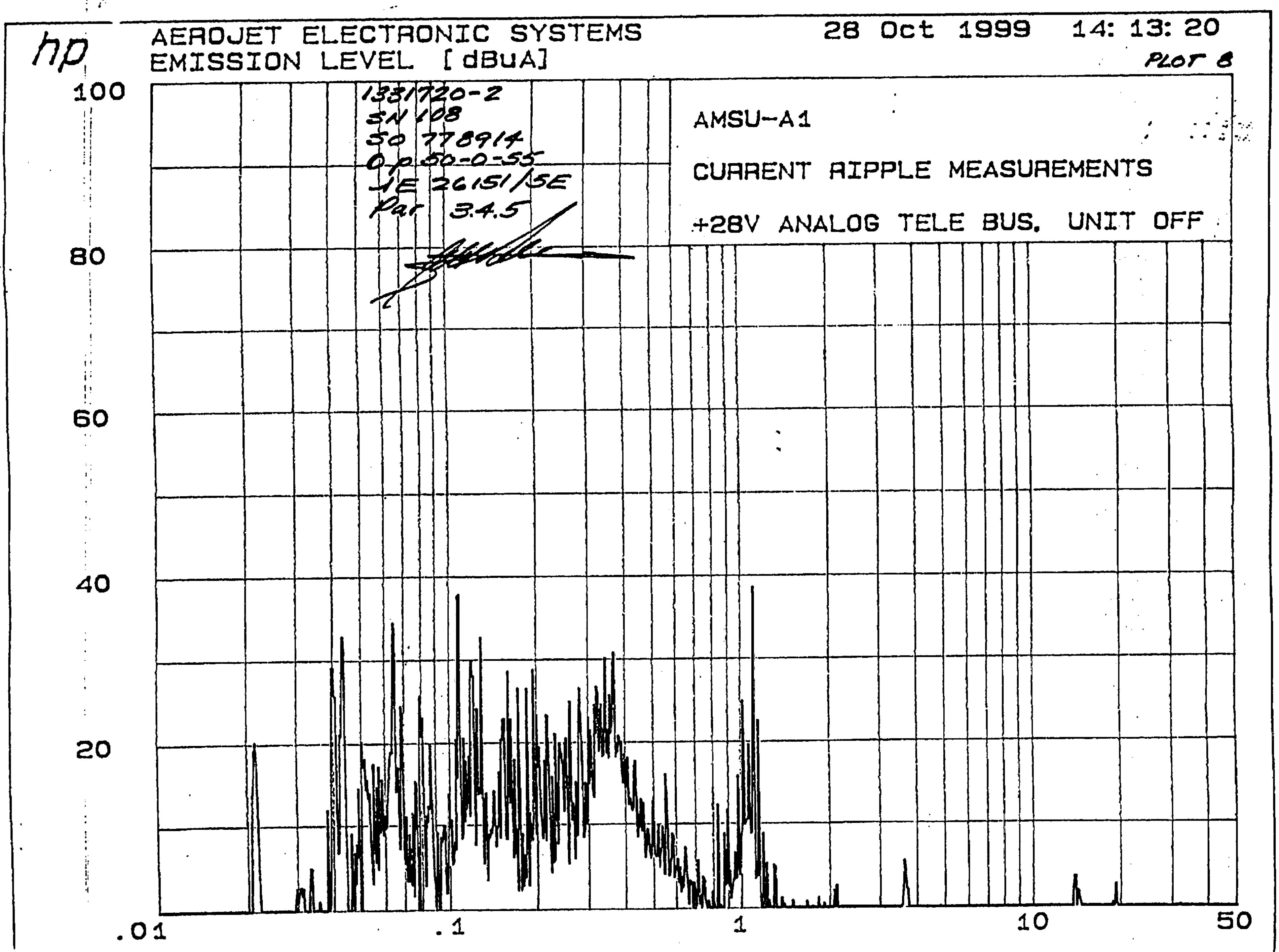


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 13: 51: 01
PLOT 4
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
PULSE LOAD BUS, WARM CAL
100
80
60
40
20
.01
.1
1
10
50

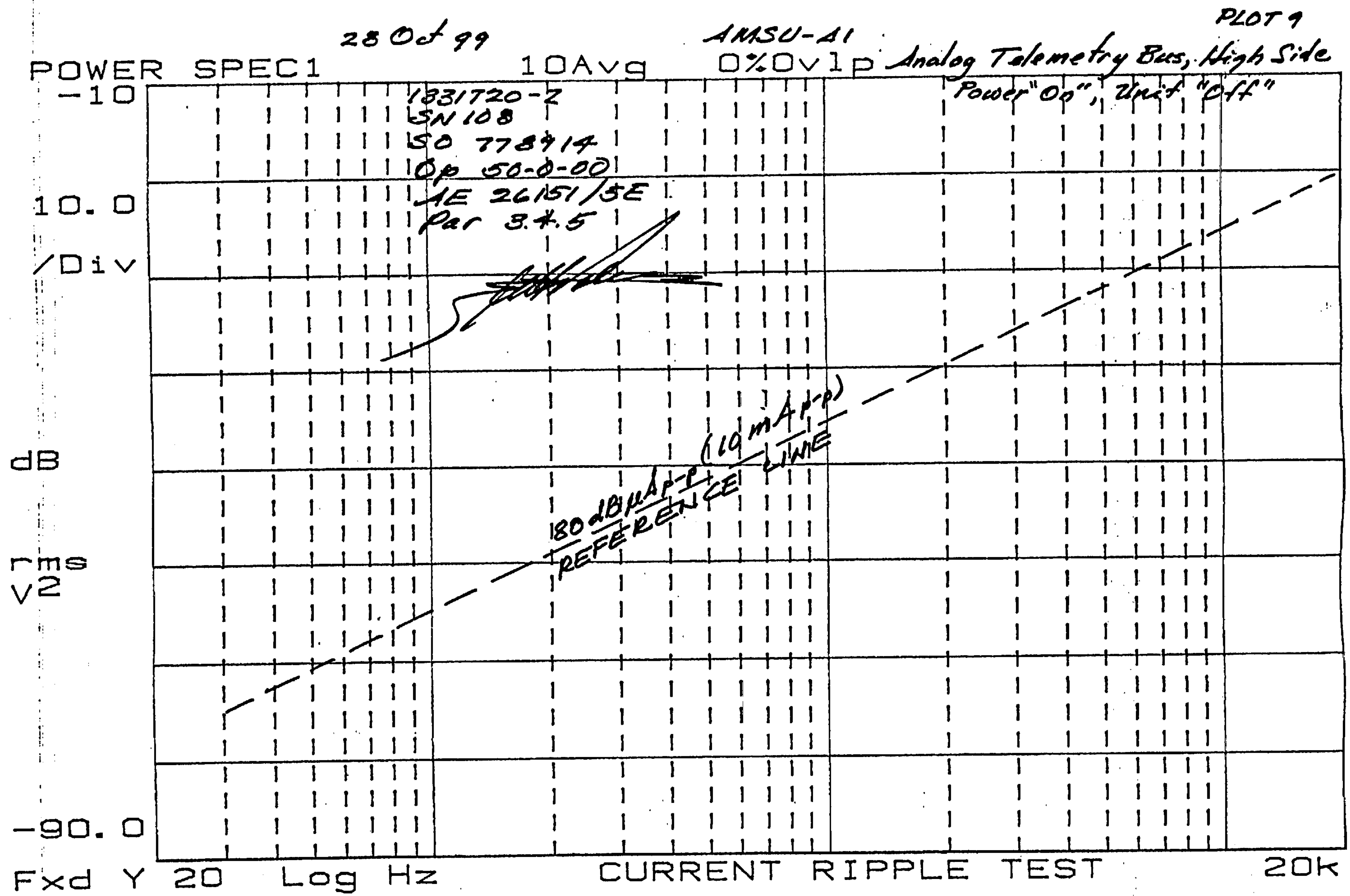

PLOT 5
28 Oct 99
AMSU-A1
POWER SPEC1
10Avg
0%0vlp
+10V Interface Bus, High Side
FULL SCAN
1331720-2
SN 108
SO 778914
Op 50-0-00
QE 26151/SE
Par 3.4.5
0.0
10.0
/Div
dB
rms
V2
-80.0
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k
80 dBμAp-p (10 mAp-p)
REFERENCE LINE

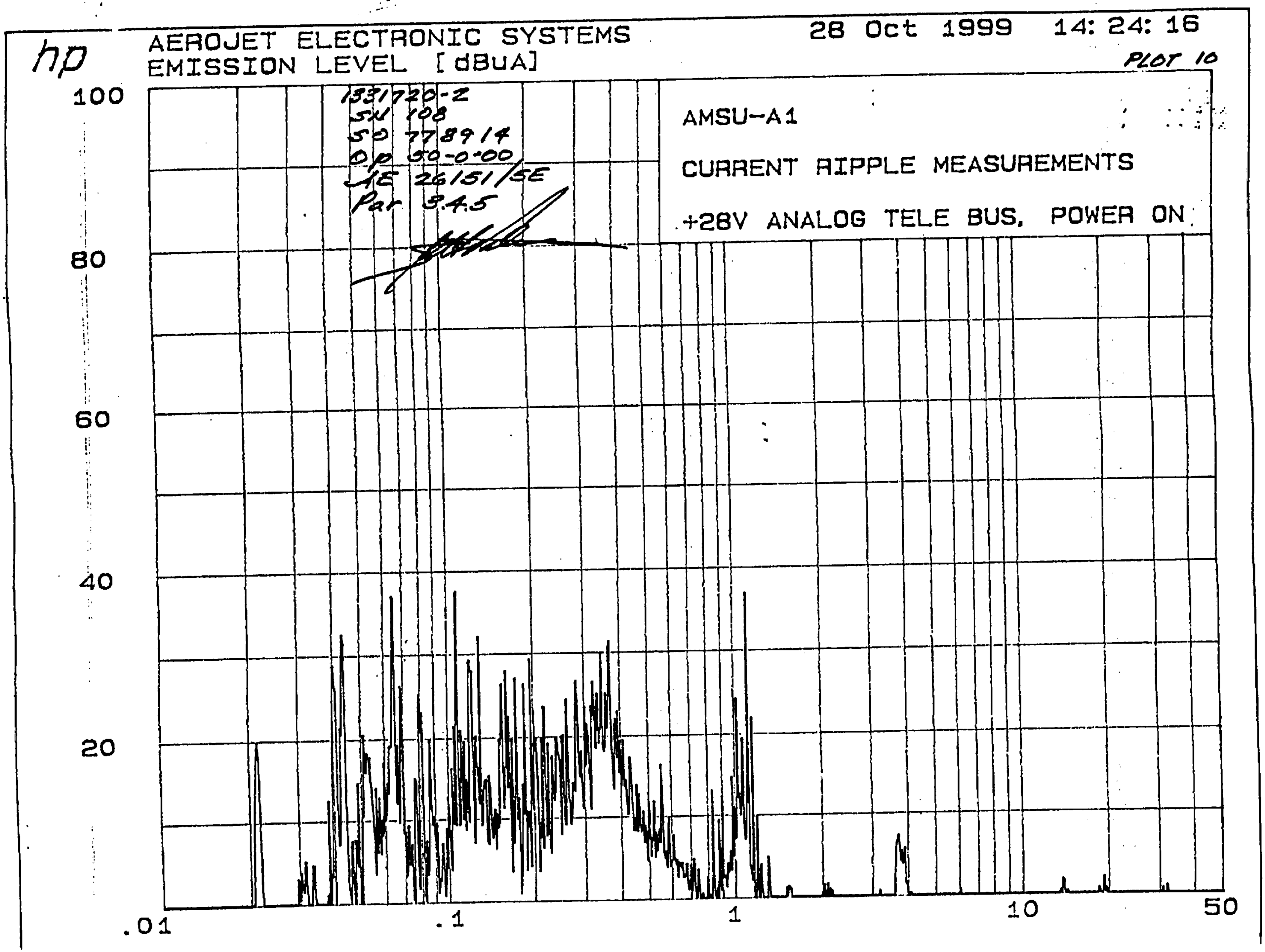

hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 14: 51: 12
PLOT 6
1331720-2
SN 108
SO 778914
OP 50-0-00
AE 2651/5E
Par 3.4.5
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
+10V INTERFACE BUS, FULL SCAN
100
80
60
40
20
.01
.1
1
10
50


PLOT 7
28 Oct 99
AMSU-A1
Analog Telemetry Bus, High Side
All Power "Off"
POWER SPEC1
10Avg
0%Ovlp
-10
10.0
/Div
dB
rms
V2
-90.0
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k
1331720-2
SN 108
SO 778914
Op 50-0-00
QE 26151/SE
Par 3.4.5
80 dBμAp-p (10 mAp-p)
REFERENCE LINE

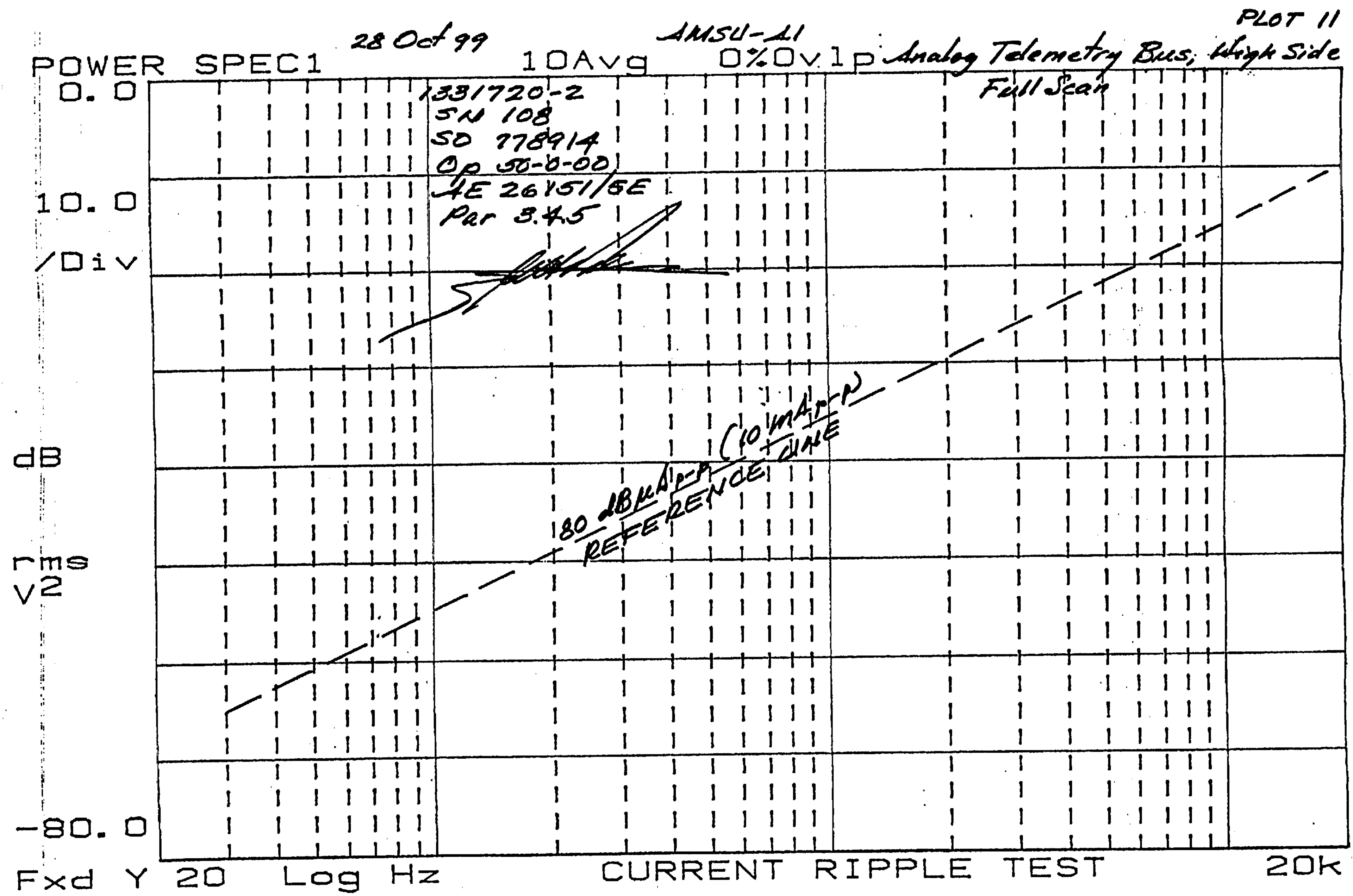


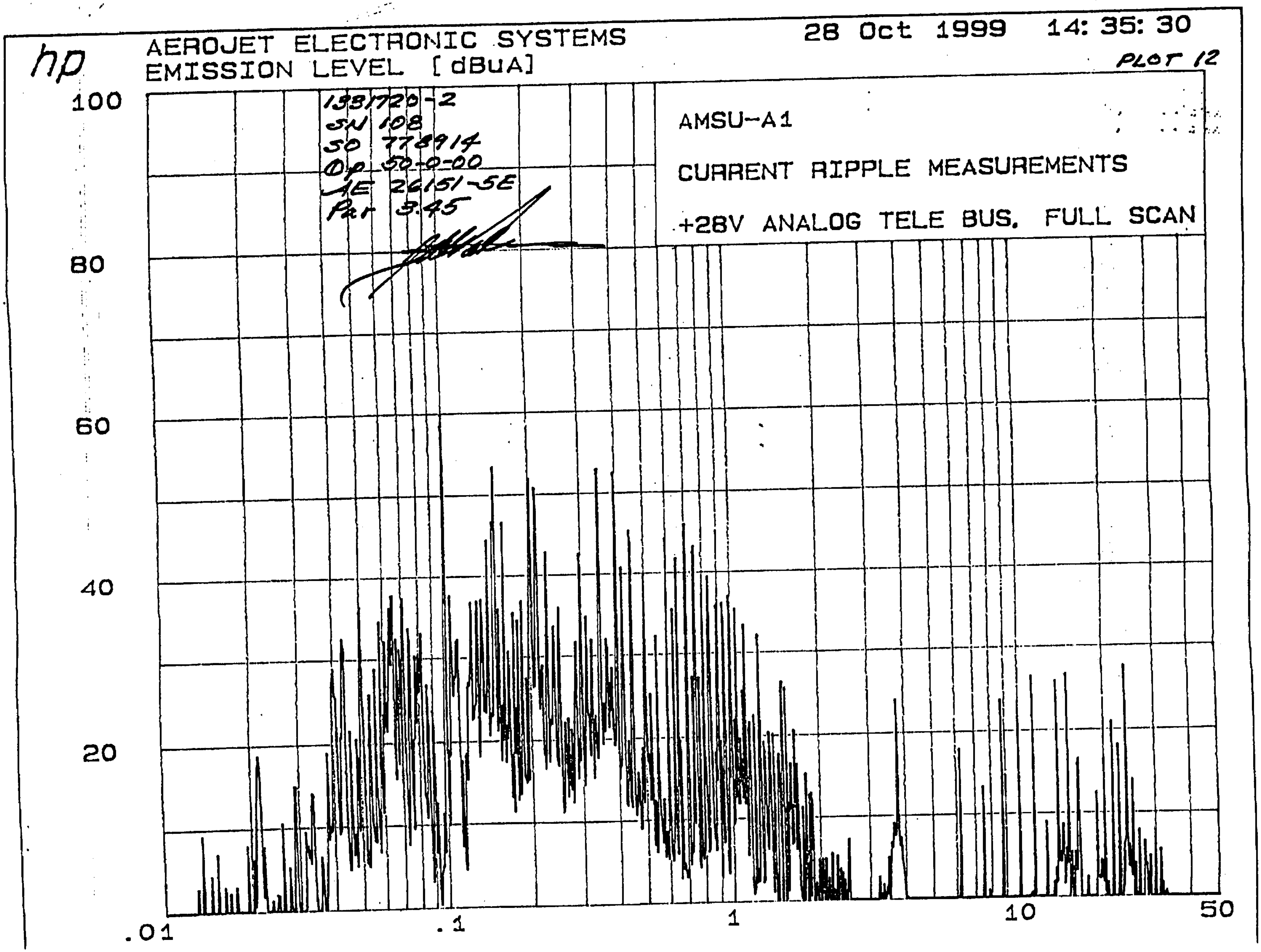
hp
AERoJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 14: 13: 20
PLOT 8
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
+28V ANALOG TELE BUS, UNIT OFF
1331720-2
SN 108
SO 778914
O.P. 50-0-55
JE 26151/5E
Par 3.4.5
100
80
60
40
20
.01
.1
1
10
50


PLOT 9
28 Oct 99
AMSU-A1
POWER SPEC1
10Avg
0%Ovlp
Analog Telemetry Bus, High Side
Power "On", Unit "Off"
1331720-2
SN 108
SO 778414
Op 50-0-00
AE 26151/5E
Par 3.4.5
-10
10.0
/Div
dB
rms
V2
-90.0
180 dBμAp-p (10 mAp-p)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k

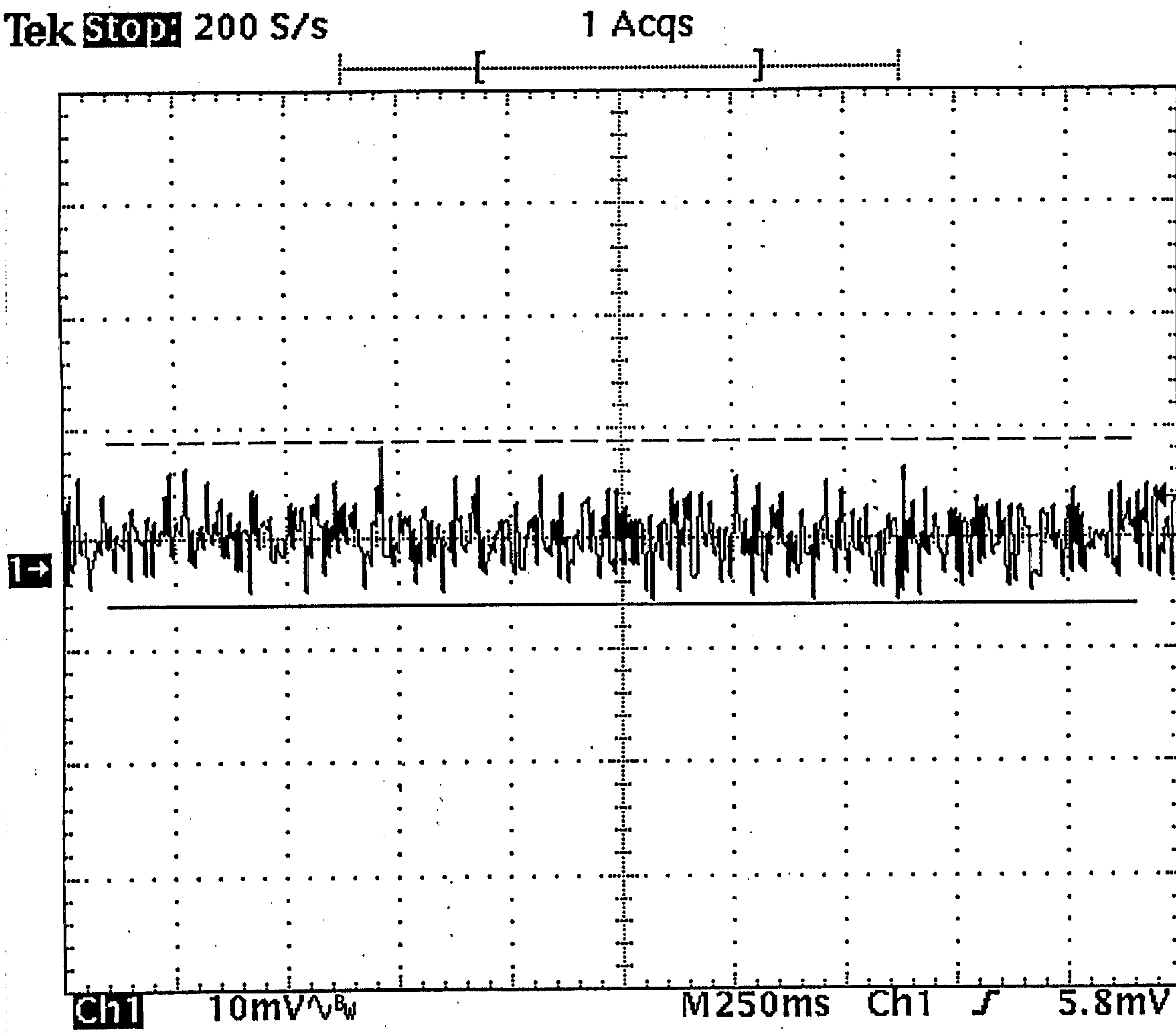


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 14: 24: 16
PLOT 10
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
+28V ANALOG TELE BUS, POWER ON
1331720-2
SN 108
SO 778914
O/P 50-0-00
AE 26151/SE
Par 3.4.5
100
80
60
40
20
.01
.1
1
10
50


PLOT 11
28 Oct 99
AMSU-A1
POWER SPEC1
10Avg
0%Ovlp
Analog Telemetry Bus; High Side
Full Scan
1331720-2
SN 108
SO 778914
Op 50-6-00
AE 26151/5E
Par 3.4.5
0.0
10.0
/Div
dB
rms
V2
-80.0
80 dBμAp-p (10 mAp-p)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k



hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
28 Oct 1999 14: 35: 30
PLOT 12
AMSU-A1
CURRENT RIPPLE MEASUREMENTS
+28V ANALOG TELE BUS. FULL SCAN
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151-5E
Par 3.45
100
80
60
40
20
.01
.1
1
10
50



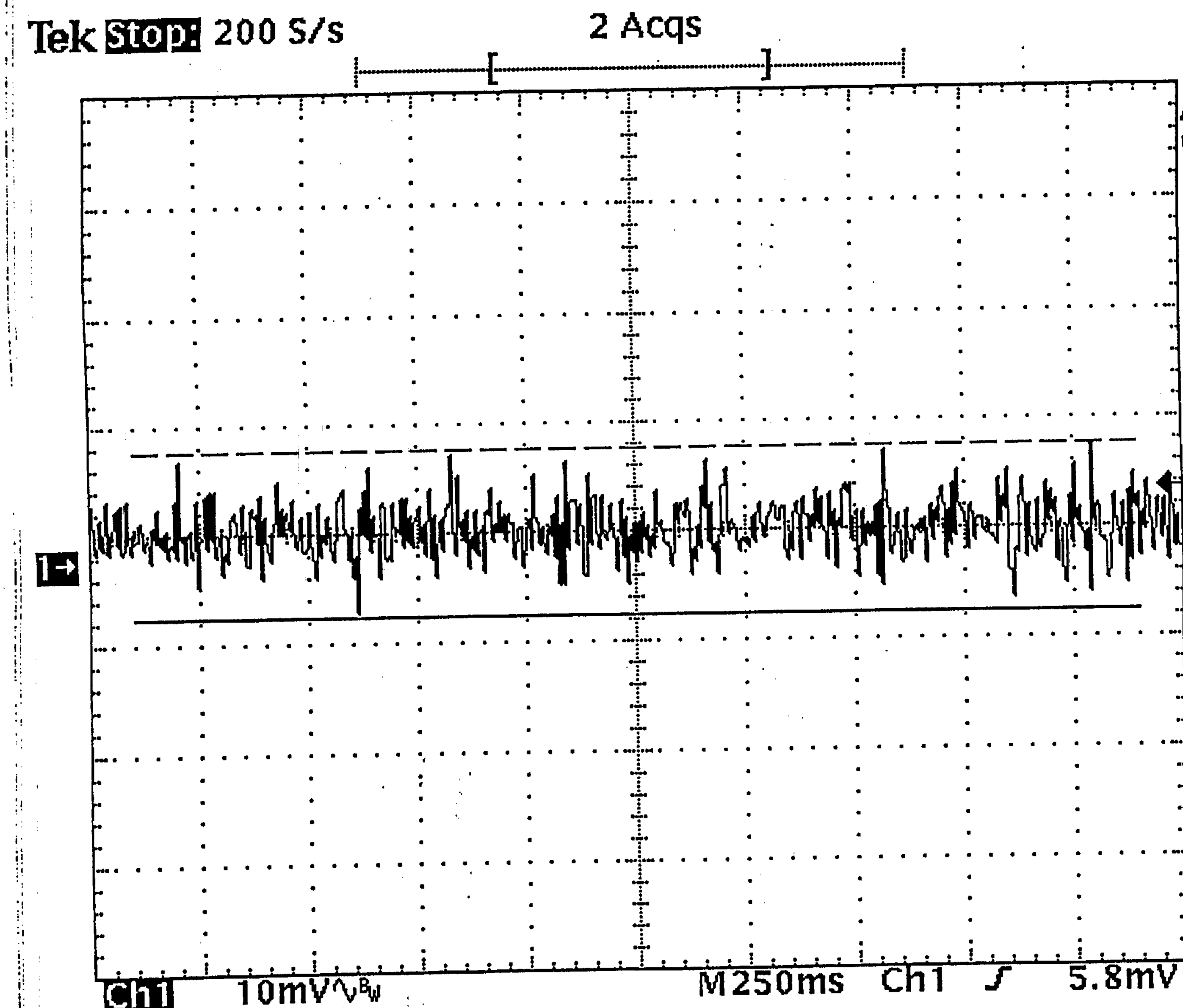
PLOT 13

Δ: 14.8mV
@: −3.6mV

Main Load Bus
All Power "Off"
CP Amp: 1mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
SE 26151/6E
Par 3.4.5

28 Oct 1999
13:20:34



PLOT 14

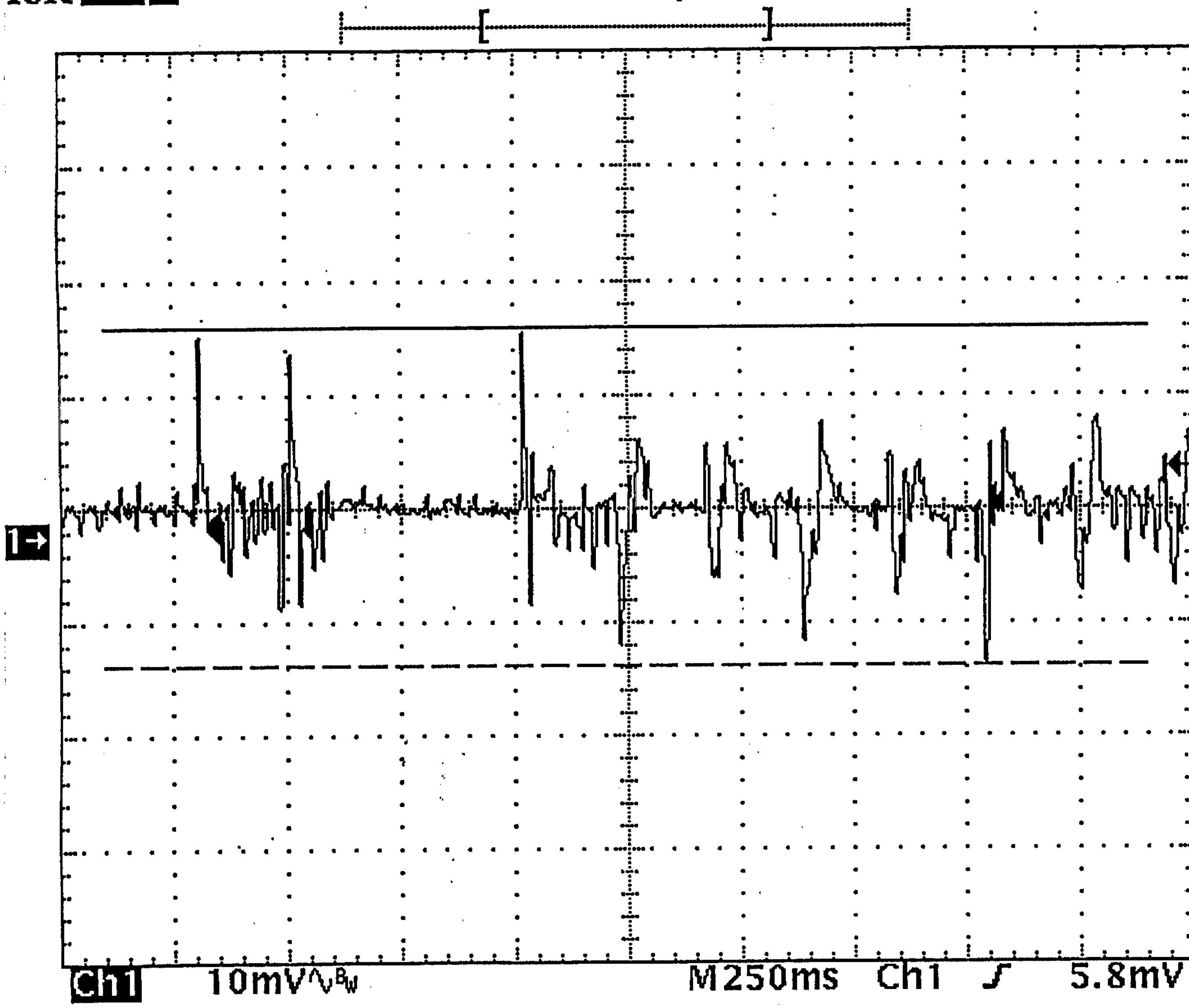
Δ: 15.2mV
@: −5.2mV

Main Load Bus
Power to Unit "On"
CP Amp: 1 mA/Div.

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
13:23:17

Tek Stop: 200 S/s 3 Acqs



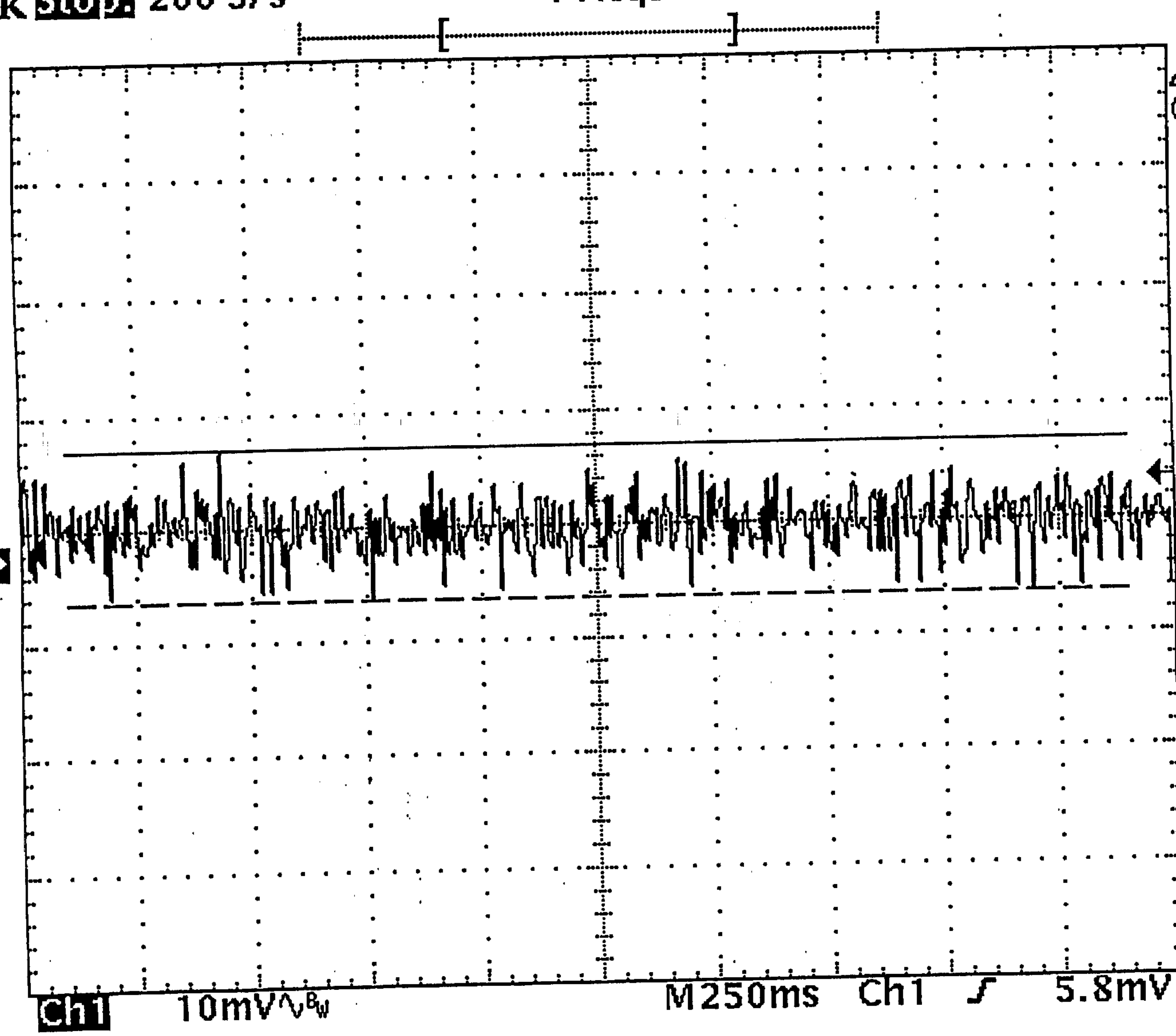
PLOT 15

Δ: 29.8mV
@: 18.4mV
Main Load Bus
Full Scan Mode
CP Amp: 20 mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 00-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
13:28:50

Tek Stop: 200 S/s 1 Acqs



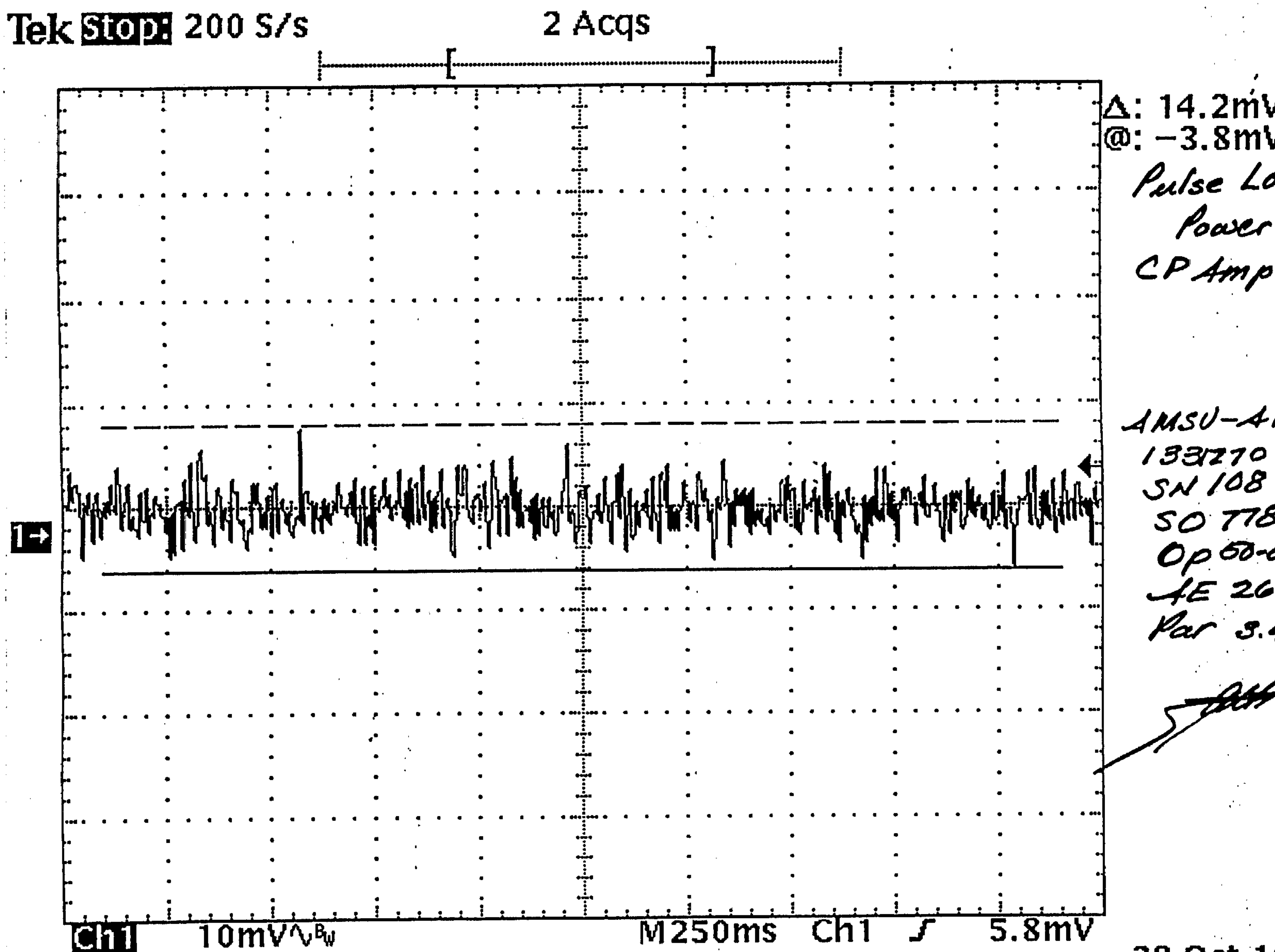
Δ: 13.4mV
@: 9.4mV

PLOT 16
Pulse Load Bus
All Power "Off"
CP Amp: 1mA/Div

AMSU-A1
1381720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
13:39:19

PLOT 17

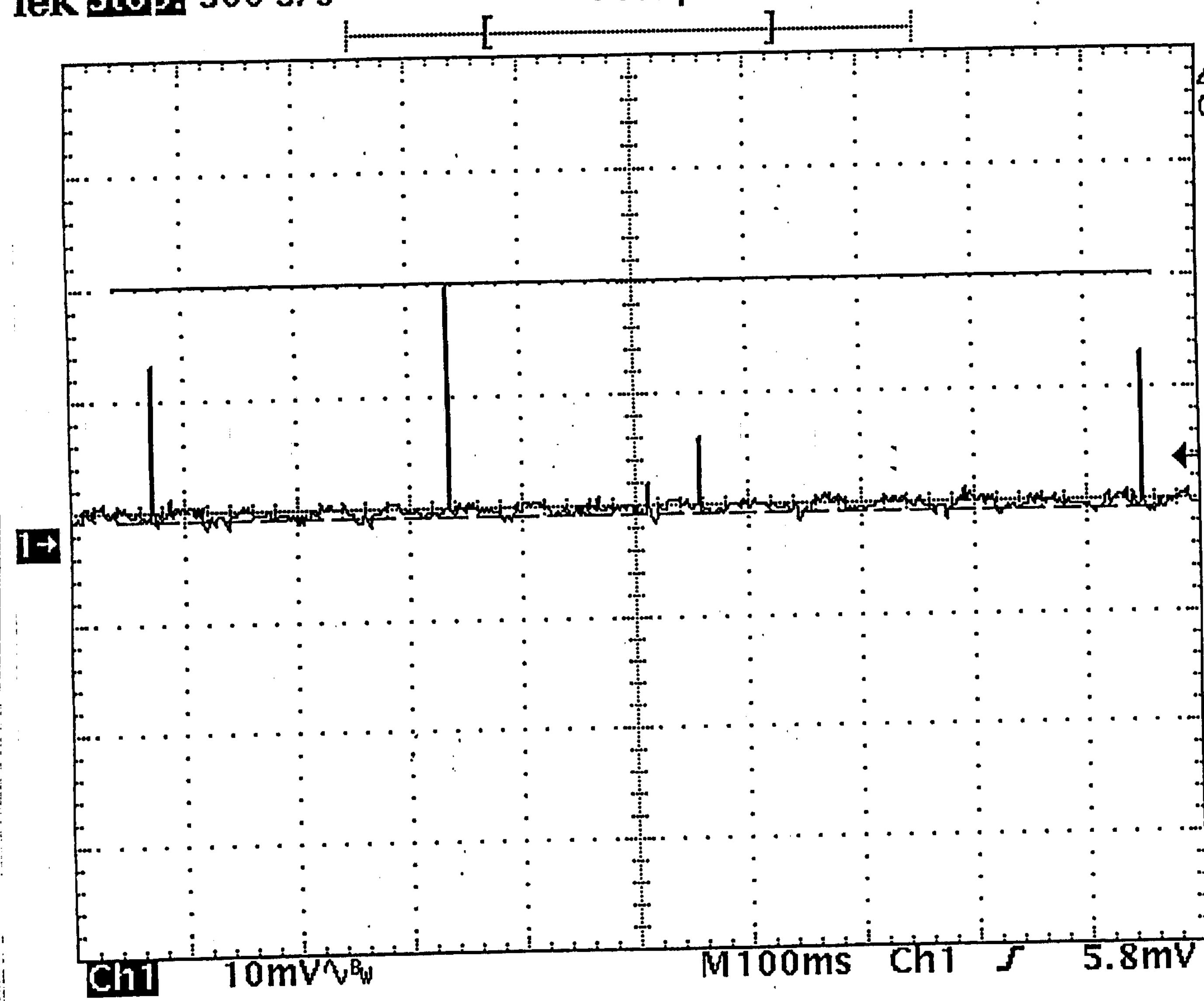


Pulse Load Bus
Power "On"
CP Amp: 1mA/div

AMSU-A1
1331270-2
SN 108
SO 778914
Op 50-0-00
QE 26151/SE
Par 3.4.5

28 Oct 1999
13:41:24

Tek Stop: 500 S/s 1 Acqs



PLOT 18

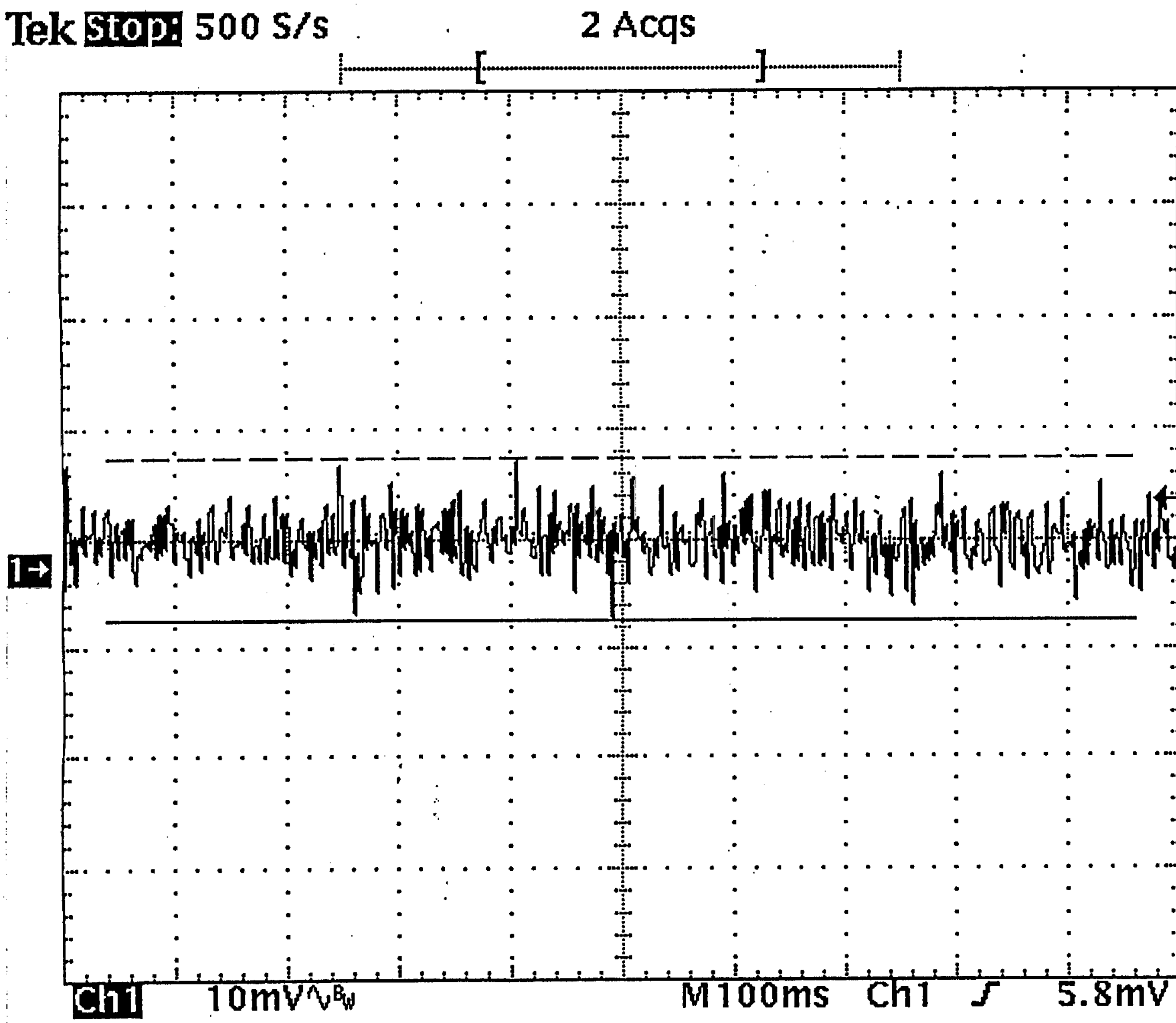
Δ: 21mV
@: 22.6mV

Pulse Load Bus
Warm Cal

CPAmp: 2 mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
13:52:26



PLOT 19

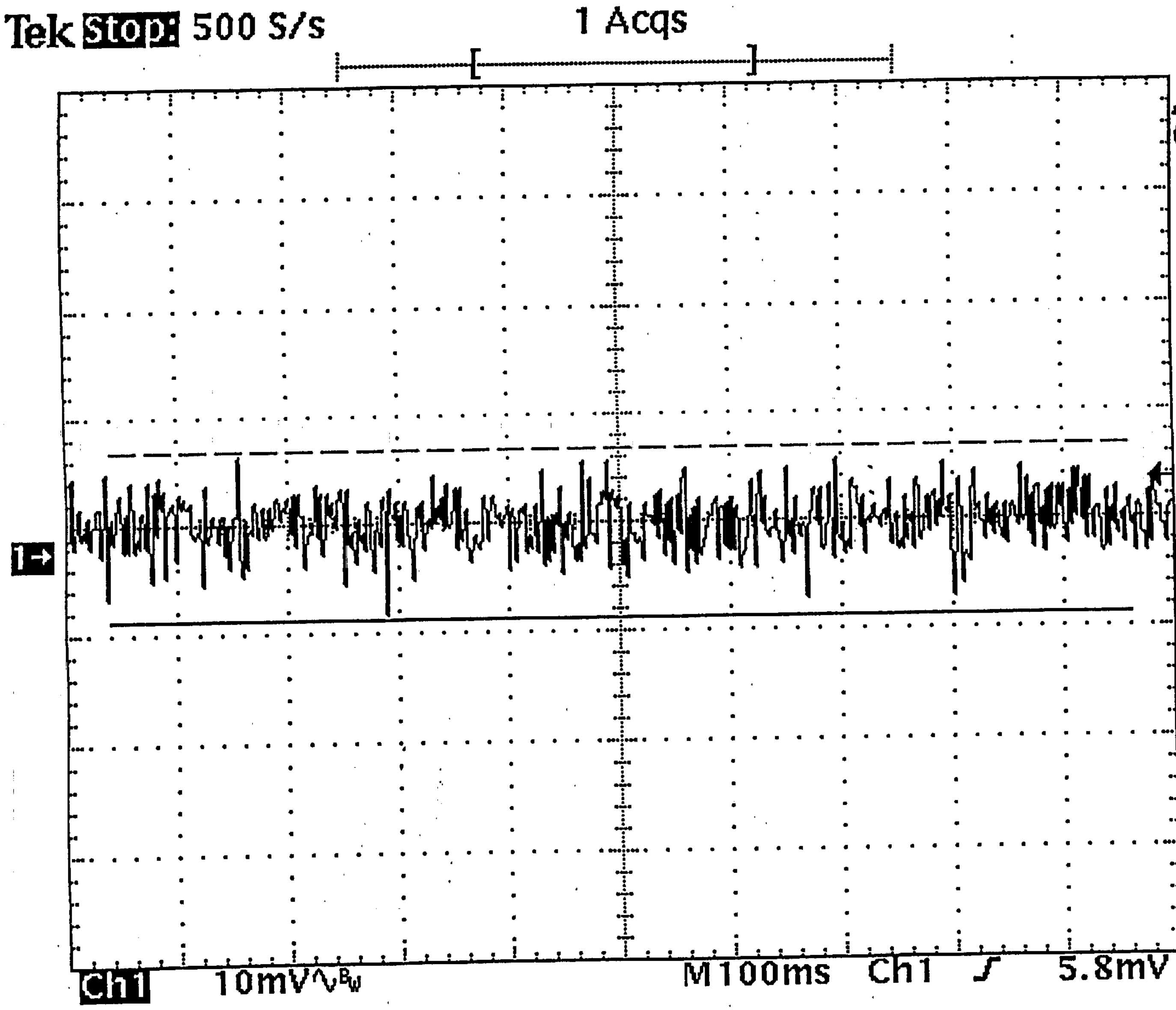
Δ: 14.8mV
@: −5mV

Analog Telemetry Bus
All Power "Off"
CPAmp: 1mA/DIV

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
14:06:44

PLOT 20

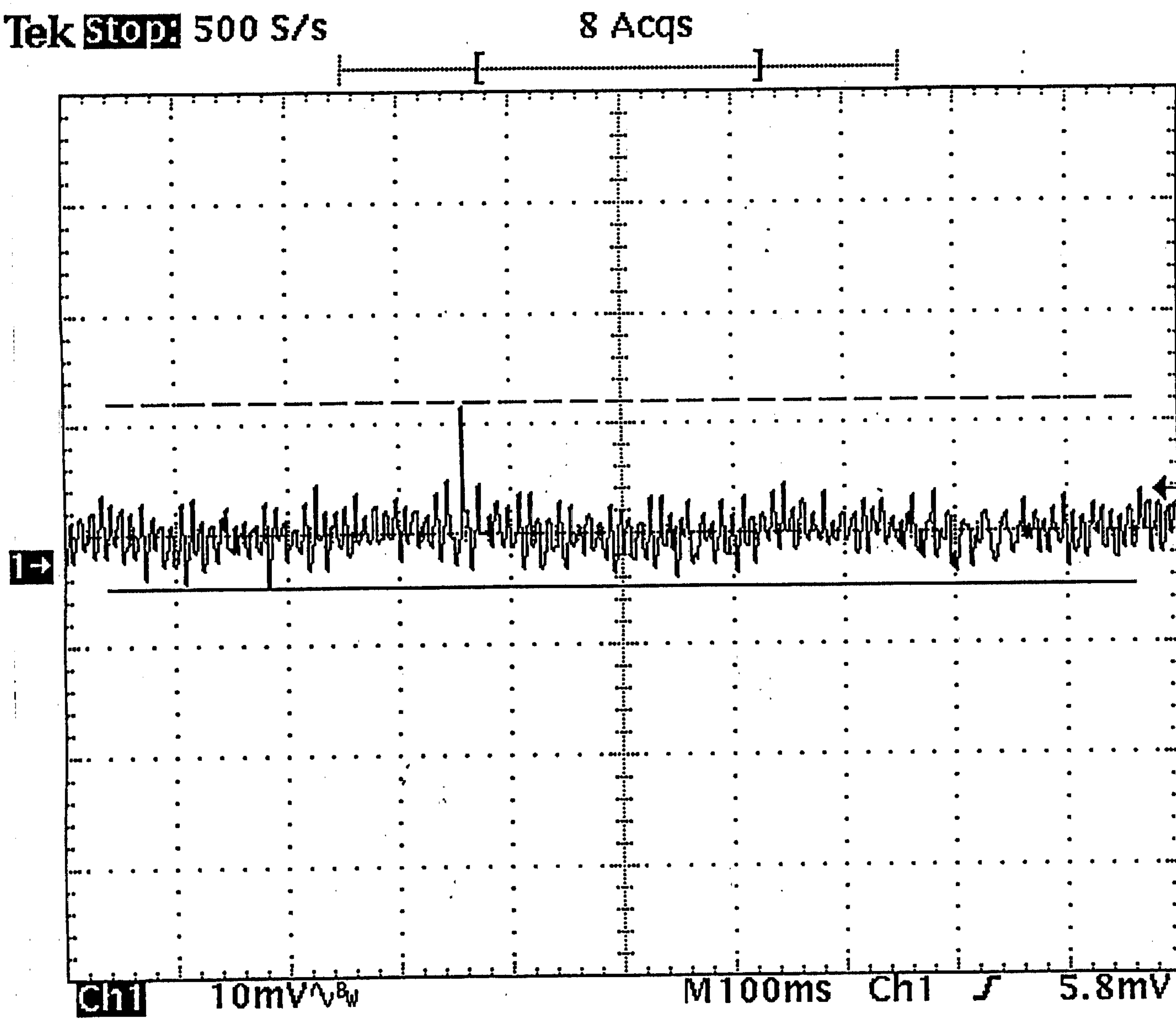


Δ: 15.6mV
@: −6.4mV

Analog Telemetry Bus
Power "On"
CP Amp: 1mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
14:09:53



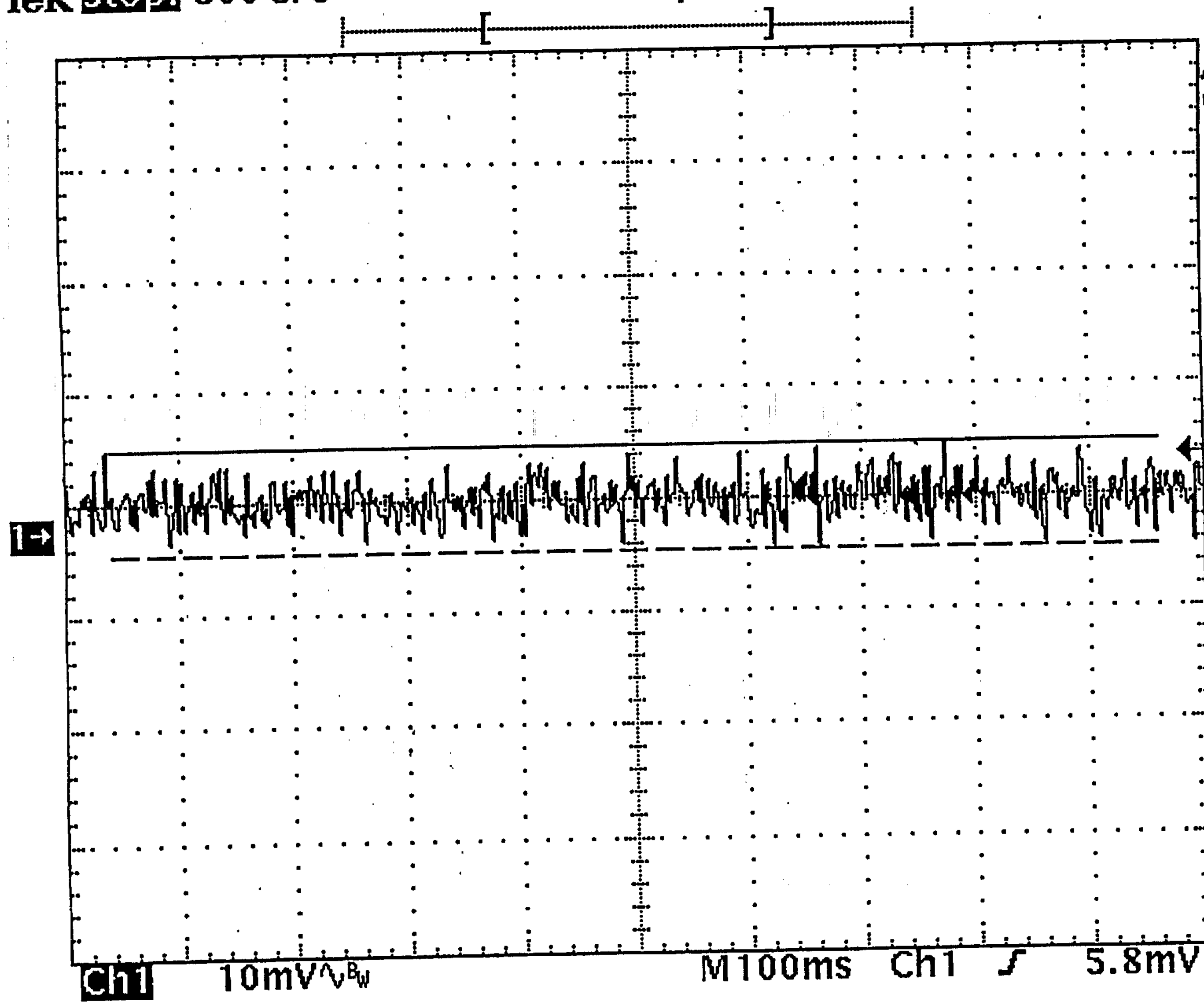
PLOT 21

Analog Telemetry Bus
Full Scan
CP Amp: 5 mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/SE
Par 34.5

28 Oct 1999
14:34:37

Tek Stop: 500 S/s   3 Acqs



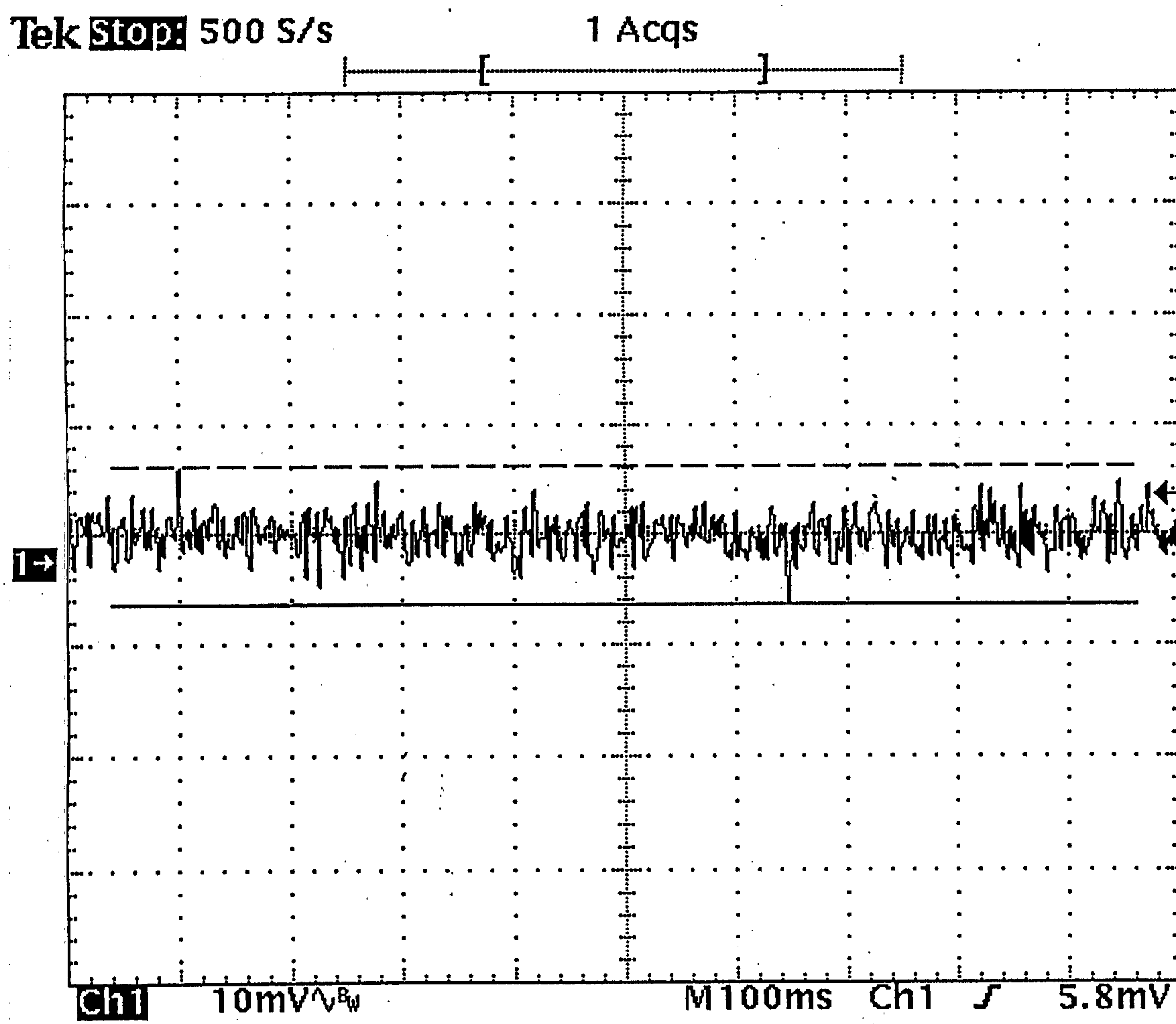
Δ: 9.4mV
@: 7.2mV

PLOT 22

+10V Interface Bus
Power "Off"
CP Amp: 1mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/5E
Par 3.4.5

28 Oct 1999
15:16:47



PLOT 23

Δ: 12.6mV
@: −4mV
+10V Interface Bus
Full Scan Mode
CP Amp: 1 mA/Div

AMSU-A1
1331720-2
SN 108
SO 778914
Op 50-0-00
AE 26151/SE
Par 3.4.5

28 Oct 1999
15:18:28

Electronic Systems Plant
P.O. Box 296
Azusa, California 91702-0296
\GE/Facility Ident: 70143

GENCORP
AEROJET

AE-26156/3C
6 April 1999

P/N 1331720-2-TVA
S/N 108 S/O 788841
Oper 8095
(AMEND #1)

JAN 27 2000 (TA 269)

Superseding
AE-26156/3B
10 March 1999

PROCESS SPECIFICATION

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

FINAL CPT
P/N: 1331720-2-TST
S/O: 373237 SN: 108
OP: 0830 Step 2
Test Eng: Ray [signature]
Start Date: 3-2-00
Quality: [signature] (TA 269)

Contract No.: NAS5-32314

Prepared for:

NASA/Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

TABLE OF CONTENTS

FIGURES

TABLES

TEST DATA SHEETS

TEST DATA SHEETS (CONT)

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.

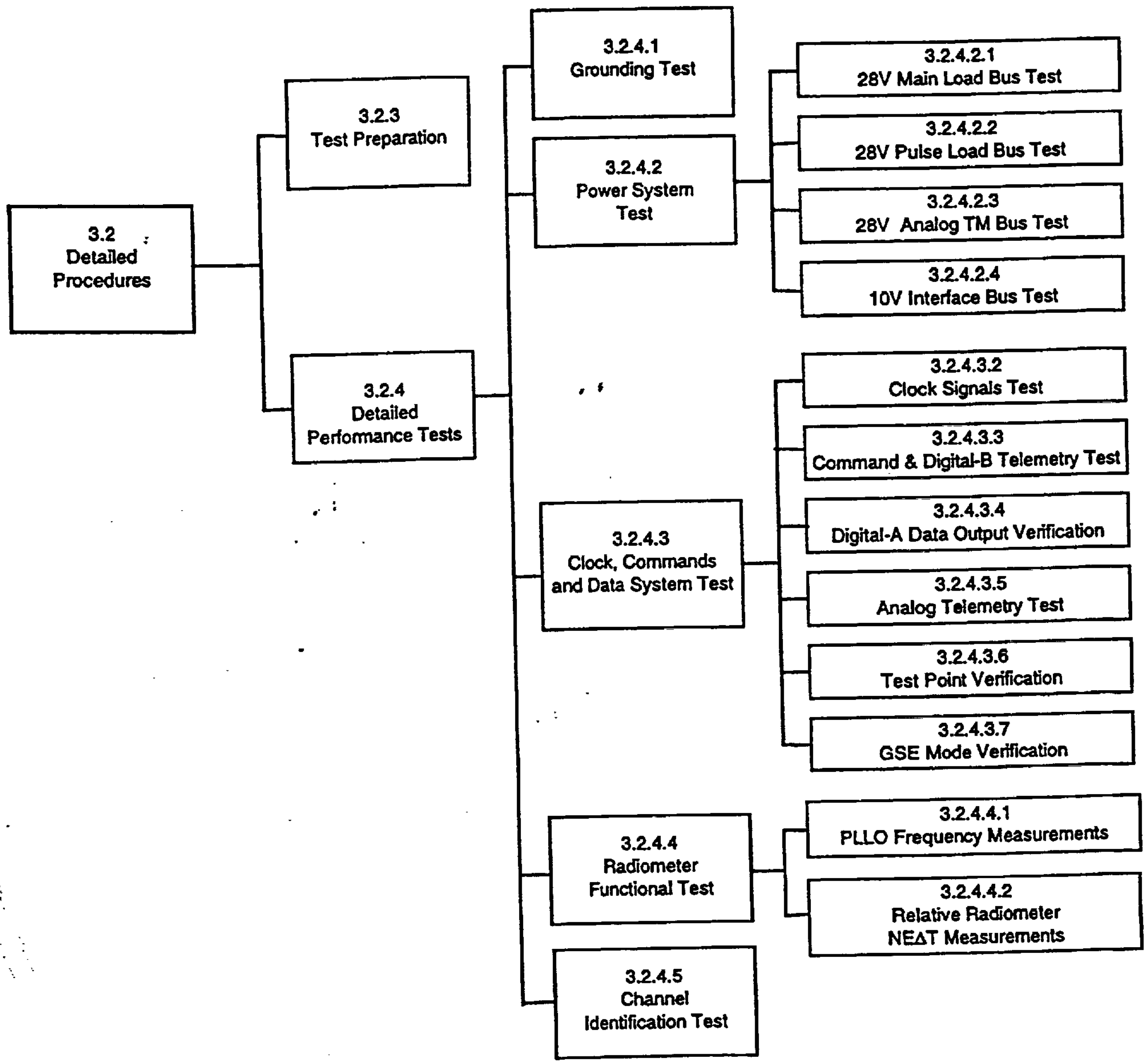


Figure 1. Test Procedure Sequence

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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-26151/5	Test Procedure, EMI/EMR & EMC for the METSAT/METOP Advanced Microwave Sounding Unit-A (AMSU-A)
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

Item	Quantity	Item Description	Mfg.	Model
1	1	Dynamic signal analyzer	Hewlett-Packard	3562A
2	1	Signal Generator	Hewlett-Packard	3314A
3	1	Oscilloscope	Tektronix	2225A
4	1	9-pin breakout box	Aerojet	2536-3743/SK1358702-1
5	1	15-pin breakout box	Aerojet	2536-3744/SK1358703-1
6	2	25-pin breakout box	Aerojet	2336-3746/SK1358704-1
7	1	37-pin breakout box	Aerojet	2536-3745/SK1358705-1
8	1	Relay Board	Aerojet	–
9	1	Double Shielded Connector	–	–
10	1	Lab. General Purpose Power Supply	Hewlett-Packard	6114
11	1	Oscilloscope	Tektronix	466A
12	1	Power Supply	Power Designs	3650-S
13	1	WR19 Harmonic Mixer (40-60 GHz)	Hewlett-Packard	HP11970V
14	1	Power Meter	Anritsu	ML83A
15	1	WR19 Feed Horn	TRG	V861
16	1	LN2 Container	Cole	N03726-20
17	1	Spectrum Analyzer	Hewlett-Packard	8566B
18	1	STE Computer	Aerojet	1336695
19	1	STE Interface Cable J1	Aerojet	1335758-1
20	1	STE Interface Cable J2	Aerojet	1335752-1
21	1	STE Interface Cable J3	Aerojet	1335756-1
22	1	STE Interface Cable J4	Aerojet	1335755-1
23	1	STE Interface Cable J5	Aerojet	1335753-1
24	1	STE Interface Cable J6	Aerojet	1335754-1
25	1	STE Interface Cable J7	Aerojet	1335757-1
26	1	Oscilloscope Camera	Tektronix	–
27	1	Current Probe	Tektronix	AM503
28	1	Plotter	Hewlett-Packard	7475A
29	1	Frequency Counter	Hewlett-Packard	5316A
30	1	Multimeter (Digital volt-ohm meter)	Fluke	77

Table I. Equipment List (Continued)

Item	Quantity	Item Description	Mfg.	Model
31	1	Cold Target Stand A1-1	Aerojet	T-1291001-3
32	1	Cold Target Stand A1-2	Aerojet	T-1291001-2
33	2	Cold Target Support	Aerojet	T-1291000-1
34	1	Sweeper	Hewlett-Packard	83623A
35	1	Multiplier	Hewlett-Packard	83557A/83558A
36	1	Coupler/Detector	Hewlett-Packard	83557-60001
37	1	Spectrum Analyzer	Hewlett-Packard	8563E

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 ± 10°C

d. Pressure: 610 to 810 torr

e. Humidity: 50 ± 20% (no condensation)

f. The instrument shall be placed in its protective bag (1338427) when not in use.

Table II. AMSU-A1 Performance Tests

Paragraph	Test Description	1st CPT	LPT	Sub CPT	Final CPT
3.2.4.1	Grounding	X	X	X	X
3.2.4.2.1.1	+28 Main Load Bus (MLB) Turn-On Transient	X			X
3.2.4.2.1.2	+28 MLB Operating Power	X	Note 2	Note 3	X
3.2.4.2.1.3	Instrument Feedback Test	Note 8			
3.2.4.2.1.4	Transient Susceptibility Test	X			
3.2.4.2.2	+28 Pulse Load Bus (PLB) Peak Current	X		Note 4	X
3.2.4.2.2.8	Instrument Feedback Test (PLB)	Note 8			
3.2.4.2.2.9	Transient Susceptibility Test	X			
3.2.4.2.3	+28 Analog Telemetry Bus (ATB)	X		X	X
3.2.4.2.3.2	Instrument Feedback Test (ATB)	Note 8			
3.2.4.2.3.3	Transient Susceptibility Test	X			
3.2.4.2.4	+10 V Interface Bus	X		X	X
3.2.4.2.4.2	Instrument Feedback Test	Note 8			
3.2.4.2.5	Power Input Test for LPT		X		
3.2.4.3.2	Clock Signals	X			X
3.2.4.3.3	Commands and Digital-B Telemetry	X	X	X	X
3.2.4.3.4	Digital-A Data Output	X	Note 5	Note 5	X
3.2.4.3.5	Analog Telemetry	X	Note 6	Note 6	X
3.2.4.3.6	Test Points	X		X	X
3.2.4.3.7	GSE Mode	X Note 7			
3.2.4.4	Radiometer Functional	Title			
3.2.4.4.1	PLLO Frequency Measurement	X			X
3.2.4.4.2.2	Relative NEΔT	X	X	X	X
3.2.4.5	Channel Identification Test	X			

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.
8. Instrument feedback test will be performed in the EMI/RFI chamber using EMI/RFI test procedure AE-26151/5.

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 1335695 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 LN_2 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.

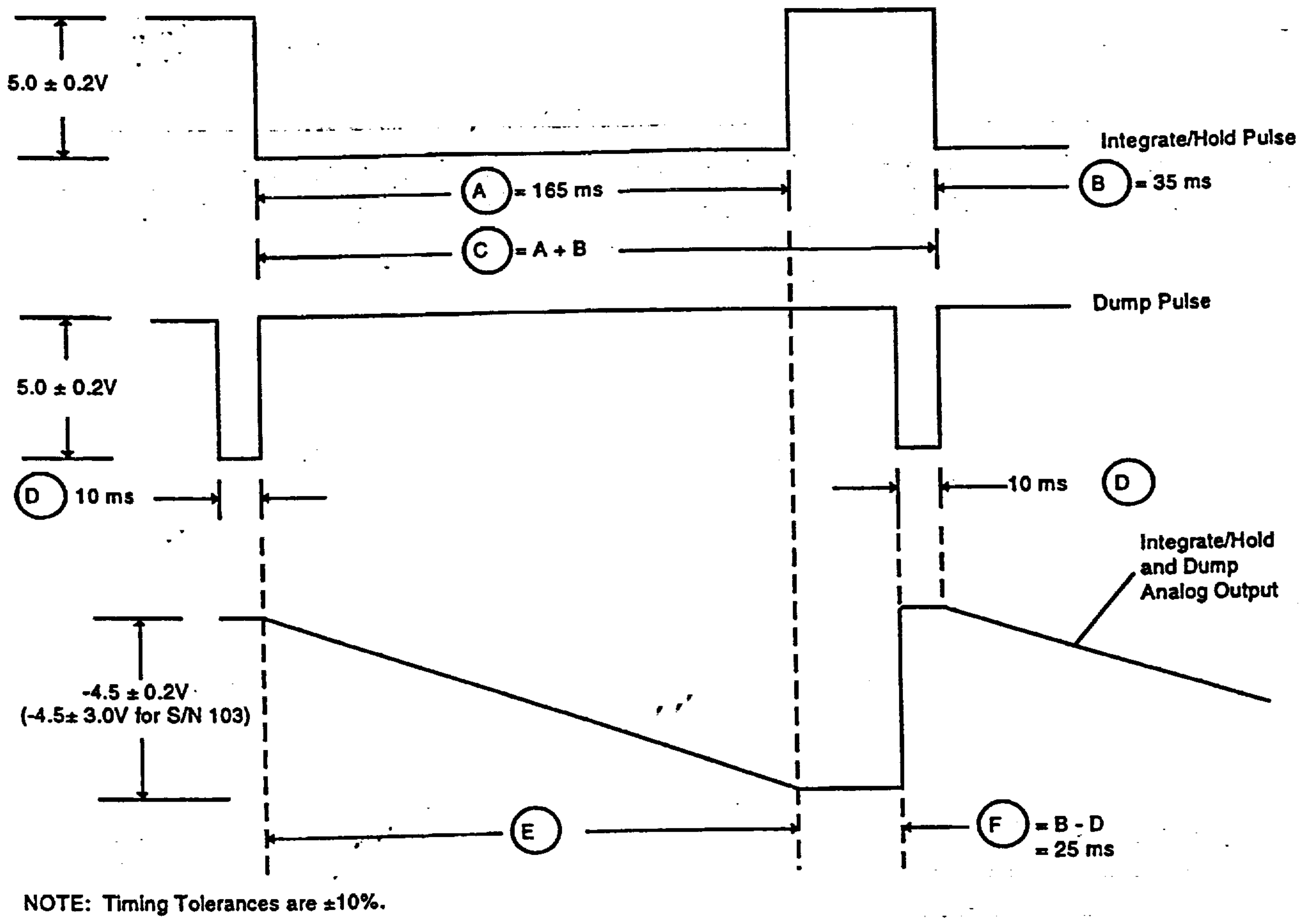


Figure 2. Signal Output at J7

8. On the Monitor Only Menu, press [14] COMMANDS. The Commands Menu will be displayed in the window area.

9. On the Commands Menu, press [9] MODULE POWER = CONNECT. Wait at least 18 seconds for command execution. This applies power to the unit.

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

COMMANDS				
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO [15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO [16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES [17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1 [18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO [19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO [20]
POWER [4] ON				

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.

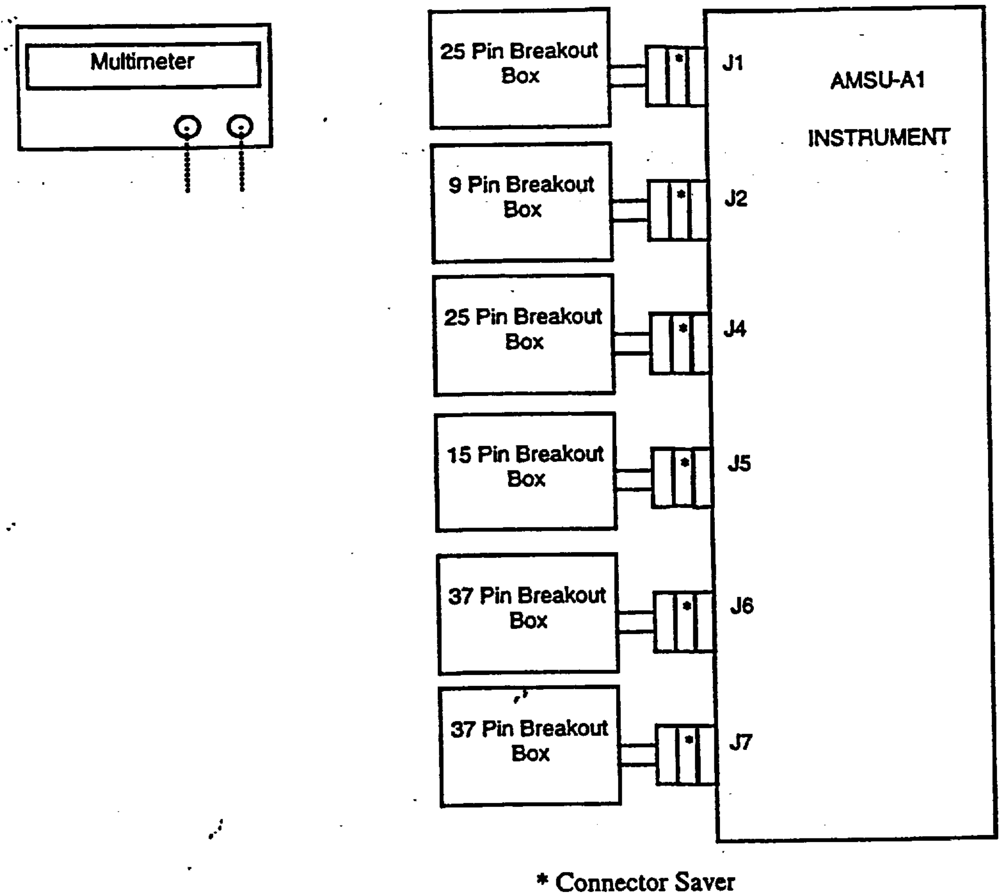


Figure 3. Grounding Test Setup

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)

3.2.4.2.1 *+28 V main load bus test*

3.2.4.2.1.1 ***+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:

Select **MEAS MODE**
- Select *Time Capture*
- Select *Capture Select*
- Select *Capture Length*; Enter *300.0*; Select *msec*

Select **FREQ**
- Select E SMPL *Off*
- Select *Freq Span*; Enter *25*; Select *kHz*

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 *100;* Select *mV*
- Select *Arm AU*
- 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, 300;* Select *msec*
- Select *Y Fixd Scale*; Enter *0,80;* 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 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.

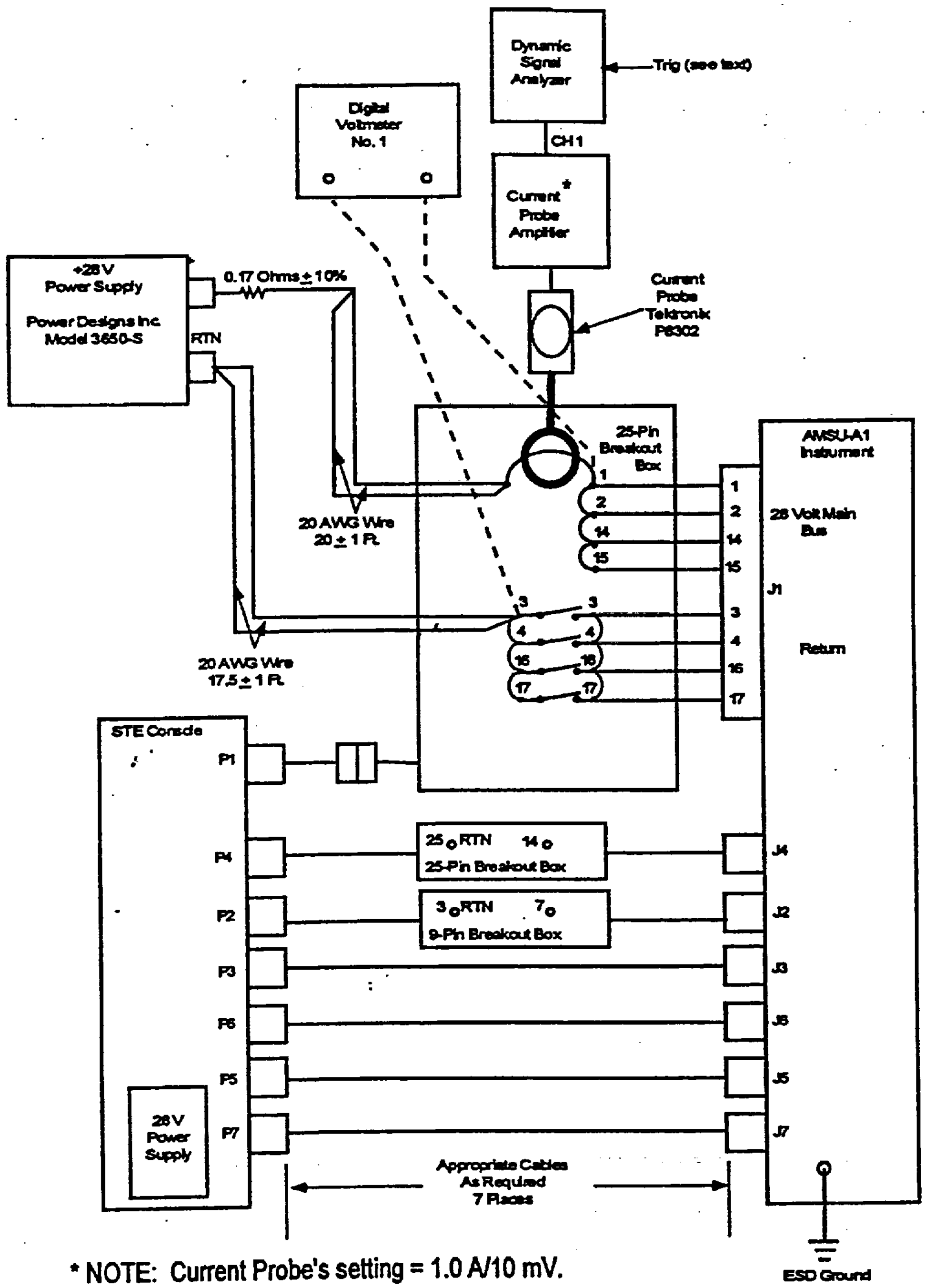
c) Adjust the "y" axis voltage range to ±4 mV.

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.



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

Figure 4. +28 V Main Load Bus Verification Setup

COMMANDS					
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
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 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:

   46.8 mV x (1.0 A/10 mV) = 4.68 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:

   Change in voltage .... 35.29 mV
   Change in time (microseconds)............ 31.25 µs
   Current/div on current amplifier .... 1000 mA/10 mV

   35.29 mV x (1000 mA/10 mV)/31.25 µs = 112.9 mA/µs

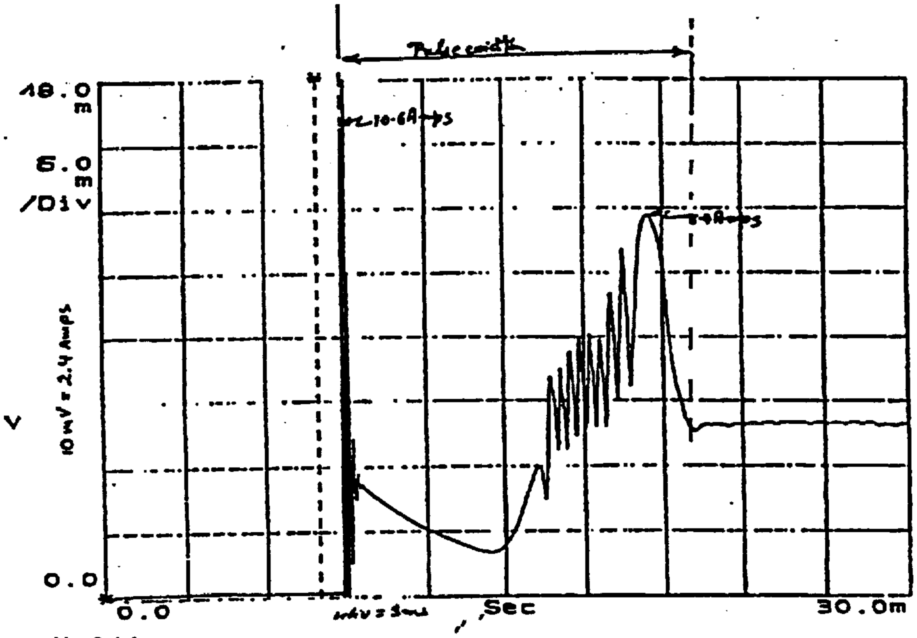
10. Record the computed value on TDS 2.

11. 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.

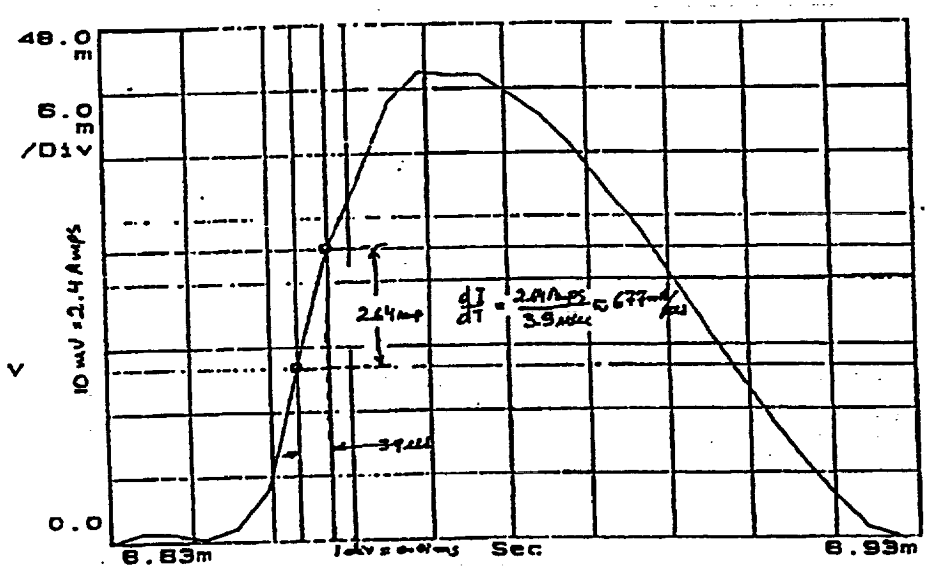
13. With the multimeter, adjust the external power supply to 28.00 ±0.05 Vdc as measured between J1-1 (high) and J1-3 (low).

14. Repeat steps 3 through 10.



10 mV = 2.4 Amps

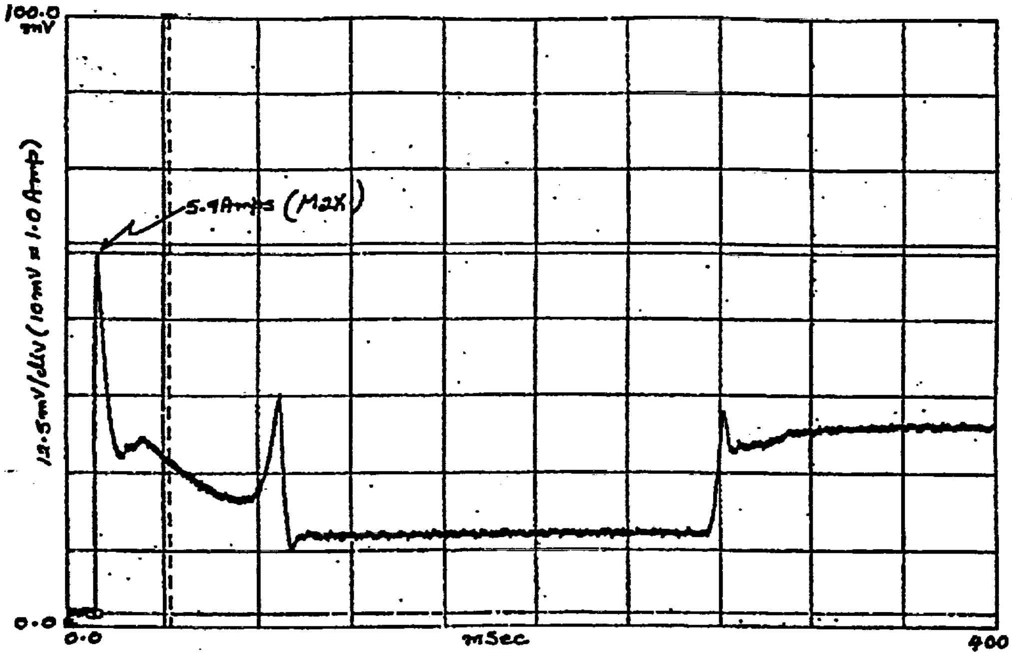
AMSU-A1 (S/N 102) Main Load Bus Worst Case Transient



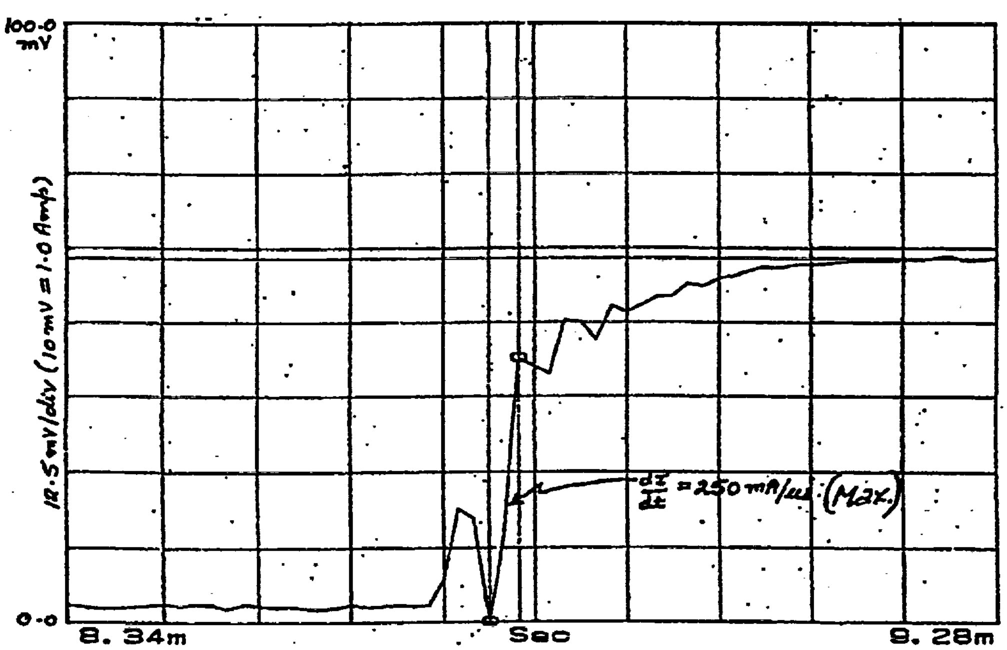
10 mV = 2.4 Amps

AMSU-A1 (S/N 102) Main Load Bus $\frac{dI}{dT}$ at Worst Case Transient

Figure 5. +28 V Main Bus Load Peak Power for KLM (S/N 102, 103 and 104)



AMSU-A1 Main Load Bus Worst Case Turn-on Transient



AMSU-A1 Main Load Bus $\frac{dI}{dT}$ at Worst Case Turn-on Transient

Figure 6. +28 V Main Bus Load Peak Power for METSAT (S/N 105 and up)

3.2.4.2.1.2 *+28 V MLB operating power.* Measure the steady state current, voltage, and power as follows:

1. Configure the unit and test equipment as shown in Figure 4. Verify that switches 1, 2, 14 and 15 of the breakout box are in the OPEN position.
2. Turn off power supplies. Insert current meter in positive lead of external power supply, turn power supplies on. Place the unit in operating condition as described in 3.2.4.2.1.1, step 3. While monitoring voltmeter No. 1, adjust the external power supply to 27.0 ± 0.1 volts (see Figure 4). Record the voltage displayed on voltmeter No. 1 on TDS 3 (MLB voltage at 27 Vdc).
3. Record the operating current on TDS 3.
4. Compute the operating power (in watts) as explained on TDS 3.
5. Execute command [18] PLL POWER to change from PLLO#1 to PLLO#2. 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 on TDS 3.
8. Execute command [18] PLL POWER to change from PLLO#2 to PLLO#1. Allow the instrument to stabilize for a minimum of two minutes.
9. Adjust the external power supply to 28.0 ± 0.1 Vdc and record voltage on TDS 3.
10. Record the operating current on TDS 3.
11. Compute the operating power (in watts) as explained on TDS 3.
12. Execute command [18] PLL POWER to change from PLLO#1 to PLLO#2. Allow the instrument to stabilize for a minimum of two minutes.
13. Record the operating current on TDS 3.
14. Compute the operating power (in watts) as explained on TDS 3.
15. Execute command [18] PLL POWER to change from PLLO#2 to PLLO#1. Allow the instrument to stabilize for a minimum of two minutes.
16. Adjust the external power supply to 29.0 ± 0.1 Vdc and record voltage on TDS 3.
17. Record the operating current on TDS 3.
18. Compute the operating power (in watts) as explained on TDS 3.
19. Execute command [18] PLL POWER to change from PLLO#1 to PLLO#2. Allow the instrument to stabilize for a minimum of two minutes.
20. Record the operating current on TDS 3.
21. Compute the operating power (in watts) as explained on TDS 3.
22. Execute command [18] PLL POWER to change from PLLO#2 to PLLO#1. Allow the instrument to stabilize for a minimum of two minutes.

23. Adjust the external power supply to 28.0 ± 0.5 Vdc.

24. Turn the unit off by executing [9] MODULE POWER = DISCONNECT.

3.2.4.2.1.3 ***Instrument feedback test.*** Instrument feedback test will be performed in the EMI/RFI chamber using EMI/RFI test procedure AE-26151/5.

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.

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.

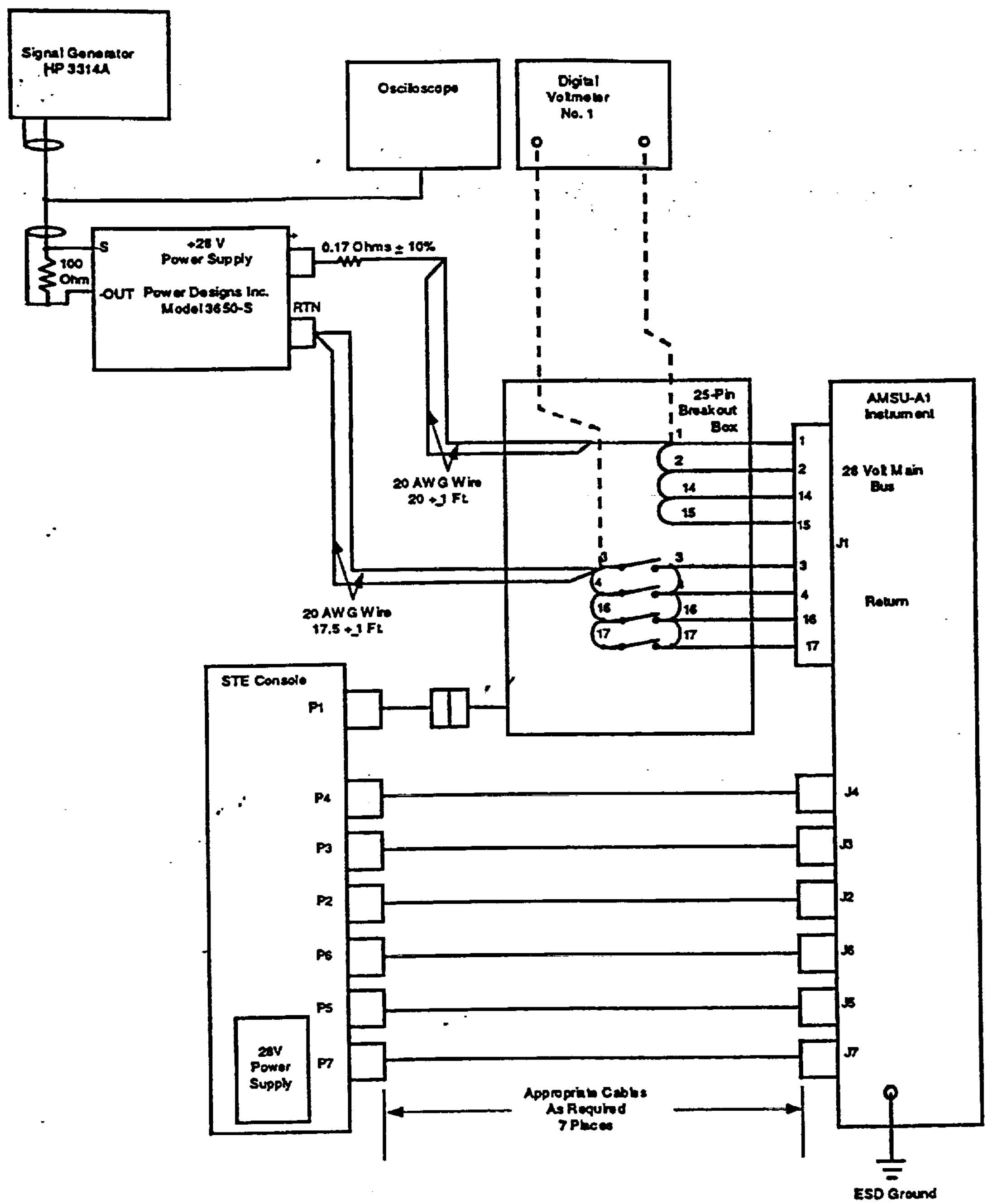
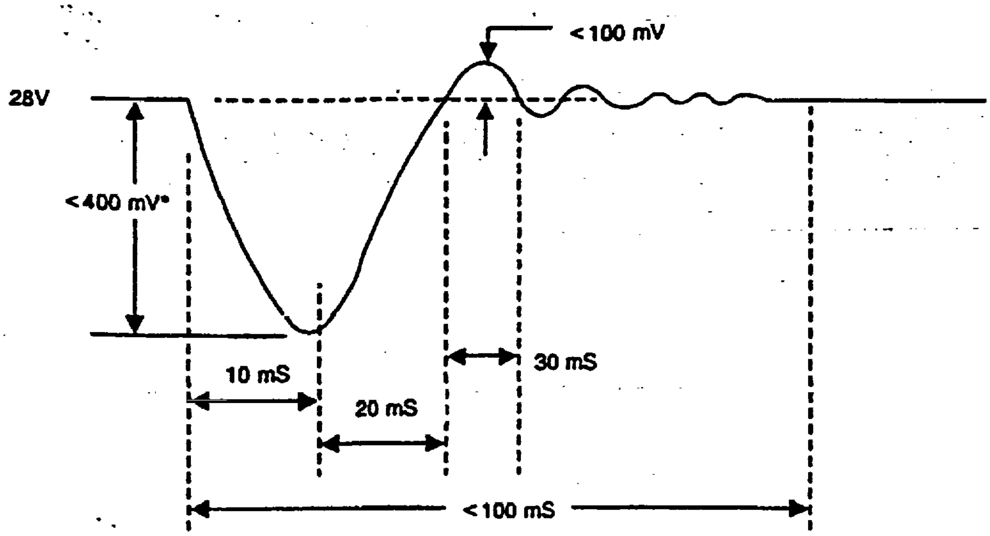


Figure 7. +28 V MLB Transient Susceptibility and Power Quality Tests Setup



* 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 8. Load Induced Transient (Main Bus)

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:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

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.

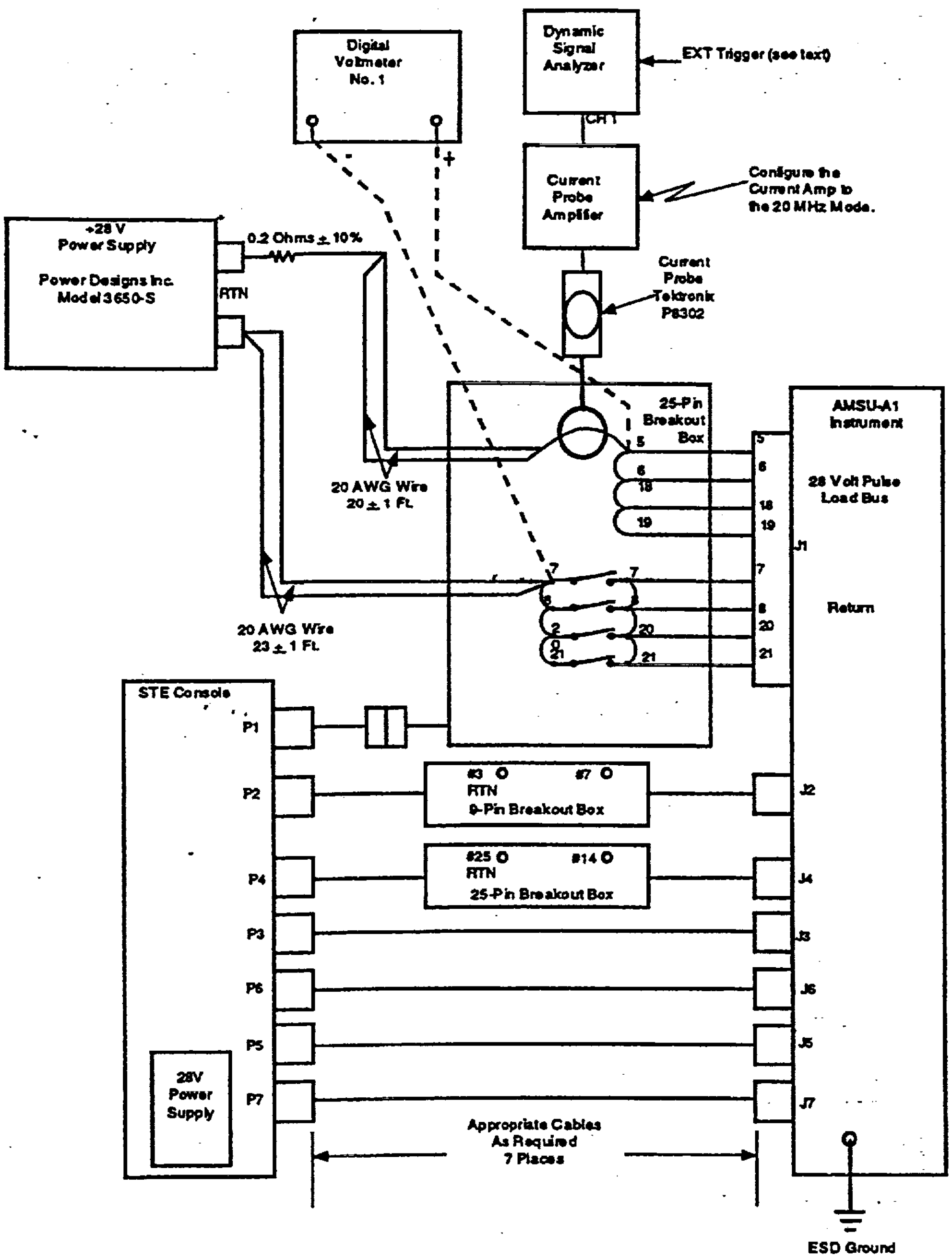


Figure 9. +28 V Pulse Load Verification Setup

3. Configure the dynamic signal analyzer 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*; 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 **INPUT TRIG**
 Select *Trig Level;* Enter *1.5;* Select *V*
 Select *Arm AU*
 Select *Ext*
 Select *Slope -*
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)*

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.

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.

COMMANDS					
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON					

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 mV x (200 mA/10 mV) = 1200 mA = 1.20 amps

3.2.4.2.2.2 *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.

3.2.4.2.2.3 *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.

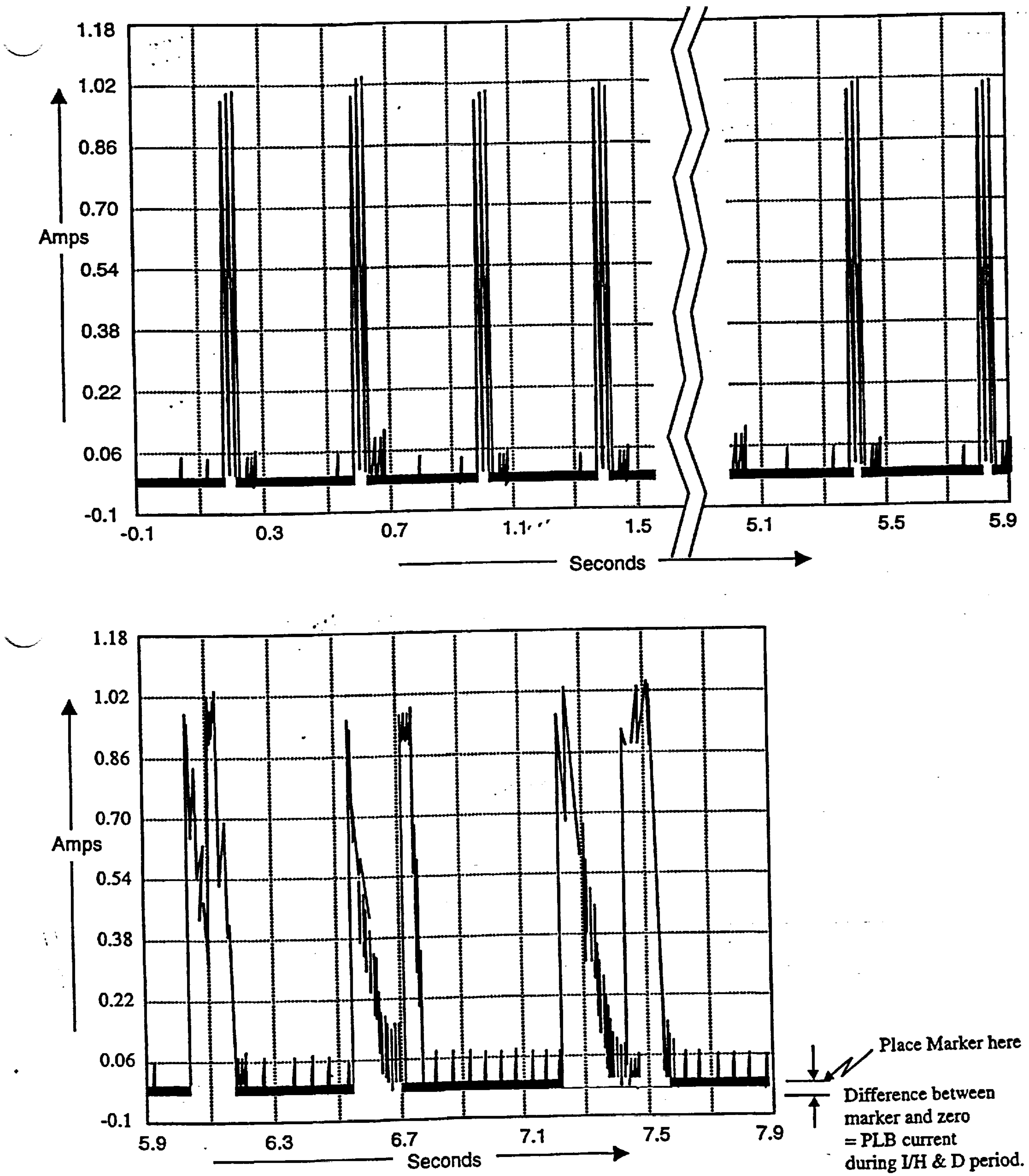


Figure 10. Typical Load Current Waveforms from the +28 V Pulse Load Bus

3.2.4.2.2.4 *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 Fxd 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:

[32.4 mV-sec x (200 mA/10 mV)]/8 sec = 81 mA

Enter the calculated integrated value on TDS 4.

3.2.4.2.2.6 *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 *msec*
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 *Extenal*
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.

COMMANDS

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
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:

   $$276 \text{ mV} \times (200 \text{ mA}/10 \text{ mV}) = 5520 \text{ mA} = 5.52 \text{ amps}$$

   Record this value on TDS 4.

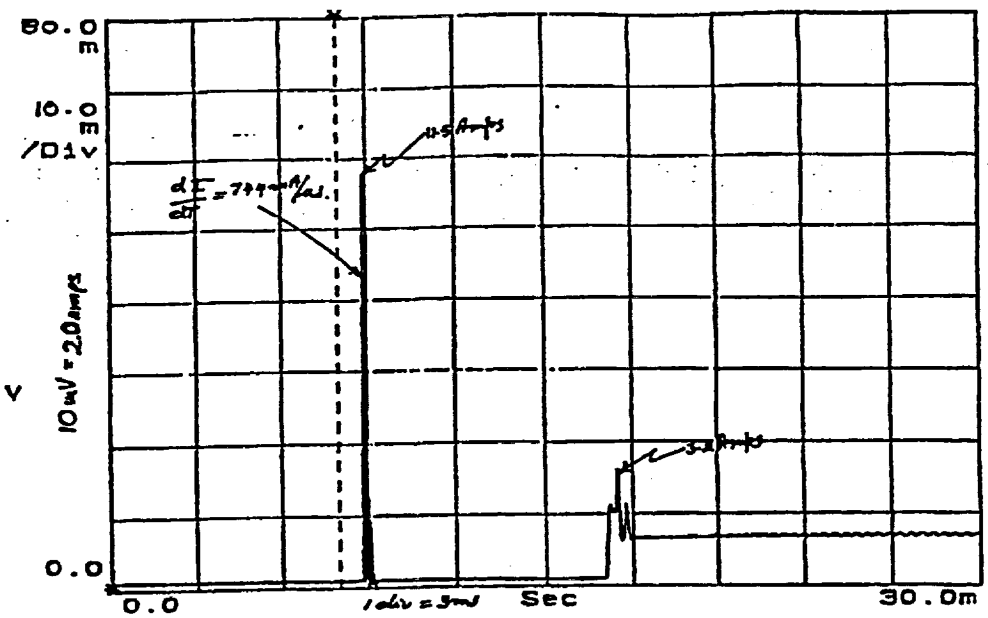
9. The 1st derivative of the current waveform must be calculated. Compute the dI/dT as follows:

   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:

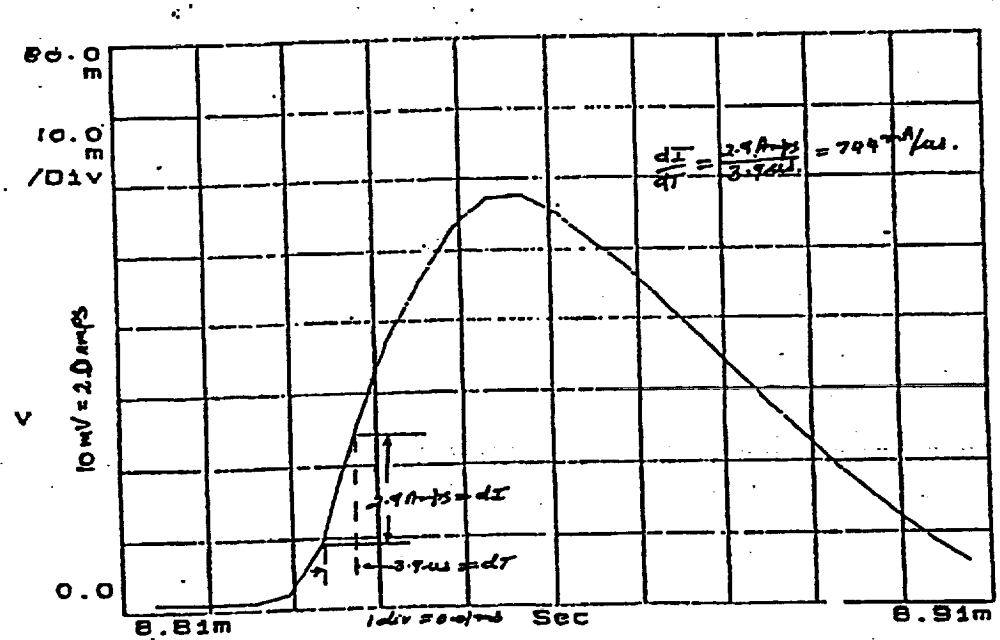
   Change in voltage .... 144 mV
   Change in time (microseconds)............ 19.5 µs
   Current/div on current amplifier .... 200 mA/10 mV

   $$144 \text{ mV} \times (200 \text{ mA}/10 \text{ mV})/19.5\ \mu\text{s} = 147.7 \text{ mA}/\mu\text{s}$$

10. Record the computed value on TDS 4.



AMSU-A1 PLB Worst Case Transient



AMSU-A1 PLB $\frac{dI}{dT}$ Worst Case Transient

Figure 11. +28V Pulse Load Bus Turn-on Transient

3.2.4.2.2.7 ***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.
5. Repeat step 2 after placing instrument in Warm Calm mode and commanding both motors off.
6. After stabilizing for a minimum of 20 scans, acquire one Full Scan mode printout, and attach it to TDS 4.

3.2.4.2.2.8 ***Instrument feedback test (PLB).*** Instrument feedback test will be performed in the EMI/RFI chamber using EMI/RFI test procedure AE-26151/5.

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.

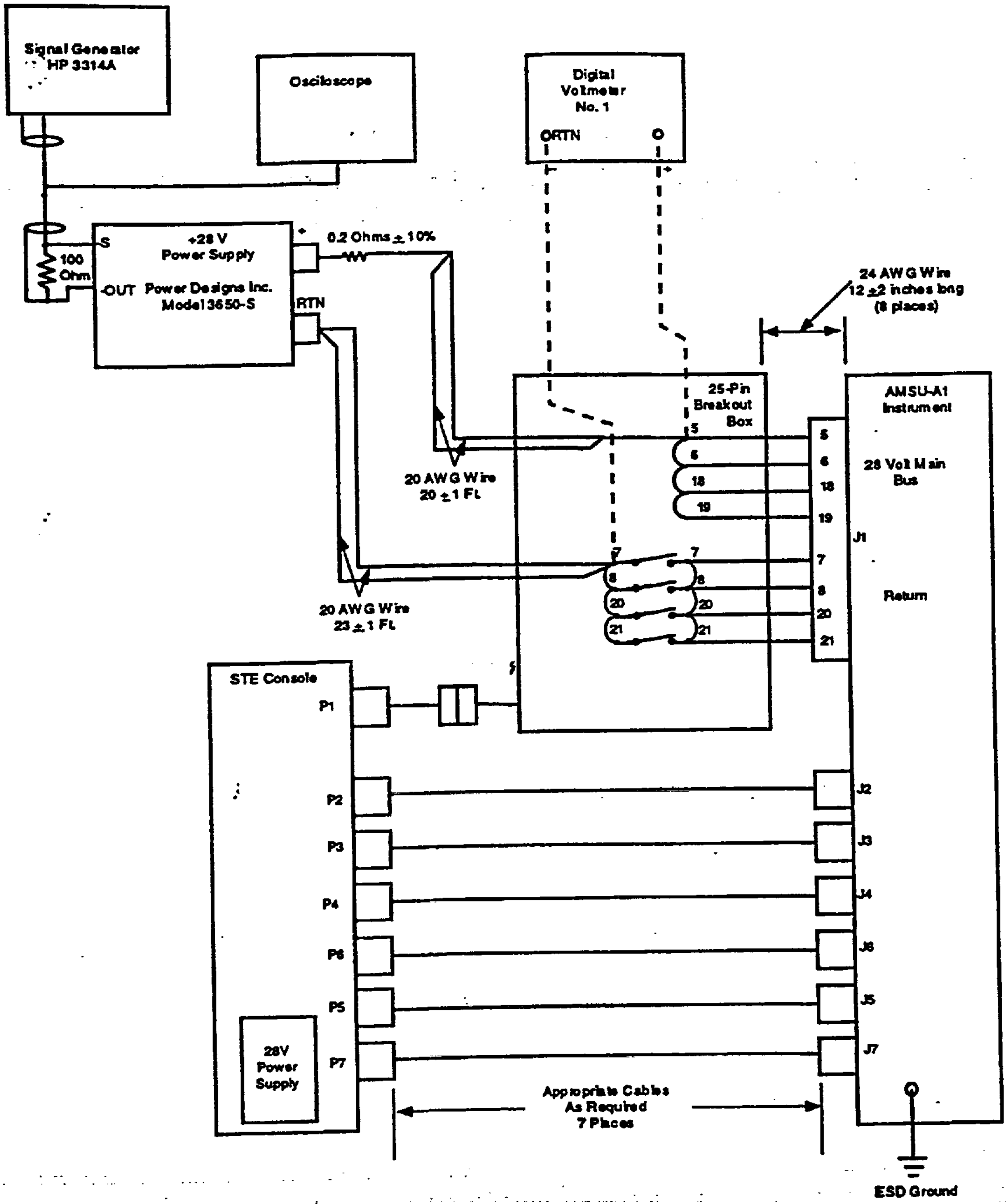


Figure 12. +28V PLB Transient Susceptibility and Power Quality Tests Setup

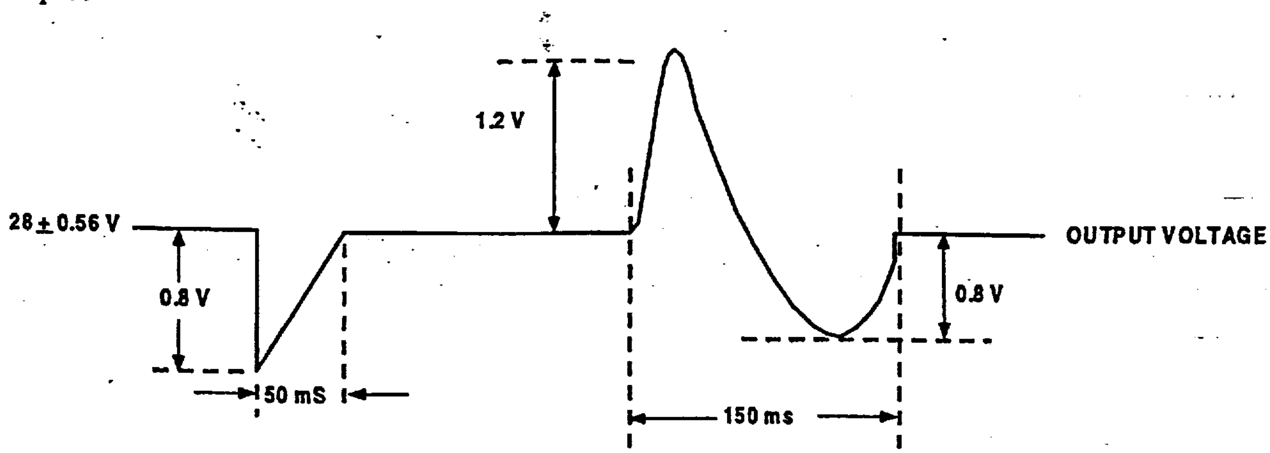


Figure 13. Load Induced Transient (Pulse Load)

3.2.4.2.2.9.3 ***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:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

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 51.

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)*. Instrument feedback test will be performed in the EMI/RFI chamber using EMI/RFI test procedure AE-26151/5.

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.

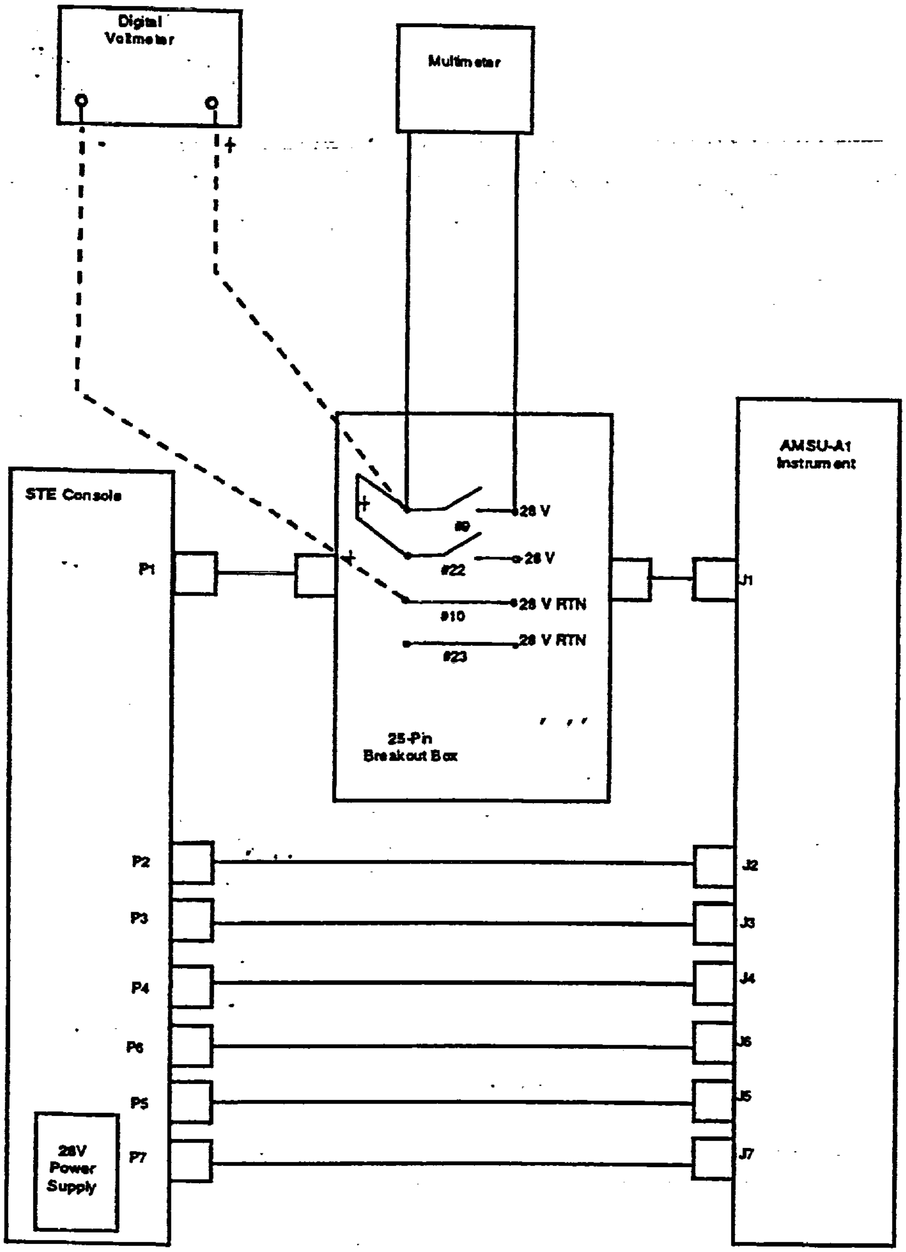


Figure 14. +28V Analog Telemetry Bus Test Setup

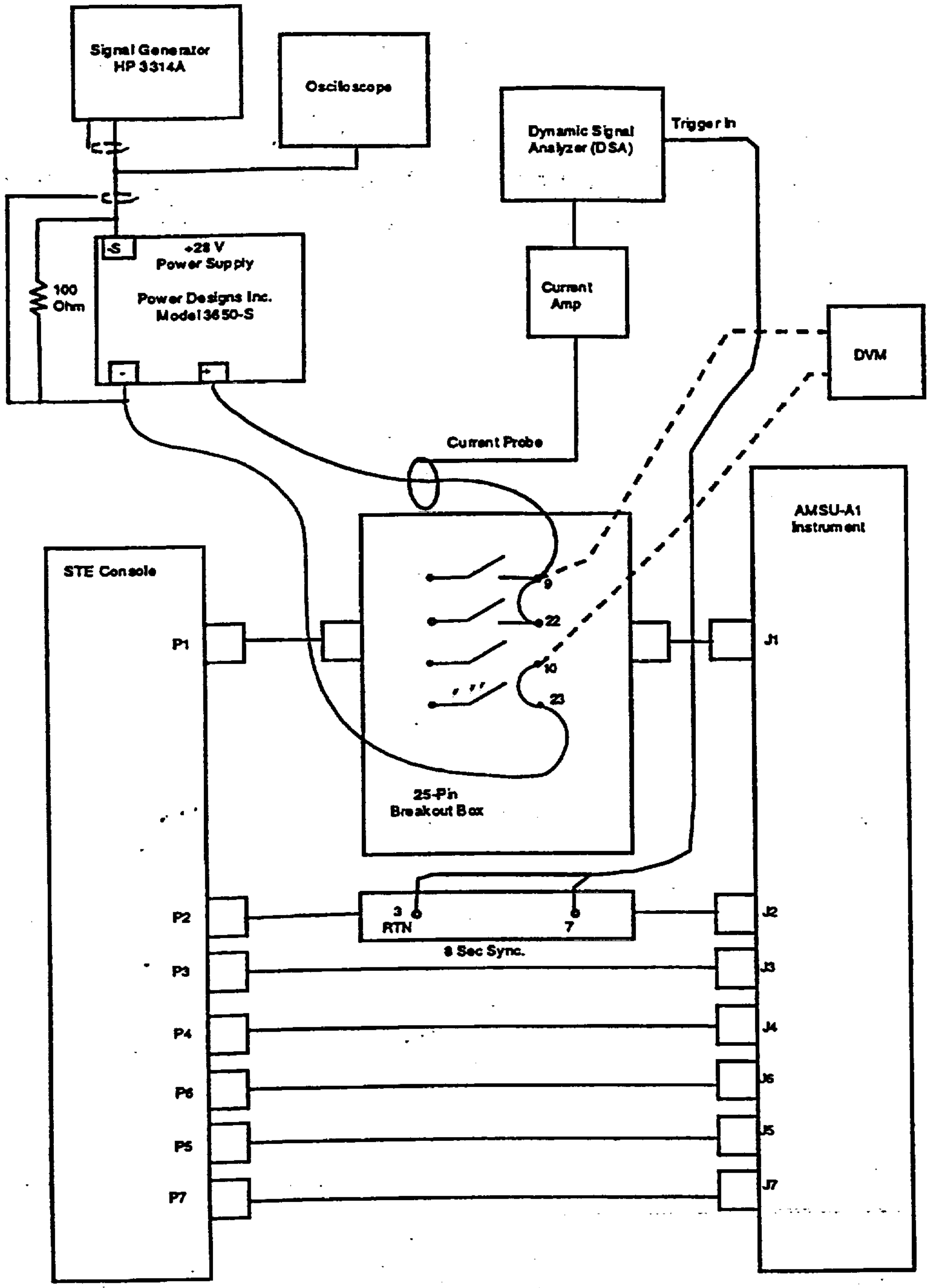


Figure 15. +28 Vdc Analog Telemetry Bus Ripple Current and Transient Susceptibility Test Setup

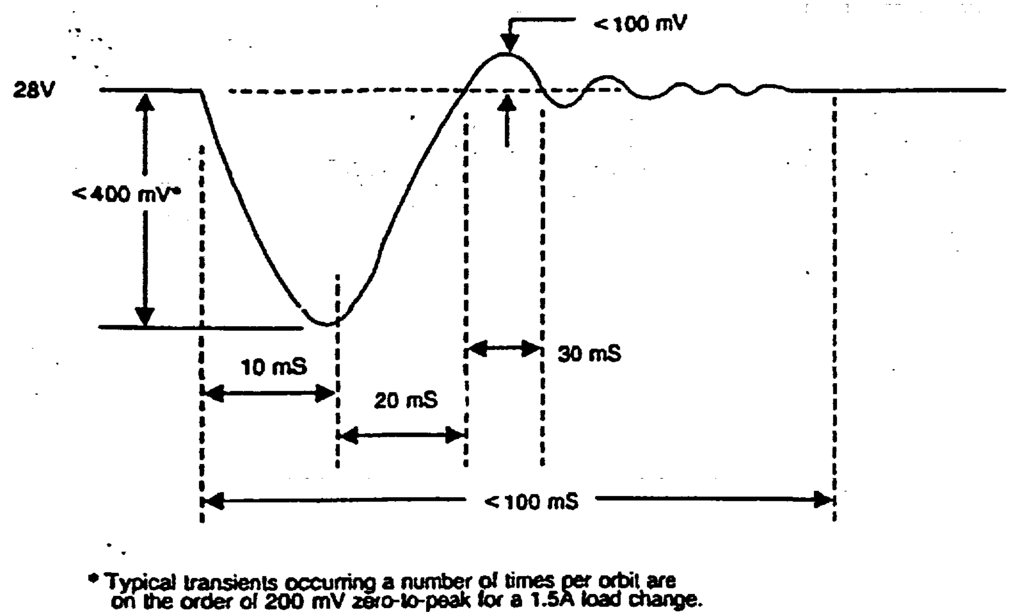


Figure 16. Load Induced Transient (Main Bus)

3.2.4.2.3.3.3 ***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:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

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.*** Instrument feedback test will be performed in the EMI/RFI chamber using EMI/RFI test procedure AE-26151/5.

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.

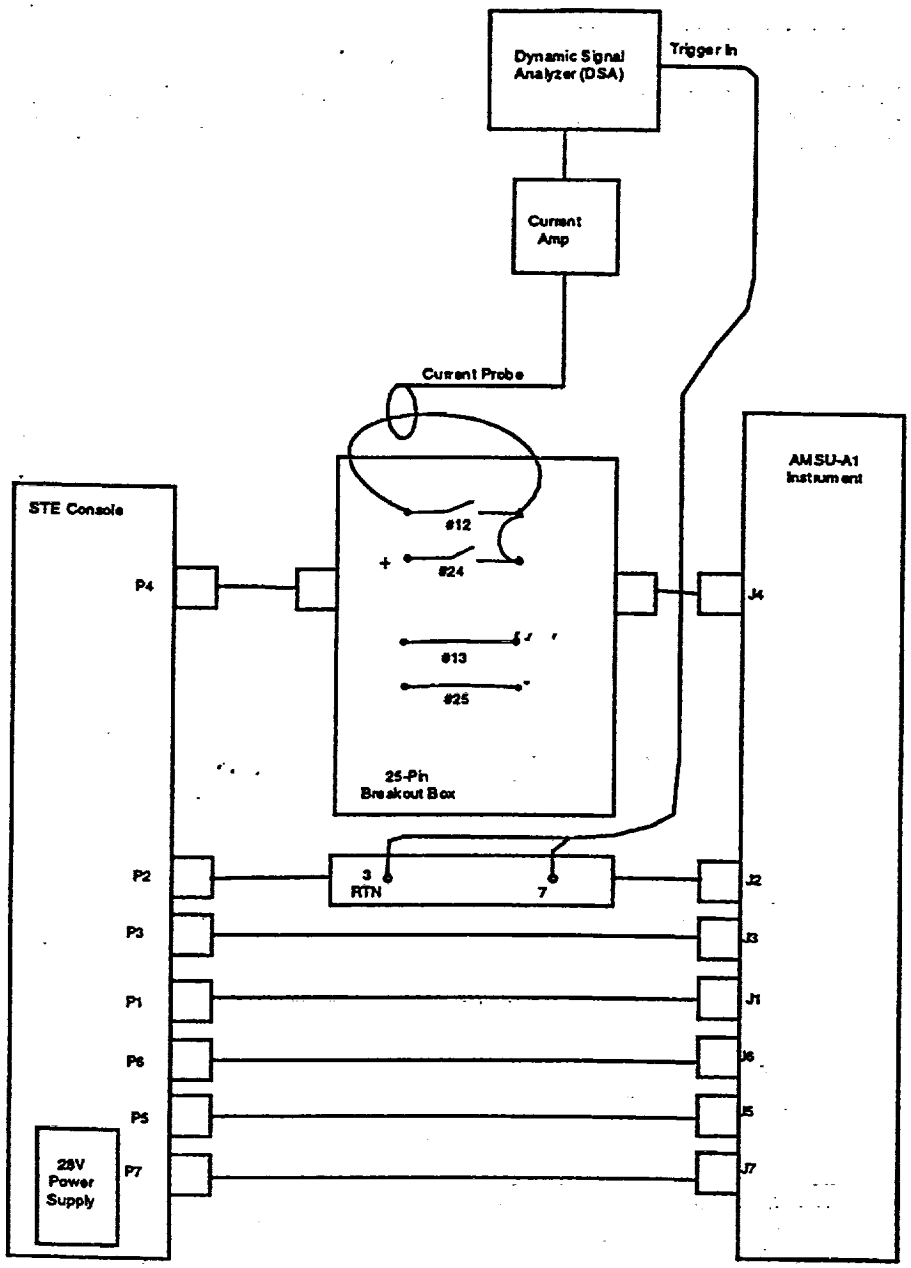


Figure 17. +10V Interface Bus Operating Power and Ripple Current Measurements Test Setup

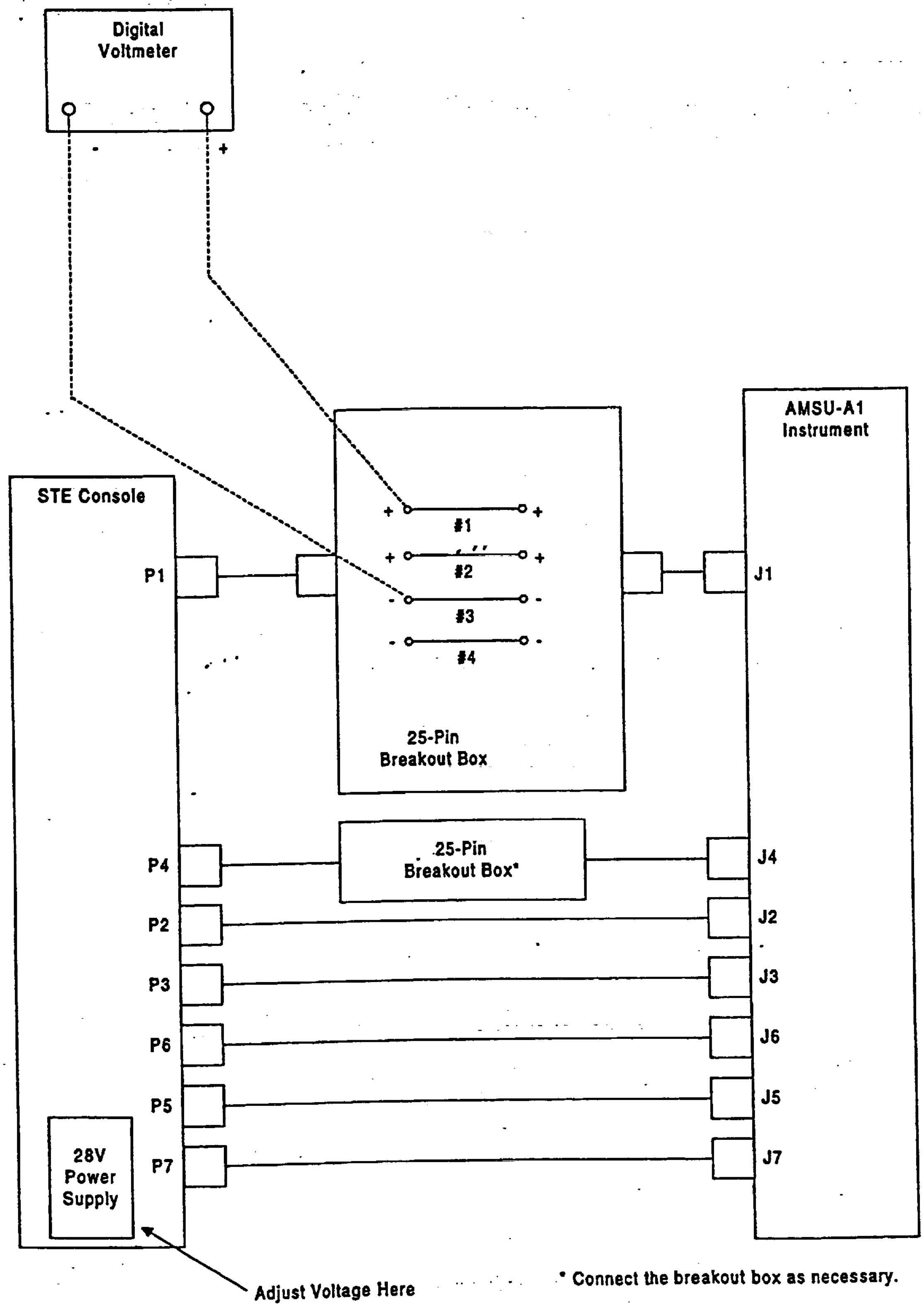


Figure 18. +28 V Main Load Bus Test Setup (For LPT Only)

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

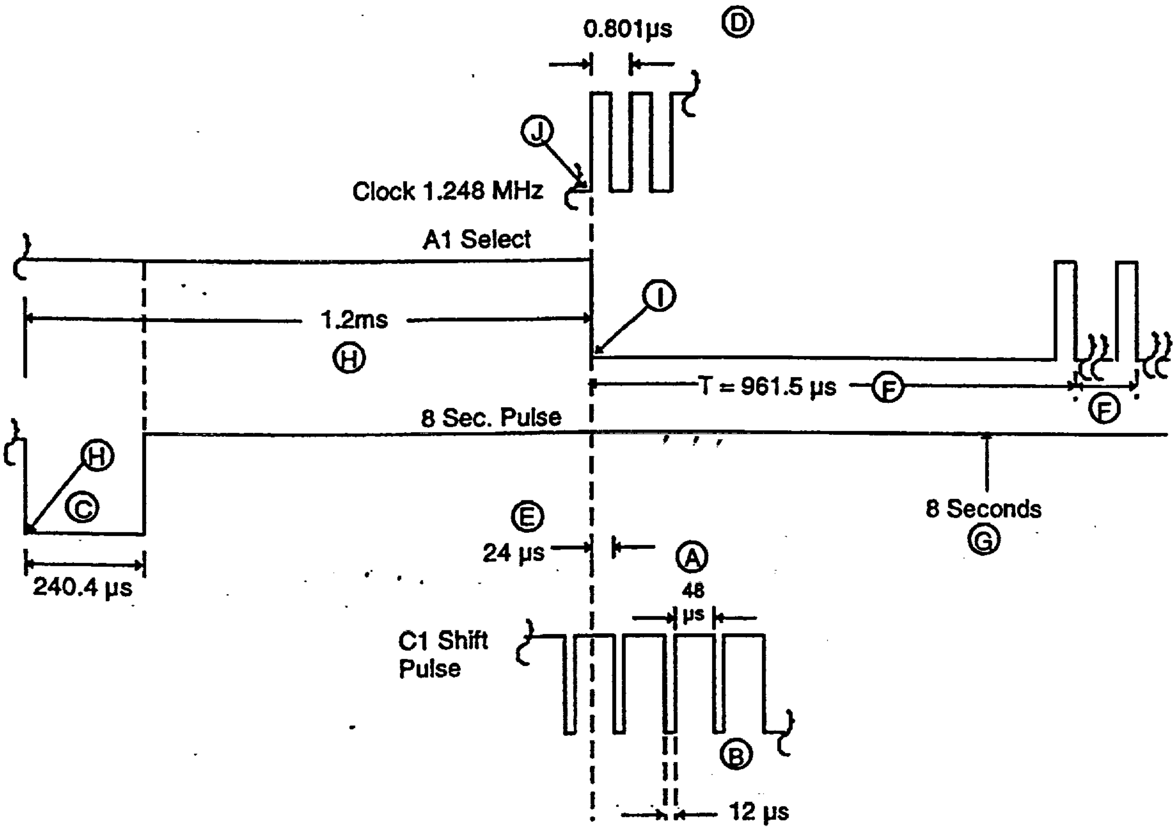


Figure 19. Clock Pulses Timing and Synchronization

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.

4. Using the oscilloscope, measure the 1.248 MHz clock signal. Record the data and attach the photograph or plot on TDS 8.

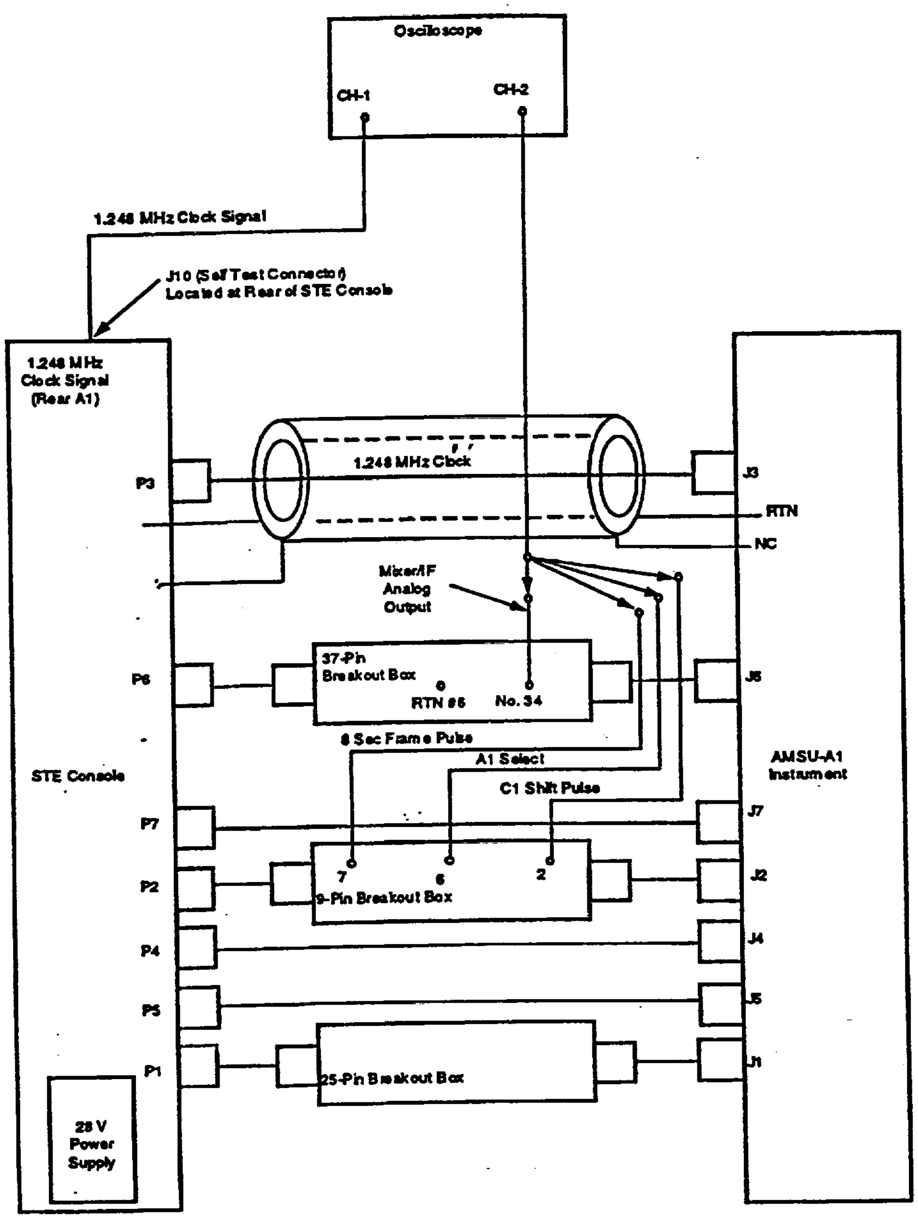


Figure 20. Clock Signals Test Setup

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.
   4. From the photograph or plot, verify the synchronization as described in TDS 13. Record pass or fail.

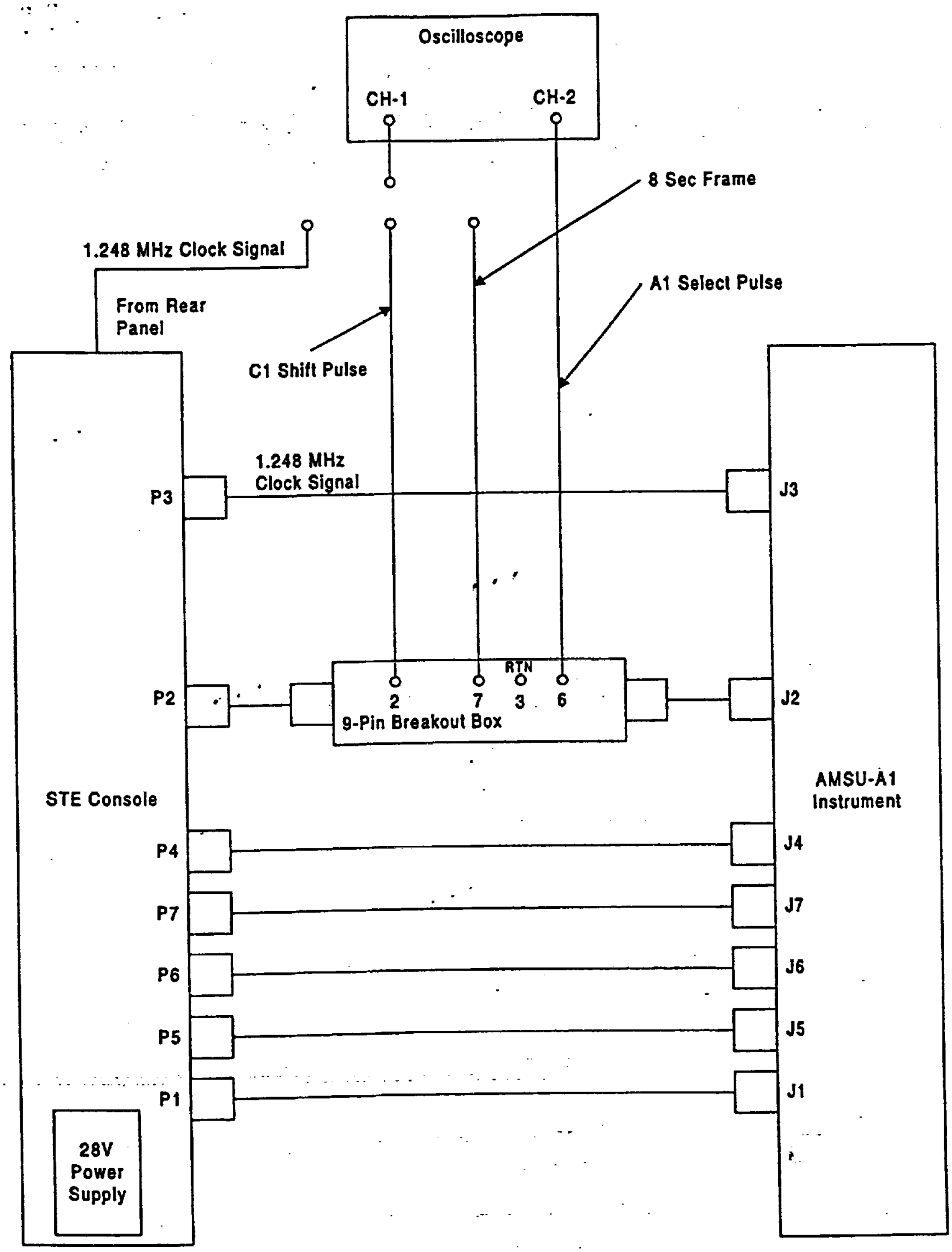


Figure 21. Synchronization Signal Relationships Test Setup

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:

   a. Press [12] POWER ON (from 1st screen).

   b. Press [2] MONITOR ONLY (from 1st screen)

   c. Press [14] COMMANDS (from 2nd screen)

   Verify the screen displays the default parameters below.

COMMANDS						
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	YES	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON					

2. From the Commands Menu, execute command [11] MODULE TOTALLY OFF to OFF mode.

3. Wait at least 18 seconds, then verify that the following events are in effect:

   a. [11] MODULE TOTALLY OFF = OFF

   b. [12] SCANNER A1-1 POWER = OFF.

   c. [13] SCANNER A1-2 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.

.2.4.3.3.2 ***Survival heater power ON/OFF command.*** The survival heater power ON/OFF command shall be tested as ›llows:

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.

2.4.3.3.3 ***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	ANTENNA IN COLD CAL POS =	NO	[15]
[10] SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12] SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13] SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14] ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON				

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

2. Execute. [12] SCANNER A1-1 POWER = OFF
   [13] SCANNER A1-2 POWER = OFF

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

3. Execute. [12] SCANNER A1-1 POWER = ON
   [13] SCANNER A1-2 POWER = ON

   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] ANTENNA IN COLD CAL POS = YES
   [14] ANTENNA 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] ANTENNA IN NADIR POSITION = YES
[15] ANTENNA 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] ANTENNA 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

[V] 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).

[VI] 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:

COMMANDS

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON					

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.

<u>(I), (II), and (III) Sync, Unit ID, and Digital-B Data</u>

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.

<u>[IV] Reflector position</u>

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.

[V] Radiometric data

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

[VI] 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.

3.2.4.3.4.2 *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:

COMMANDS					
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	YES	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON					

[I], [II], and [III] 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.

[IV] 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.

[V] Radiometric data

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

[VI] 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.

3.2.4.3.4.3 *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				
[9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	YES	[15]
[10] SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12] SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13] SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14] ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON				

[I], [II] and [III] 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 27. Record pass or fail.

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.

[IV] 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.

[V] Radiometric data

5. Using the individual printout, verify that the data are within the values specified on TDS 29. Record pass or fail.

[VII] Temperature sensors

6. Using the individual printout, verify that elements 1090 through 1180 are within the values specified on TDS 30 (sheets 1 and 2). Record pass or fail.

3.2.4.3.4.4 *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:

COMMANDS				
[9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10] SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	YES	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12] SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13] SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14] ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON				

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

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.

[IV] 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

[V] Radiometric data

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

[VI] Temperature sensors

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.

:.4.3.5 *Analog telemetry test*. The purpose of this test is to verify that the 26 analog telemetry signals are within :uirements. The purpose of the analog telemetry signals is to provide information about the functionality of the subsystems :ing normal operation of the unit. The analog telemetry signals shall be verified in two ways: (1) by measuring the analog :metry 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.

COMMANDS					
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13]	SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON					

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.)

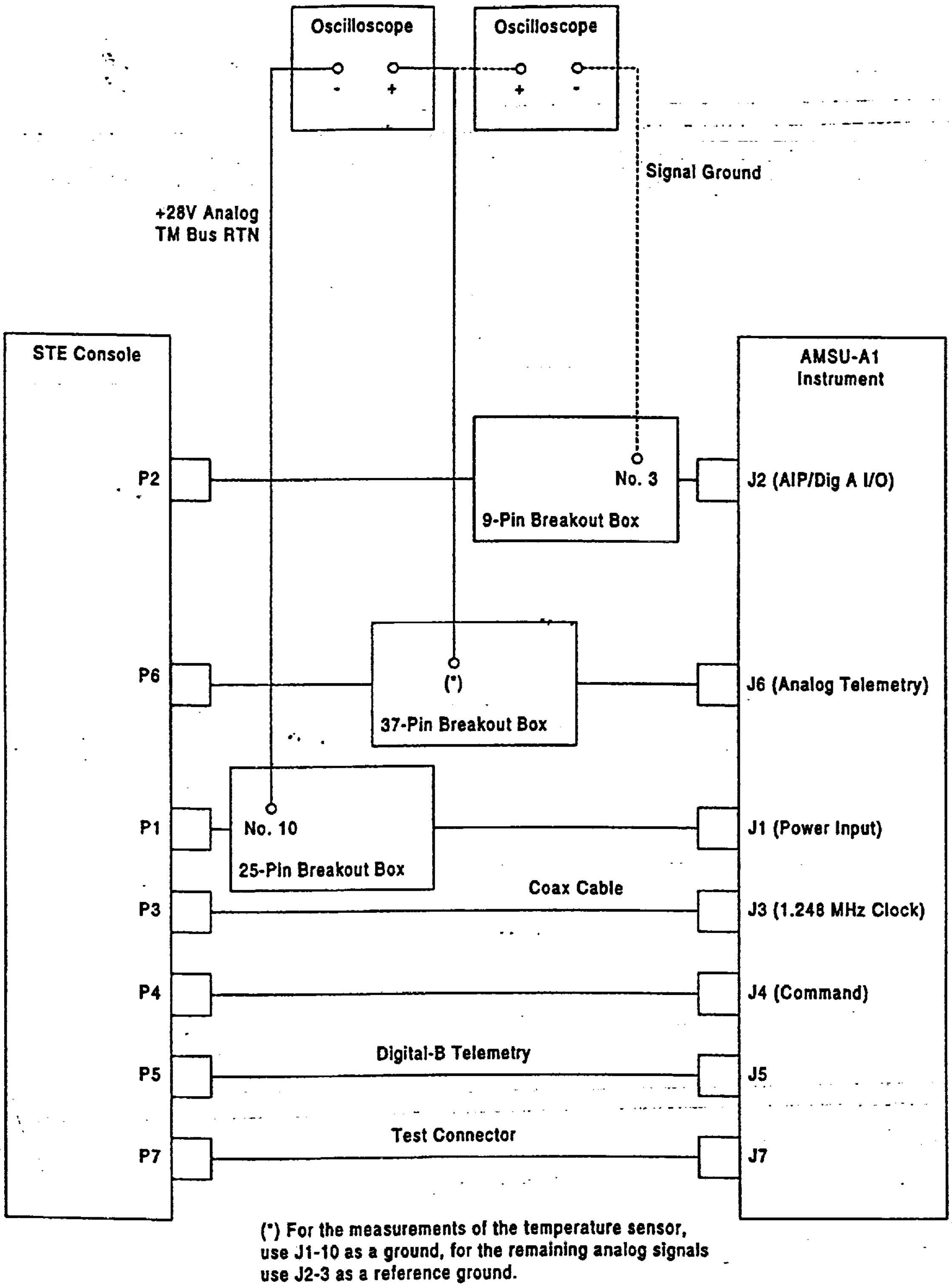


Figure 22. Analog Telemetry Signal Verification Test Setup

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 dump clock signal.

   (b) Channel-1 to J7-24 integration/hold clock signal.

   (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.

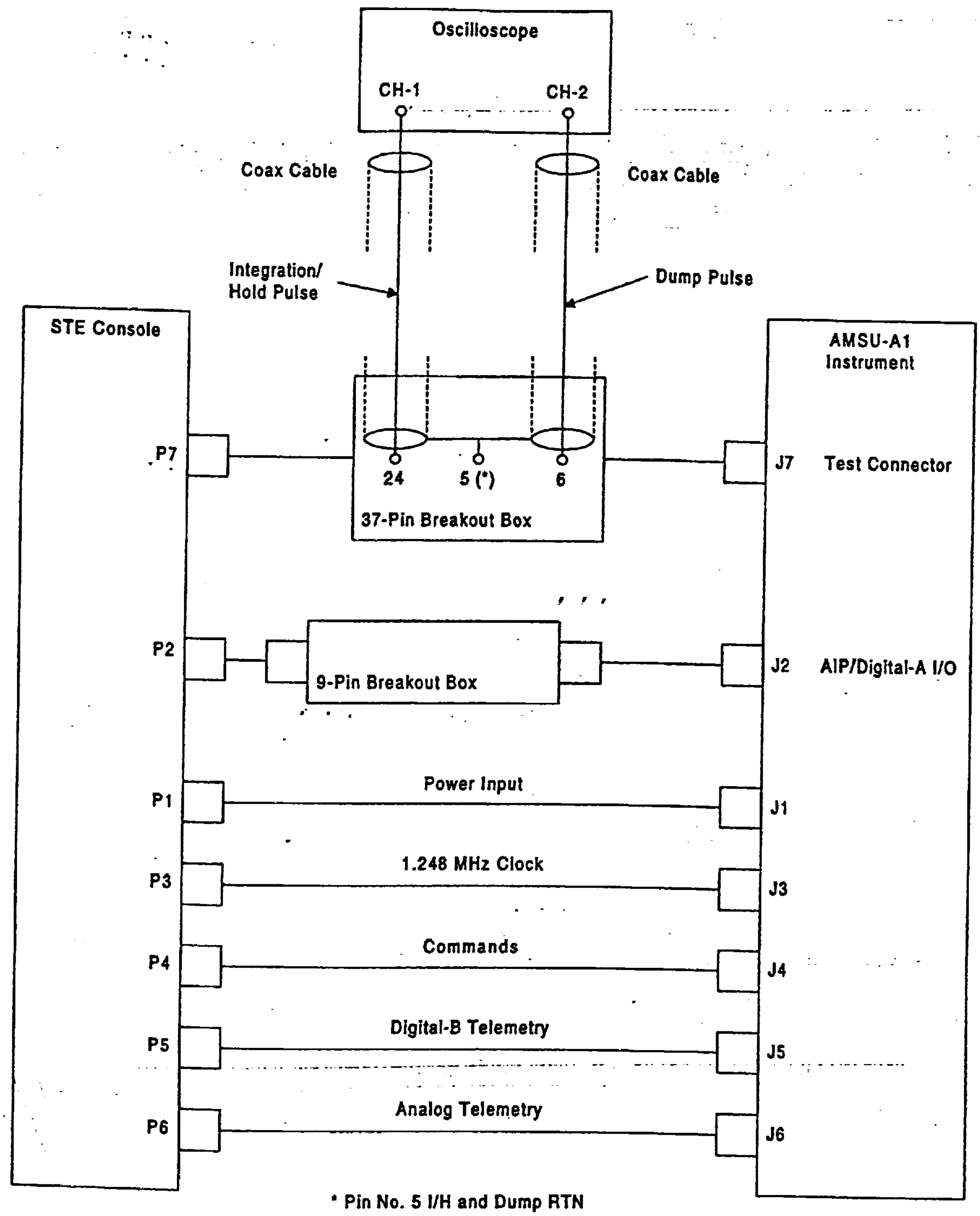


Figure 23. Integration/Hold and Dump Signals Verification Test Setup

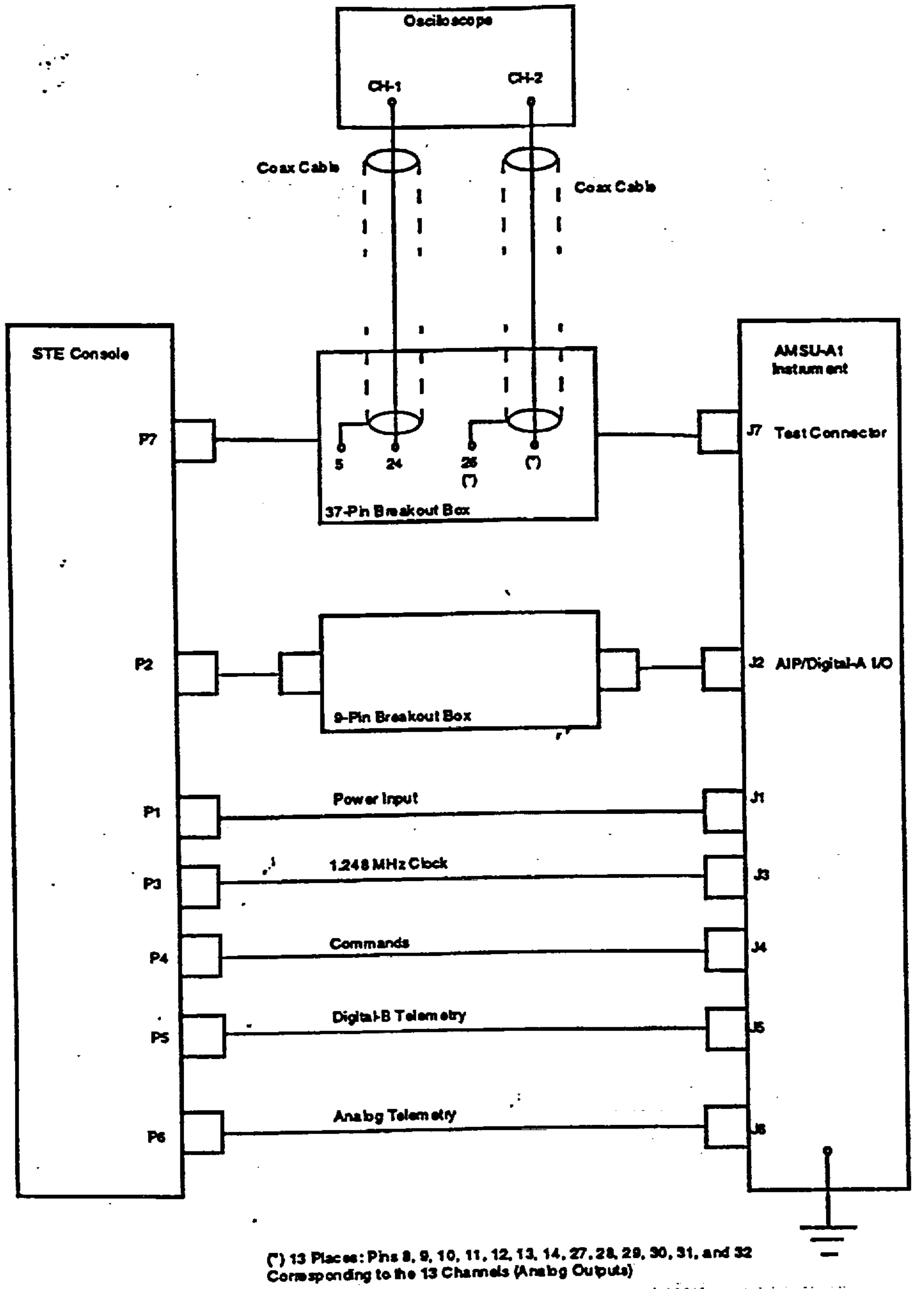


Figure 24. Integration Time (Analog Output) Verification Setup

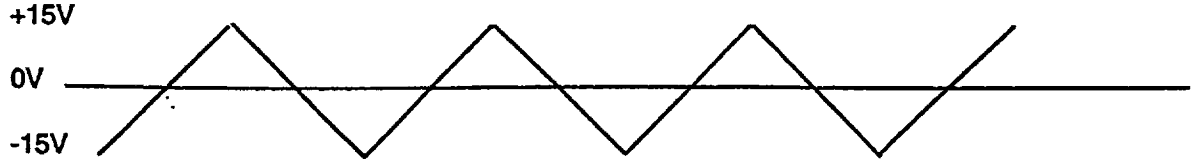
3.2.4.3.6.3 ***PLLO No. 1 verification.*** The PLLO No. 1 shall be verified as follows:

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:

   PLL POWER = 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:



   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.

Table III. Location and Frequency of Channel 3 through 15 Analog Outputs

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

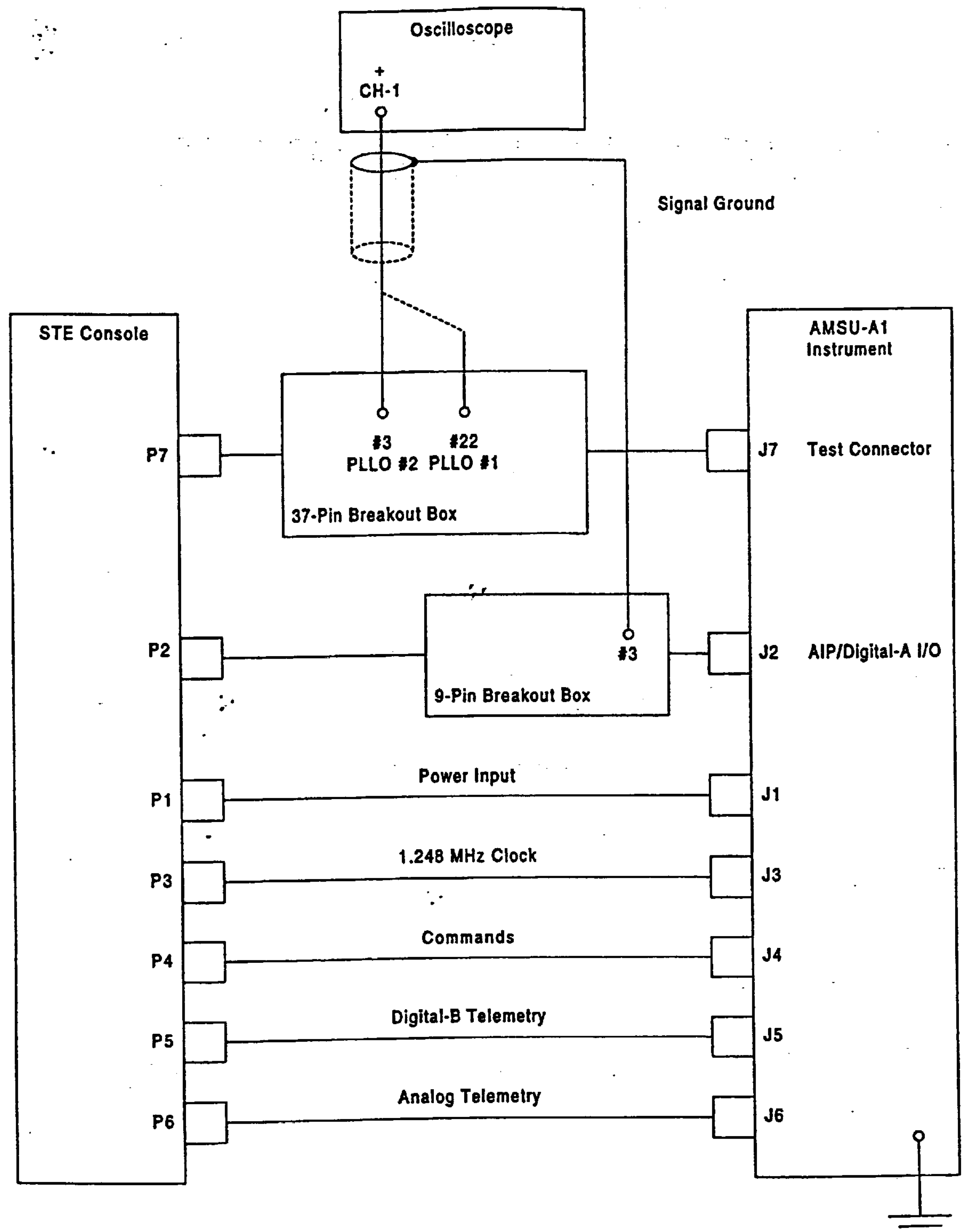


Figure 25. PLLO No. 1/No. 2 Test Setup

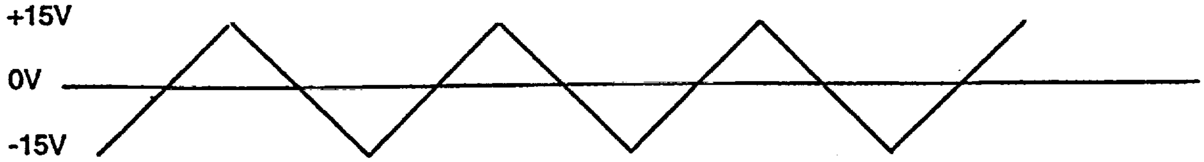
3.2.4.3.6.4 ***PLLO No. 2 verification*.** The PLLO No. 2 shall be verified as follows:

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:



   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.

5. Return to PLLO No. 1 by executing: PLL POWER = PLLO#1 [18]

6. Leave the unit turned on in preparation for the next test.

3.2.4.3.7 ***GSE mode verification*.** The purpose of this test is to verify the data obtained from the Ground Support Equipment (GSE), the following modes shall be evaluated. These modes are used for engineering evaluation only.

GSE-1 (Position: 10, 10, 10)

GSE-2 (Position: 1)

GSE-3 (Position: current)

GSE-4 (Position: 30)

GSE-5 (Position: 6)

GSE-7 (Position: required)

For GSE mode-1, the following parameters are subject to pass or fail criterion:

[I] Sync. sequence

[II] Unit ID and serial number

[III] Digital-B serial data verification

[IV] Reflector positions

[V] Radiometric data (Scene data) (Radiometric data will be limited to 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).

[VI] Temperature sensors.

For GSE 2 through 7, only the following parameters are subject to pass or fail criterion:

[IV] Reflector position.

[V] Radiometric data.

NOTE

Verification of GSE modes 2 through 7 are not required for the protoflight and flight instrument sensors since the modes are not used.

3.2.4.3.7.1 ***Equipment preparation and instrument turn-on procedure.*** To place instrument in GSE mode, proceed as follows:

1. Configure the test equipment as indicated in Figure 26.

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

COMMANDS				
[9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10] SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12] SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13] SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14] ANTENNA WARM CAL POS =	NO	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON			RETURN	[1]

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.

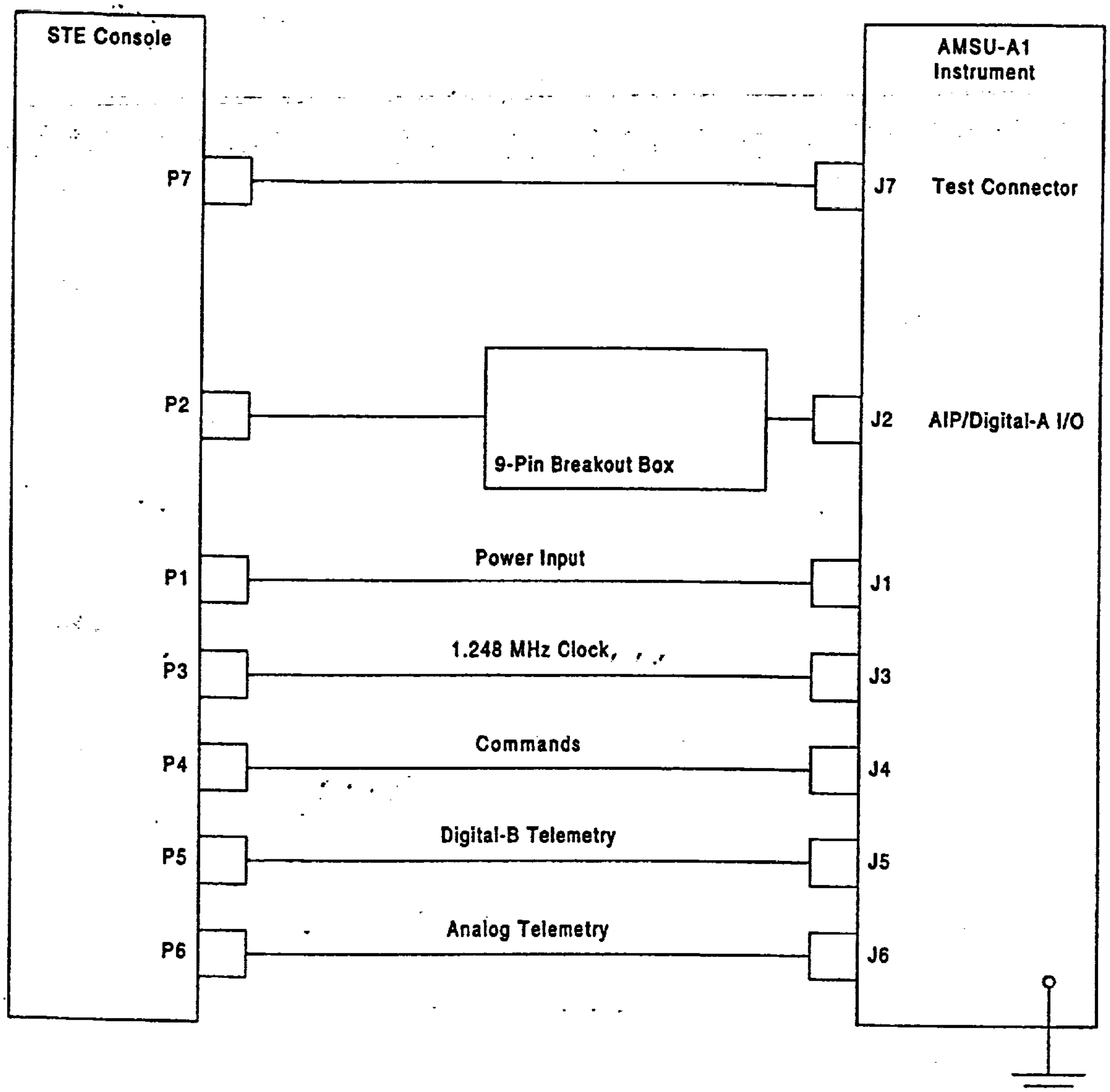


Figure 26. GSE Modes Verification Test

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] Reflector Positions

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 ([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 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 ([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 3 at the prompt.

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. 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 ([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 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.

.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 NEΔT 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

   (c) [16] ANTENNA NADIR POS = YES

   (d) [17] ANTENNA FULL SCAN MODE = NO

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.

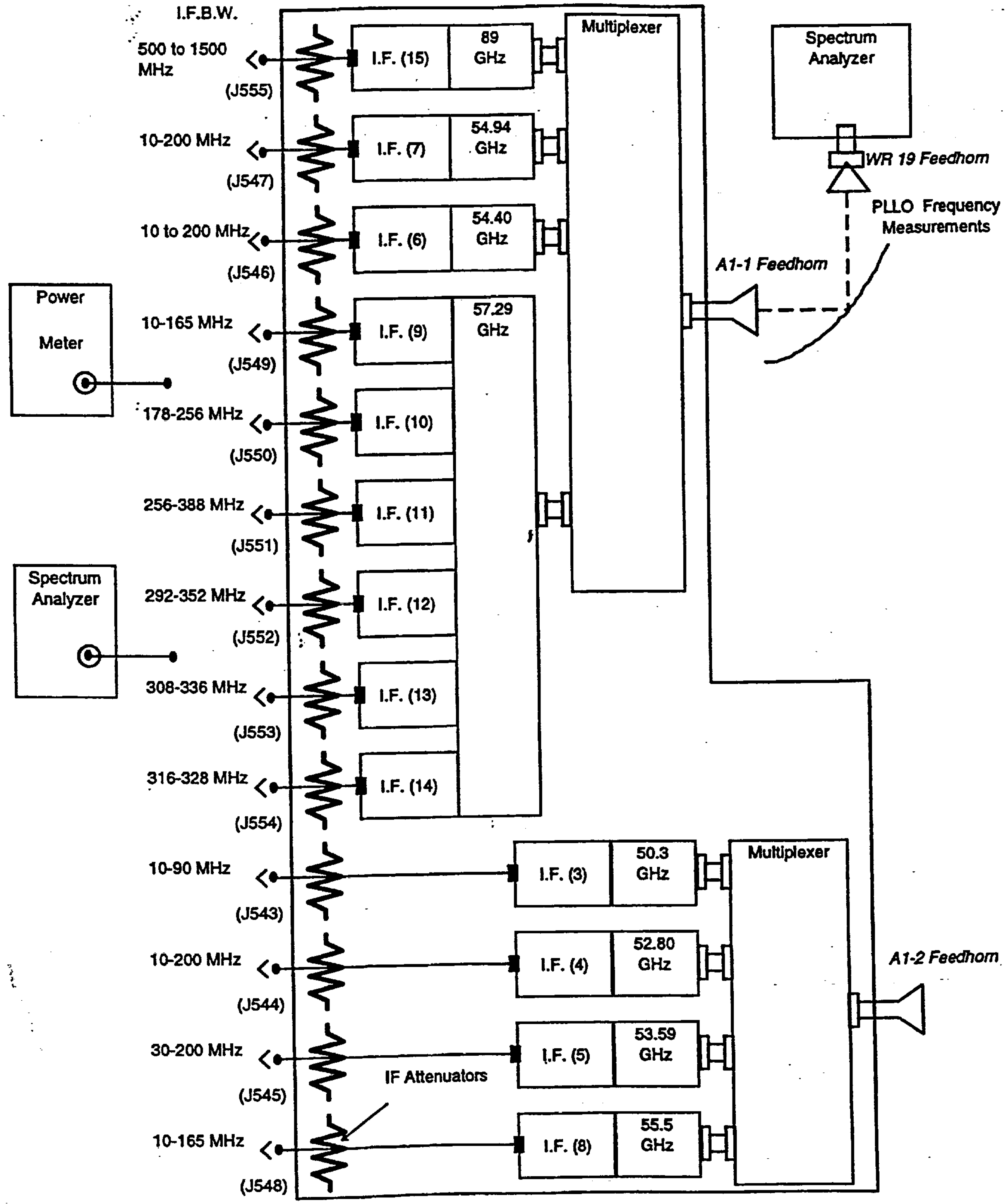


Figure 27. Configuration for RF Measurements

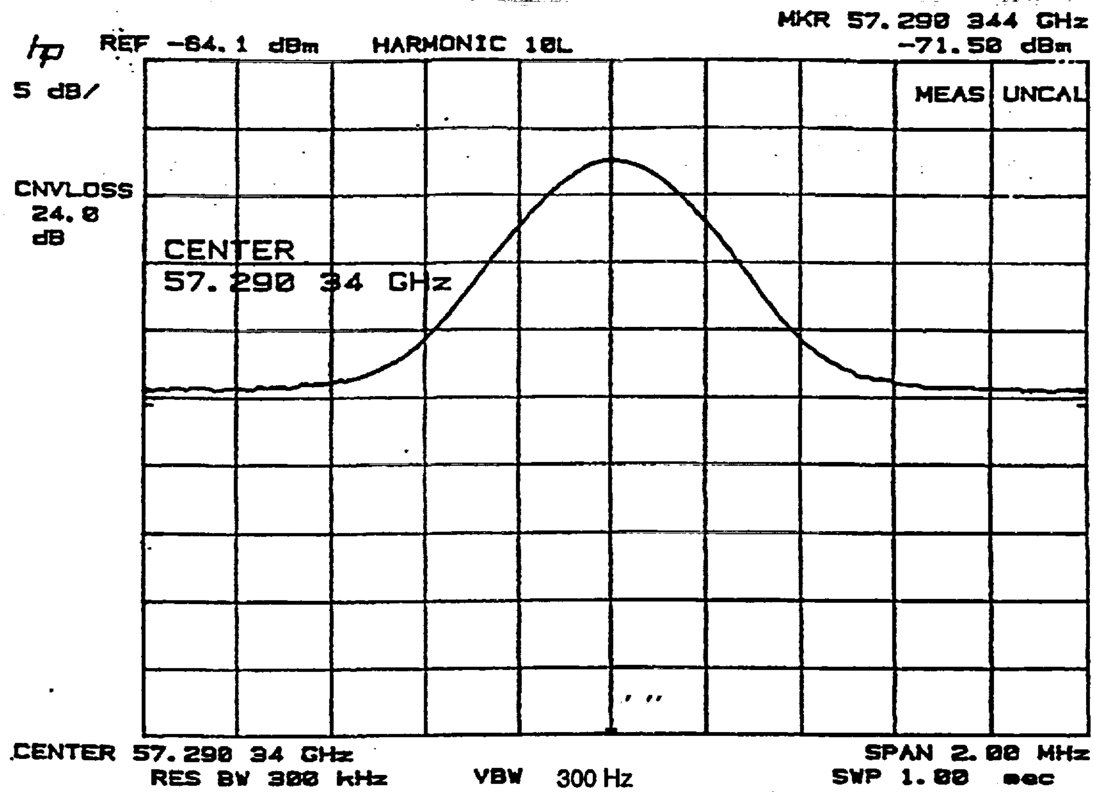


Figure 28. Sample Plot

3.2.4.4.2 *Relative radiometer NEΔT measurements*. The purpose of this test is to perform a preliminary evaluation of the radiometer NEΔT 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 NEΔT for this test, the temperature used for the cold load shall be LN_2 temperature.

The data obtained from this test are considered as relative NEΔT 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 NEΔT is as follows:

$$NE\Delta T = \frac{[SD \times (Th - Tc)]}{M - N}$$

where:

SD = Standard deviation of 120 samples at hot temperature (warm load)
Th = Standard room temperature = 300 K
Tc = Standard LN_2 temperature = 80 K
M = Average of hot counts (120 samples)
N = 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 NEΔT 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:

COMMANDS				
[9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10] SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12] SCANNER A1-1 POWER =	ON	PLL POWER =	PLLO#1	[18]
[13] SCANNER A1-2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[19]
[14] ANTENNA WARM CAL POS =	YES	COLD CAL POSITION LSB =	ZERO	[20]
POWER [4] ON				

3. Allow 30 minutes for the unit to stabilize.

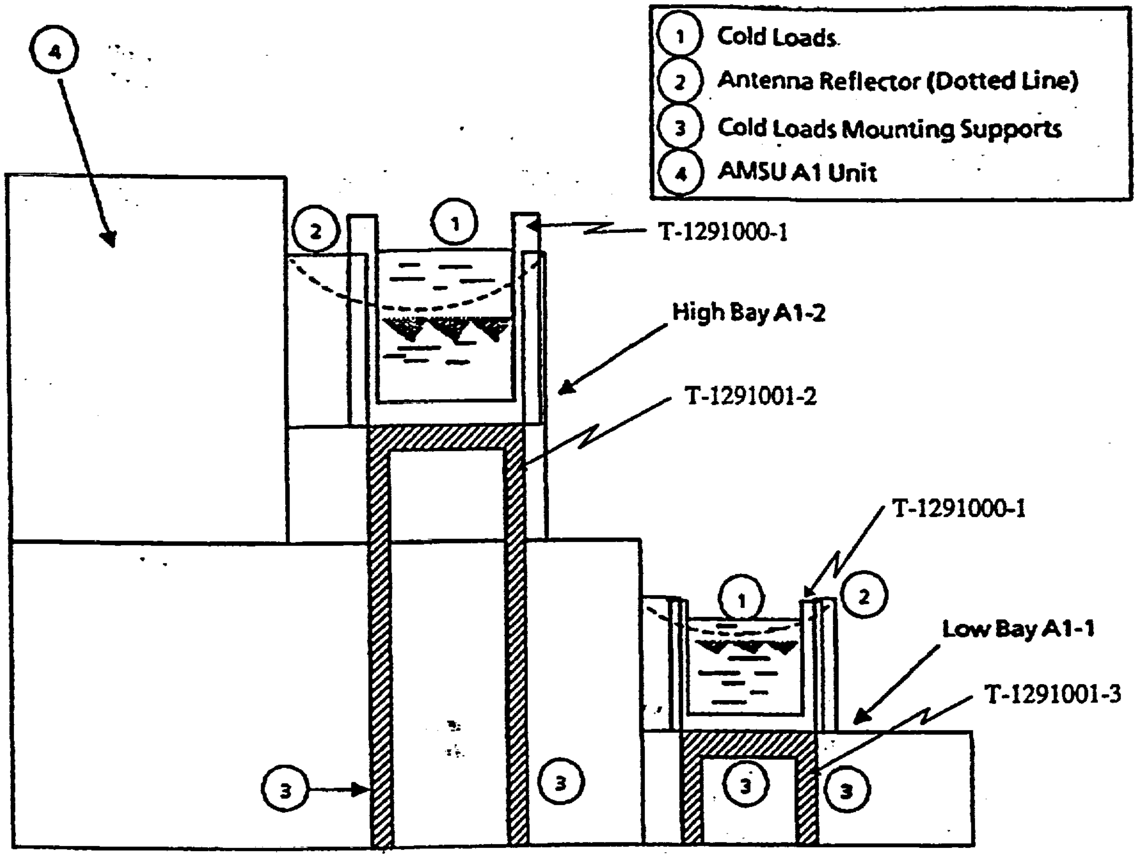


Figure 29. NEΔT Setup Configuration

3.2.4.4.2.2 *Relative NEΔT 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 NEΔT results are displayed on the screen. Obtain a printout. Repeat step 2 four times and obtain four additional printouts. Average NEΔT 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.

2.4.5 *Channel identification test.* The purpose of the channel identification test is to verify the proper final configuration ssembly 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 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.

<u>CAUTION</u>

> 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 52 of channel 3 from the printouts obtained in steps 10 and 14 and attach printouts to TDS 52.

17. Repeat steps 12 through 16 for the frequencies and polarizations listed on TDS 52.

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.

EOS	A1-03 E1.EXE;31 COLD CAL MODE			P15-JUN-98	09:36:59 SCAN NUMBER 34
[5]	SCIENCE DATA	ELEMENT	0000		
[6]	CONTROL/STATUS	ELEMENT	00		
[7]	ENGINEERING	ELEMENT	00		
[8]	DATA STREAM (64 VALUES)				
[9]	BEAM POSITION NN-ALL CHANNELS				
[10]	CHANNEL NN -ALL BEAM POSITIONS				
[11]	WARM CALIBRATE				
[12]	COLD CALILBRATE				
[13]	REFLECTOR POSITIONS				
[14]	TEMPERATURE DATA (16 VALUES)				
ENGR OK	POWER ON	CHECKSUM IN 15A1 SA28		34SA29	47
	SCREEN ONLY [2]			PRINT [3] FULL	[1] RETURN
SELECT BUTTON 2					

Figure 30. Digital-A Data Screen

EOS A1-03 E1.EXE;31 COLD CAL MODE P15-JUN-98 09:49:07 SCAN NUMBER 11

[5] SCIENCE DATA ELEMENT 0000

[6] CONTROL/STATUS ELEMENT 00

[7] ENGINEERING ELEMENT 00

RADIOMETRIC DATA

BEAM POSITION

CH	DATA	CH	DATA	CH	DATA
3	15798	8	15414	13	15811
4	16252	9	16176	14	16029
5	15661	10	16010	15	15102
6	16413	11	15639		
7	18044	12	15817		

[21] UP [22] DOWN

ENGR OK POWER ON CHECKSUM IN DF5D CALC DFSD SA28 11 SA29 14

SELECT BUTTON 2

Figure 31. Radiometric Data Screen

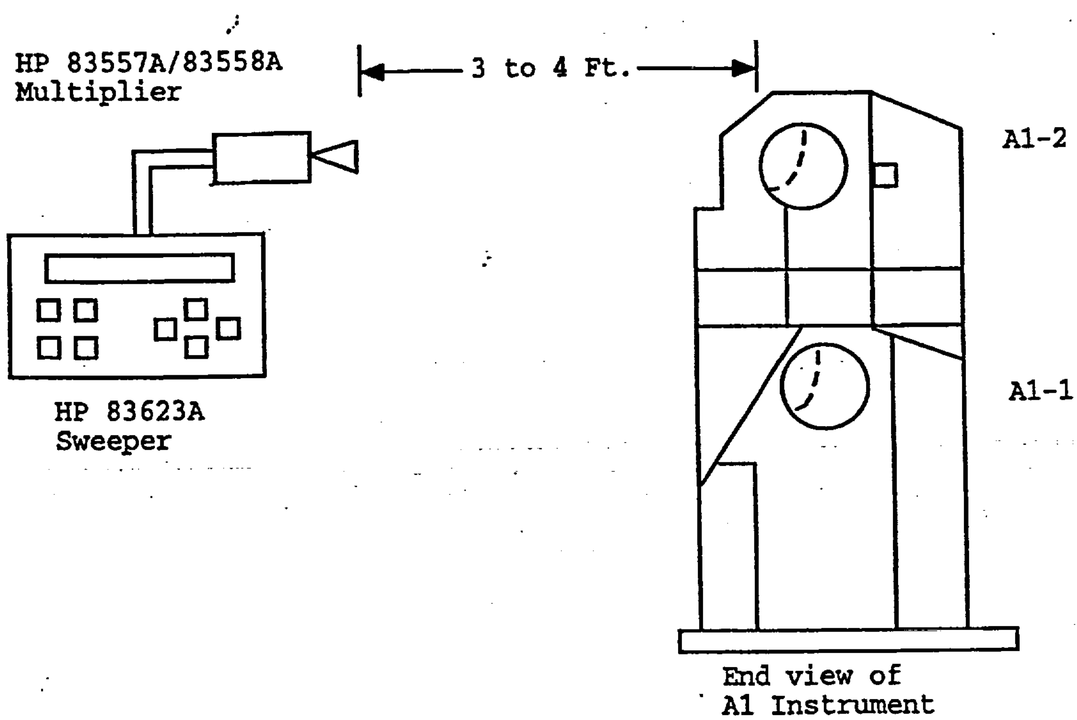


Figure 32. Channel Identification Setup

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 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*

AMSU	Advanced Microwave Sounding Unit
ATB	Analog telemetry bus
AWG	American Wire Gage
BP	Beam Position
CAL	Calibrate
CPT	Comprehensive performance test
d	delta
DC	Direct current
DVM	Digital volt meter
EMI	Electromagnetic interference
ESD	Electrostatic Sensitive Device
EXT	External
FAS	Failure analysis strategy
GHz	Gigahertz
GIIS	General Instrument Interface Specification
GND	Ground
GSE	Ground Support Equipment
HTR	Heater
kHz	Kilohertz
LPT	Limited performance test
LSB	Least significant bit
MA	Milliampere
METSAT	Meteorological Satellite
MLB	Main load bus
MFG	Manufacturer
MMW	Millimeter wave
MS, MSEC	Millisecond
MSB	Most significant bit
MV	Millivolt
NEΔT	Noise equivalent delta temperature
PFM	Protoflight Model
PLB	Pulse load bus
PLL	Phase lock loop
PLLO	Phase lock loop oscillator

POS	Position
PWR	Power
RTN	Return
STE	Special Test Equipment
SW	
TAR	Test Anomaly Record
TDS	Test Data Sheet
TLM	Telemetry
TM	Instrument Temperature
UIIS	Unique Instrument Interface Specification
Vdc	Volts, direct current
μs	Microsecond

6.2 *Changes*. The outside margins of this document have been marked to indicate where modifications, deletions, or additions have been made since the previous issue. This is done solely as a convenience to users, who are cautioned to evaluate the requirements of this document based on the entire content as written, regardless of the marginal notations and relationship to the previous issue.

APPENDIX A

TEST DATA SHEETS

10.1 *Scope.* This appendix contains the test data sheets for all tests and inspections listed in section 3.

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

J1 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	+28 V MLB	> 100k		
J1-2	+28 V MLB	> 100k		
J1-3	+28 V MLB RTN	> 100k		
J1-4	+28 V MLB RTN	> 100k		
J1-5	+28 V PLB	> 100k		
J1-6	+28 V PLB	> 100k		
J1-7	+28 V PLB RTN	> 100k		
J1-8	+28 V PLB RTN	> 100k		
J1-9	+28 V TMB	> 100k		
J1-10	28 V TMB RTN	> 100k		
J1-11	NO CONNECTION	> 100k		
J1-12	NO CONNECTION	> 100k		
J1-13	CHASSIS GROUND (E1)	< 1		
J1-14	+28 V MLB	> 100k		
J1-15	+28 V MLB	> 100k		
J1-16	+28 V MLB RTN	> 100k		
J1-17	+28 V MLB RTN	> 100k		
J1-18	+28 V PLB	> 100k		
J1-19	+28 V PLB	> 100k		
J1-20	+28 V PLB RTN	> 100k		
J1-21	+28 V PLB RTN	> 100k		
J1-22	+28 V TMB	> 100k		
J1-23	28 V TMB RTN	> 100k		
J1-24	SAFETY HTR PWR	> 100k		
J1-25	SAFETY HTR RTN	> 100k		

TEST DATA SHEET 1 (Sheet 2 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

J2 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-1	Chassis Ground (E2)	< 1		
J2-2	DATA CLOCK (C1)	> 100k		
J2-3	Signal Return	> 100k		
J2-4	No Connection	> 100k		
J2-5	DIGITAL-A DATA OUT	> 100k		
J2-6	DATA ENABLE (A1)	> 100k		
J2-7	8 SEC SYNC PULSE	> 100k		
J2-8	No Connection	> 100k		
J2-9	No Connection	> 100k		

J3 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J3-1	1.248 MHz CLK	> 100k		
J3-2	1.248 MHz CLK RTN	> 100k		
J3-3	Chassis GND (E3)	< 1		

J5 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J5-1	Chassis Ground (E5)	< 1		
J5-2	MODULE PWR IND	> 100k		
J5-3	COLD CAL POS MSB (OUT)	> 100k		
J5-4	No Connection	> 100k		
J5-5	SCANNER A1-2 ON/OFF	> 100k		
J5-6	ANT IN COLD CAL POS	> 100k		
J5-7	PLL PRI/RED	> 100k		
J5-8	No Connection	> 100k		
J5-9	SURV HTR ON/OFF	> 100k		
J5-10	No Connection	> 100k		
J5-11	COLD CAL POS LSB (OUT)	> 100k		
J5-12	SCANNER A1-1 ON/OFF	> 100k		
J5-13	ANT IN WARM CAL POS	> 100k		
J5-14	ANT IN NADIR POS	> 100k		
J5-15	FULL SCAN MODE	> 100k		

TEST DATA SHEET 1 (Sheet 3 of 9)
Grounding System Test (Paragraph 3.2.4.1)

J4 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J4-1	Chassis Ground (E4)	< 1		
J4-2	MODULE PWR DISCONN	> 100k		
J4-3	SURVIVAL HTR ON	> 100k		
J4-4	MODULE TOTALLY OFF	> 100k		
J4-5	SCANNER A1-2 ON/OFF	> 100k		
J4-6	ANT AT COLD CAL POS	> 100k		
J4-7	PLL SELECT	> 100k		
J4-8	ANT AT NADIR POS	> 100k		
J4-9	COLD CAL POS MSB (IN)	> 100k		
J4-10	No Connection	> 100k		
J4-11	No Connection	> 100k		
J4-12	+10 V INTERFACE BUS	> 100k		
J4-13	10 V INTERFACE BUS RTN	> 100k		
J4-14	MODULE PWR CONN	> 100k		
J4-15	SURVIVAL HTR OFF	> 100k		
J4-16	SCANNER A1-1 ON/OFF	> 100k		
J4-17	ANT AT WARM CAL POS	> 100k		
J4-18	FULL SCAN	> 100k		
J4-19	COLD CAL POS LSB (IN)	> 100k		
J4-20	No Connection	> 100k		
J4-21	No Connection	> 100k		
J4-22	No Connection	> 100k		
J4-23	No Connection	> 100k		
J4-24	+10 V INTERFACE BUS	> 100k		
J4-25	10 V INTERFACE BUS RTN	> 100k		

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

J6 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-1	Chassis GND (E6)	< 1		
J6-2	RF SHELF A1-1 TEMP	> 100k		
J6-3	A1-1 SCAN. MTR. TEMP	> 100k		
J6-4	WARM LOAD A1-1 TEMP	> 100k		
J6-5	No Connection	> 100k		
J6-6	PLLO RED LOCK DETECT	> 100k		
J6-7	No Connection	> 100k		
J6-8	A1-1 DRIVE MTR CURR	> 100k		
J6-9	+15 V ANT DR MON	> 100k		
J6-10	+5 V ANT DR MON	> 100k		
J6-11	+15 V SIG PROC MON	> 100k		
J6-12	+5 V SIG PROC MON	> 100k		
J6-13	L.O. VOLTAGE CH 3 MON	> 100k		
J6-14	L.O. VOLTAGE CH 5 MON	> 100k		
J6-15	L.O. VOLTAGE CH 7 MON	> 100k		
J6-16	+15 VDC PLL LO MON	> 100k		
J6-17	+10 V MIXER/AMP MON	> 100k		
J6-18	L.O. VOLTAGE CH 15 MON	> 100k		
J6-19	No Connection	> 100k		
J6-20	28 V TMB RTN	> 100k		
J6-21	RF SHELF A1-2 TEMP	> 100k		
J6-22	A1-2 SCAN MTR TEMP	> 100k		
J6-23	WARM LOAD A1-2 TEMP	> 100k		
J6-24	No Connection	> 100k		
J6-25	PLLO PRI LOCK DETECT	> 100k		
J6-26	No Connection	> 100k		
J6-27	A1-2 DRIVE MTR CURR	> 100k		
J6-28	-15 V ANT DR MON	> 100k		
J6-29	-15 V SIG PROC MON	> 100k		
J6-30	L.O. VOLTAGE CH 4 MON	> 100k		
J6-31	L.O. VOLTAGE CH 6 MON	> 100k		
J6-32	L.O. VOLTAGE CH 8 MON	> 100k		
J6-33	-15 VDC PLL LO MON	> 100k		
J6-34	+8 V IF AMP MON	> 100k		
J6-35	No Connection	> 100k		
J6-36	No Connection	> 100k		
J6-37	No Connection	> 100k		

TEST DATA SHEET 1 (Sheet 5 of 9)
Grounding System Test (Paragraph 3.2.4.1)

J7 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J7-1	Chassis GND (E7)	< 1		
J7-2	No Connection	> 100k		
J7-3	REDUN PLO LOCK DET	> 100k		
J7-4	15 V RTN (2/3)	> 100k		
J7-5	15 V RTN (2/3)	> 100k		
J7-6	DUMP TEST POINT	> 100k		
J7-7	No Connection	> 100k		
J7-8	CH3 OUT TEST POINT	> 100k		
J7-9	CH4 OUT TEST POINT	> 100k		
J7-10	CH5 OUT TEST POINT	> 100k		
J7-11	CH6 OUT TEST POINT	> 100k		
J7-12	CH7 OUT TEST POINT	> 100k		
J7-13	CH8 OUT TEST POINT	> 100k		
J7-14	CH9 OUT TEST POINT	> 100k		
J7-15	No Connection	> 100k		
J7-16	No Connection	> 100k		
J7-17	GSE CMD LSB	> 100k		
J7-18	GSE CMD MSB-1	> 100k		
J7-19	+5 V GSE INTERLOCK A	> 100k		
J7-20	No Connection	> 100k		
J7-21	No Connection	> 100k		
J7-22	PRI PLO LOCK DET	> 100k		
J7-23	No Connection	> 100k		
J7-24	I/H TEST POINT	> 100k		
J7-25	No Connection	> 100k		
J7-26	15 V RTN (2/3)	> 100k		
J7-27	CH10 OUT TEST POINT	> 100k		
J7-28	CH11 OUT TEST POINT	> 100k		
J7-29	CH12 OUT TEST POINT	> 100k		
J7-30	CH13 OUT TEST POINT	> 100k		
J7-31	CH14 OUT TEST POINT	> 100k		
J7-32	CH15 OUT TEST POINT	> 100k		
J7-33	No Connection	> 100k		
J7-34	No Connection	> 100k		
J7-35	GSE CMD MSB	> 100k		
J7-36	5 V RTN (1)	> 100k		
J7-37	+5 V GSE INTERLOCK B	> 100k		

TEST DATA SHEET 1 (Sheet 6 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	J1-2	+28 V MLB	< 1		
J1-1	J1-14	+28 V MLB	< 1		
J1-1	J1-15	+28 V MLB	< 1		
J1-3	J1-4	28 V MLB RTN	< 1		
J1-3	J1-16	28 V MLB RTN	< 1		
J1-3	J1-17	28 V MLB RTN	< 1		
J1-5	J1-6	+28 V PLB	< 1		
J1-5	J1-18	+28 V PLB	< 1		
J1-5	J1-19	+28 V PLB	< 1		
J1-7	J1-8	28 V PLB RTN	< 1		
J1-7	J1-20	28 V PLB RTN	< 1		
J1-7	J1-21	28 V PLB RTN	< 1		
J1-9	J1-22	+28 V TMB	< 1		
J1-10	J1-23	28 V TMB RTN	< 1		
J1-10	J6-20	28 V TMB RTN	< 1		
J4-12	J4-24	+10 V INTERFACE BUS	< 1		
J4-13	J4-25	10 V INTERFACE BUS RTN	< 1		
J1-1	J1-3	+28 V MLB	> 100k		
J1-1	J1-5	+28 V MLB	> 100k		
J1-1	J1-7	+28 V MLB	> 100k		
J1-1	J1-9	+28 V MLB	> 100k		
J1-1	J1-10	+28 V MLB	> 100k		
J1-1	J1-24	+28 V MLB	> 100k		
J1-1	J1-25	+28 V MLB	> 100k		
J1-1	J2-3	+28 V MLB	> 100k		
J1-1	J4-12	+28 V MLB	> 100k		
J1-1	J4-13	+28 V MLB	> 100k		
J1-3	J1-5	28 V MLB RTN	> 100k		
J1-3	J1-7	28 V MLB RTN	> 100k		
J1-3	J1-9	28 V MLB RTN	> 100k		
J1-3	J1-10	28 V MLB RTN	> 100k		
J1-3	J1-24	28 V MLB RTN	> 100k		
J1-3	J1-25	28 V MLB RTN	> 100k		
J1-3	J2-3	28 V MLB RTN	> 100k		
J1-3	J4-12	28 V MLB RTN	> 100k		
J1-3	J4-13	28 V MLB RTN	> 100k		

TEST DATA SHEET 1 (Sheet 7 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-5	J1-7	+28 V PLB	> 100k		
J1-5	J1-9	+28 V PLB	> 100k		
J1-5	J1-10	+28 V PLB	> 100k		
J1-5	J1-24	+28 V PLB	> 100k		
J1-5	J1-25	+28 V PLB	> 100k		
J1-5	J2-3	+28 V PLB	> 100k		
J1-5	J4-12	+28 V PLB	> 100k		
J1-5	J4-13	+28 V PLB	> 100k		
J1-7	J1-9	28 V PLB RTN	> 100k		
J1-7	J1-10	28 V PLB RTN	> 100k		
J1-7	J1-24	28 V PLB RTN	> 100k		
J1-7	J1-25	28 V PLB RTN	> 100k		
J1-7	J2-3	28 V PLB RTN	> 100k		
J1-7	J4-12	28 V PLB RTN	> 100k		
J1-7	J4-13	28 V PLB RTN	> 100k		
J1-9	J1-10	+28 V TMB	> 100k		
J1-9	J1-24	+28 V TMB	> 100k		
J1-9	J1-25	+28 V TMB	> 100k		
J1-9	J2-3	+28 V TMB	> 100k		
J1-9	J4-12	+28 V TMB	> 100k		
J1-9	J4-13	+28 V TMB	> 100k		
J1-10	J1-24	28 V TMB RTN	> 100k		
J1-10	J1-25	28 V TMB RTN	> 100k		
J1-10	J2-3	28 V TMB RTN	> 100k		
J1-10	J4-12	28 V TMB RTN	> 100k		
J1-10	J4-13	28 V TMB RTN	> 100k		
J1-24	J1-25	SAFETY HTR PWR	> 100k		
J1-24	J2-3	SAFETY HTR PWR	> 100k		
J1-24	J4-12	SAFETY HTR PWR	> 100k		
J1-24	J4-13	SAFETY HTR PWR	> 100k		
J1-25	J2-3	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-12	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-13	SAFETY HTR PWR RTN	> 100k		
J2-3	J4-12	SIGNAL RTN	> 100k		
J2-3	J4-13	SIGNAL RTN	> 100k		
J4-12	J4-13	+10 V INTERFACE BUS	> 100k		

TEST DATA SHEET 1 (Sheet 8 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-2	J4-13	DATA CLOCK (C1)	> 2k		
J2-5	J4-13	DIGITAL-A DATA OUT	> 2k		
J2-6	J4-13	DATA ENABLE (A1)	> 2k		
J2-7	J4-13	8 SEC SYNC PULSE	> 2k		
J3-1	J4-13	1.248 MHZ CLK	> 2k		
J3-2	J4-13	1.248 MHZ CLK RTN	> 2k		
J4-2	J4-13	MODULE PWR DISCONN	> 2k		
J4-3	J4-13	SURVIVAL HTR ON	> 2k		
J4-4	J4-13	MODULE TOTALLY OFF	> 2k		
J4-5	J4-13	SCANNER A1-2 ON/OFF	> 2k		
J4-6	J4-13	ANT AT COLD CAL POS	> 2k		
J4-7	J4-13	PLL SELECT	> 2k		
J4-8	J4-13	ANT AT NADIR POS	> 2k		
J4-9	J4-13	COLD CAL POS MSB (IN)	> 2k		
J4-14	J4-13	MODULE PWR CONN	> 2k		
J4-15	J4-13	SURVIVAL HTR OFF	> 2k		
J4-16	J4-13	SCANNER A1-1 ON/OFF	> 2k		
J4-17	J4-13	ANT AT WARM CAL POS	> 2k		
J4-18	J4-13	FULL SCAN	> 2k		
J4-19	J4-13	COLD CAL POS LSB (IN)	> 2k		
J5-2	J4-13	MODULE PWR IND	> 2k		
J5-3	J4-13	COLD CAL POS MSB (OUT)	> 2k		
J5-5	J4-13	SCANNER A1-2 ON/OFF	> 2k		
J5-6	J4-13	ANT IN COLD CAL POS	> 2k		
J5-7	J4-13	PLL PRI/RED	> 2k		
J5-9	J4-13	SURV HTR ON/OFF	> 2k		
J5-11	J4-13	COLD CAL POS LSB (OUT)	> 2k		
J5-12	J4-13	SCANNER A1-1 ON/OFF	> 2k		
J5-13	J4-13	ANT IN WARM CAL POS	> 2k		
J5-14	J4-13	ANT IN NADIR POS	> 2k		
J5-15	J4-13	FULL SCAN MODE	> 2k		

TEST DATA SHEET 1 (Sheet 9 of 9)
Grounding Interface Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-2	J1-10	RF SHELF A1-1 TEMP	> 2k		
J6-3	J1-10	A1-1 SCAN MTR.TEMP	> 2k		
J6-4	J1-10	WARM LOAD A1-1 TEMP	> 2k		
J6-6	J4-13	PLLO RED LOCK DETECT	> 2k		
J6-8	J4-13	A1-1 DRIVE MTR CVR	> 2k		
J6-9	J4-13	+15 VDC ANT DRIVE MON	> 2k		
J6-10	J4-13	+5 VDC ANT DRIVE MON	> 2k		
J6-11	J4-13	+15 VDC SIG PROC MON	> 2k		
J6-12	J4-13	+5VDC SIG PROC MON	> 2k		
J6-13	J4-13	L.O. VOLTAGE CH3 MON	> 2k		
J6-14	J4-13	L.O. VOLTAGE CH5 MON	> 2k		
J6-15	J4-13	L.O. VOLTAGE CH7 MON	> 2k		
J6-16	J4-13	+15 VDC PLL LO MON	> 2k		
J6-17	J4-13	+10 V MIXER/AMP MON	> 2k		
J6-18	J4-13	L.O. VOLTAGE CH15 MON	> 2k		
J6-21	J4-10	RF SHELF A1-2 TEMP	> 2k		
J6-22	J4-10	A1-2 SCAN MTR.TEMP	> 2k		
J6-23	J4-10	WARM LOAD A1-2 TEMP	> 2k		
J6-25	J4-13	PLLO PRI LOCK DETECT	> 2k		
J6-27	J4-13	A1-2 DRIVE MTR CURR	> 2k		
J6-28	J4-13	-15 VDC ANT DRIVE MON	> 2k		
J6-29	J4-13	-15 VDC SIG PROC MON	> 2k		
J6-30	J4-13	L.O. VOLTAGE CH4 MON	> 2k		
J6-31	J4-13	L.O. VOLTAGE CH6 MON	> 2k		
J6-32	J4-13	L.O. VOLTAGE CH8 MON	> 2k		
J6-33	J4-13	-15 VDC PLL LO MON	> 2k		
J6-34	J4-13	IF AMP MON	> 2k		

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:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	Required* S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	______ms	20 ms max	300 ms max	
8	Peak Current	______Amps	10.6 Amps	5.9 Amps	
10	Rate of Change (Slope): dI/dT	_____mA/µs	677 mA/µs	250 mA/µs	

At 27.44 Vdc:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	Required* S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	______ms	20 ms max	300 ms max	
8	Peak Current	______Amps	10.6 Amps	5.9 Amps	
10	Rate of Change (Slope): dI/dT	_____mA/µs	677 mA/µs	250 mA/µs	

At 28.00 Vdc:

Step	Parameter	Measured/ Calculated	Required* S/N 101-104	Required* S/N 105 & up	Pass/ Fail
7	Time to reach steady state current	______ms	20 ms max	300 ms max	
8	Peak Current	______Amps	10.6 Amps	5.9 Amps	
10	Rate of Change (Slope): dI/dT	_____mA/µs	677 mA/µs	250 mA/µs	

* 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)

Step	+28V MLB at 27 Volts	Measured	Units	Required	Pass/Fail
2	+28 V MLB voltage at 27 V (V_b) (Measured)		Volts	27.0 ± 0.1	
3	Average Current (I_V) (PLLO#1)		Amps	N/A	N/A
4	+28 V MLB operating power = I_V x V_b (PLLO#1)		Watts	82 W max	
6	Average current (I_V) (PLLO#2)		Amps	N/A	N/A
7	+28 V MLB operating power = I_V x V_b (PLLO#2)		Watts	82 W max	
	+28 V MLB at 28 Volts				
9	+28 V MLB bus voltage at 28 V (V_b) (Measured)		Volts	28.0 ± 0.1	
10	Average Current (I_V) (PLLO#1)		Amps	N/A	N/A
11	+28 V MLB operating power = I_V X V_b (PLLO#1)		Watts	82 W max	
13	Average current (I_V) (PLLO#2)		Amps	N/A	N/A
14	+28 V MLB operating power = I_V x V_b (PLLO#2)		Watts	82 W max	
	+28 V MLB at 29 Volts				
16	+28 V MLB voltage at 29 V (V_b) (Measured)		Volts	29.0 ± 0.1	
17	Average Current (I_V) (PLLO#1)		Amps	N/A	N/A
18	+28 V MLB operating power = I_V x V_b (PLLO#1)		Watts	82 W max	
20	Average current (I_V) (PLLO#2)		Amps	N/A	N/A
21	+28 V MLB operating power = I_V x V_b (PLLO#2)		Watts	82 W max	

Circle Test: CPT LPT

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

Test Systems Engineer Date

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TEST DATA SHEET 4 (Sheet 1 of 2)
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.6)

Paragraph	Parameter	Measured or Calculated	Required	Pass/ Fail
3.2.4.2.2.1	From -0.1 to two seconds			
	Peak Current = I_p	___Amps	1.3 amps max	
3.2.4.2.2.2	From 2 to 4 seconds			
	Peak Current = I_p	___Amps	1.3 amps max	
3.2.4.2.2.3	From 4 to 6 seconds			
	Peak Current = I_p	___Amps	1.3 amps max	
3.2.4.2.2.4	From 6 to 8 seconds			
	Peak Current = I_p	___Amps	1.3 amps max	
3.2.4.2.2.5	Eight Sec. Integrated Current Measurement:			
	Current	___mA	None	
3.2.4.2.2.6	Turn-on Transient:			
	dI/dT Peak Current = I_p	___mA/µs ___Amps	744 mA/µs * 11.5 Amps	

* Refer to Figure 9.

Bus current during the I/H, D period

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.1	From -0.1 to 2 secs	mA	N/A
3.2.4.2.2.2	From 2 to 4 secs	mA	N/A
3.2.4.2.2.3	From 4 to 6 secs	mA	N/A
3.2.4.2.2.5	From 6 to 8 secs	mA	N/A

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 4 (Sheet 2 of 2)
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.7)

Bus current during warm cal, cold cal, & Nadir

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.7 (2)	Warm cal	mA	N/A
3.2.4.2.2.7 (3)	Cold cal	mA	N/A
3.2.4.2.2.7 (4)	Nadir	mA	N/A
3.2.4.2.2.7 (5)	Warm cal (motors off)	mA	N/A

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)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	+28 V ATB Bus Voltage (V_{at}) (Measured)	____Volts	28.0 ±0.5	
4	Av. Current (I_a)	____mA	7 mA max	
5	+28 V ATB Operating Power = I_a X V_{at}	____mW	200 mW max	

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 6
+10 V Interface Bus Voltage (Paragraph 3.2.4.2.4)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	Av. Current (I_a)	____mA	10 mA max	
3	+10 V Interface Bus (V_{ib}) (Measured)	____Volts	9.0 ±1.0 V	
4	+10 V Interface Bus Power = I_a X V_{ib}	____mW	100 mW max	

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)

Step	Parameter	Measured	Units	Required	Pass/ Fail
3	+28 V MLB Voltage (Vb) (Measured at connector J1)		Volts	28 ±0.5	
3	Current		Amps	Between 0.5 and 4.3 Amps	

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 8
1.248 MHz Clock Signal Verification (Paragraph 3.2.4.3.2.1)

1.248 CLOCK SIGNAL
ATTACH PHOTOGRAPH OR PLOT HERE

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
5	Clock Frequency	____MHz	1.248 ±10%	
	Clock Amplitude	____Volts	9.0 ±1.0 V	

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 9

"C1" Shift Pulse Verification (Paragraph 3.2.4.3.2.2)

"C1" SHIFT PULSE
Attach Photograph OR Plot Here

Parameter	Measured/ Calculated	Required	Pass/ Fail
Pulse Timing (A) *	____μs	48 μs ± 10%	
Pulse Timing (B) *	____μs	12 μs ± 10%	
Pulse Amplitude	____Volts	9.0 ± 1.0 V	

* Refer to Figure 19 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
"A1" Select Pulse Verification (Paragraph 3.2.4.3.2.3)

"A1" SELECT PULSE
Attach Photograph or Plot Here

Parameter	Measured/ Calculated	Required	Pass/ Fail
Select Pulse Timing (F) *	____ μs	961.5 μs± 10%	
Select Pulse Amplitude	___ Volts	9.0 ±1.0 V	

* 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 (Flight Hardware Only) Date Quality Control Date

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)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
1*	Frame Sync Pulse Timing (G)*	___ Sec	8 Sec ±10%	
	Frame Sync Pulse Timing (C)*	___ µs	240.4 µs ±10%	
	Frame Sync Pulse Amplitude	___ Volts	9.0 ±1.0 V	

* 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 Shop Order: ________ S/N: ________

Test Systems Engineer Date

Customer Representative (Flight Hardware Only) Date

Quality Control Date

TEST DATA SHEET 12 (Sheet 1 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 8 seconds Frame sync pulse.

ATTACH PHOTOGRAPH OR PLOT HERE

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 Date (Flight Hardware Only)	Quality Control Date

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.

ATTACH PHOTOGRAPH OR PLOT HERE

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

TEST DATA SHEET 13
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 1.248 MHz clock.

ATTACH PHOTOGRAPH OR PLOT HERE

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

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

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)

Test	Digital-B Commands Verification Via STE			Visual Inspection		Pass/Fail
	Command	Observed	Required	Observed	Required	
3.2.4.3.3.1 Module Totally Off	Scanner A1-1		OFF		Antenna pointing to warm load.	
	Scanner A1-2		OFF		Antenna pointing to warm load.	
	Module Power		Disconnect	N/A	N/A	
	Survival Htr. Power.		OFF		28 V supply current=0	
3.2.4.3.3.2 Survival Heater Power	Survival Heater ON		ON	N/A	N/A	
	Survival Heater OFF		OFF	N/A	N/A	
3.2.4.3.3.3 Module Power Connect	Module Power		Connect		+28 V DC current is between 0.5 and 3.2 amps.	
3.2.4.3.3.4 PLL Power	PLLO#2		PLLO#2	N/A	N/A	
	PLLO#1		PLLO#1	N/A	N/A	

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)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A1 Power		ON	
	4 Scanner A2 Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 PLL Power		PLL#1	
	10 Cold MSB		0	
	11 Cold LSB		0	

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 16

Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 2)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A1 Power		OFF	
	4 Scanner A2 Power		OFF	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 PLL Power		PLLO#1	
	10 Cold MSB		0	
	11 Cold LSB		0	

Circle Test: CPT LPT

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

______________________________ Date
Test Systems Engineer

______________________________ Date
Customer Representative
(Flight Hardware Only)

______________________________ Date
Quality Control

TEST DATA SHEET 17
Scanner Commands Verification (Paragraph 3.2.4.3.3.5, Step 3)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A1 Power		ON	
	4 Scanner A2 Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 PLL Power		PLLO#1	
	10 Cold MSB		0	
	11 Cold LSB		0	

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 18

Scanner Positions Commands (Paragraph 3.2.4.3.3.6)

Test	Digital "B" Verification				Pass/Fail
	Step/Description		Observed	Required	
Scanner Position Commands	1-Warm Cal.			YES	
	2-Cold Cal. Pos.	MSB		0	
		LSB		1	
	3-Cold Cal. Pos.	MSB		1	
		LSB		0	
	4-Cold Cal. Pos.	MSB		1	
		LSB		1	
	5-Cold Cal. Pos.	MSB		0	
		LSB		0	
	6-NADIR			YES	
	7-Warm Cal			YES	

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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital-B Data Byte 1		2	
	0006	Digital-B Data Byte 2		**	
	0007	Digital-B Data Byte 3		0	
	0008	Digital-B Data Byte 4		0	

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

	Binary	Decimal
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

** 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)

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014				0016			
02	0048				0050			
03	0082				0084			
04	0116				0118			
05	0150				0152			
06	0184				0186			
07	0218				0220			
08	0252				0254			
09	0286				0288			
10	0320				0322			
11	0354				0356			
12	0388				0390			
13	0422				0424			
14	0456				0458			
15	0490				0492			
16	0524				0526			
17	0558				0560			
18	0592				0594			
19	0626				0628			
20	0660				0662			
21	0694				0696			
22	0728				0730			
23	0762				0764			
24	0796				0798			
25	0830				0832			
26	0864				0866			
27	0890				0900			
28	0932				0934			
29	0966				0968			
30	1000				1002			
CC	1034				1036			
WC	1186				1188			

* 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 21
Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
01	0018				0030			
02	0052				0064			
03	0086				0098			
04	0120				0132			
05	0154				0166			
06	0188				0200			
07	0222				0234			
08	0256				0268			
09	0290				0302			
10	0324				0336			
11	0356				0370			
12	0392				0404			
13	0426				0438			
14	0460				0472			
15	0494				0506			
16	0528				0540			
17	0562				0574			
18	0596				0608			
19	0630				0642			
20	0664				0676			
21	0698				0710			
22	0732				0744			
23	0766				0778			
24	0800				0812			
25	0834				0846			
26	0868				0880			
27	0902				0914			
28	0936				0948			
29	0970				0982			
30	1004				1016			
CC	1038				1050			
WC	1190				1202			

* 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

TEST DATA SHEET 22 (Sheet 1 of 2)
Full Scan Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.1)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1		25 ± 15	
1092	A1-1 Warm Load 2		25 ± 15	
1094	A1-1 Warm Load 3		25 ± 15	
1096	A1-1 Warm Load 4		25 ± 15	
1098	A1-1 Warm Load Center		25 ± 15	
1100	A1-2 Warm Load 1		25 ± 15	
1102	A1-2 Warm Load 2		25 ± 15	
1104	A1-2 Warm Load 3		25 ± 15	
1106	A1-2 Warm Load 4		25 ± 15	
1108	A1-2 Warm Load Center		25 ± 15	
1110	Local Oscillator Channel 7		25 ± 15	
1112	Local Oscillator Channel 8		25 ± 15	
1114	Local Oscillator Channel 15		25 ± 15	
1116	PLL LO #2 Channels 9-14		25 ± 15	
1118	PLL LO #1 Channels 9-14		25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***		25 ± 15	
1122	Mixer I.F. Amp. Channel 3		25 ± 15	
1124	Mixer I.F. Amp. Channel 4		25 ± 15	
1126	Mixer I.F. Amp. Channel 5		25 ± 15	
1128	Mixer I.F. Amp. Channel 6		25 ± 15	
1130	Mixer I.F. Amp. Channel 7		25 ± 15	
1132	Mixer I.F. Amp. Channel 8		25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14		25 ± 15	
1136	Mixer I.F. Amp. Channel 15		25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14		25 ± 15	
1140	I.F. Amp. Channel 9		25 ± 15	
1142	I.F. Amp. Channel 10		25 ± 15	
1144	I.F. Amp. Channel 11		25 ± 15	
1146	DC/DC Converter		25 ± 15	
1148	I.F. Amp. Channel 13		25 ± 15	
1150	I.F. Amp. Channel 14		25 ± 15	
1152	I.F. Amp. Channel 12		25 ± 15	
1154	RF Shelf A1-1		25 ± 15	
1156	RF Shelf A1-2		25 ± 15	
1158	Detector Preamp Assy.		25 ± 15	
1160	Scan Motor A1-1		25 ± 15	
1162	Scan Motor A1-2		25 ± 15	
1164	Feed Horn A1-1		25 ± 15	
1166	Feed Horn A1-2		25 ± 15	
1168	R.F. Mux A1-1		25 ± 15	
1170	R.F. Mux A1-2		25 ± 15	
1172	Local Oscillator Channel 3		25 ± 15	
1174	Local Oscillator Channel 4		25 ± 15	
1176	Local Oscillator Channel 5		25 ± 15	
1178	Local Oscillator Channel 6		25 ± 15	
1180	Temp Sensor Ref Voltage Count		**	

* 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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital-B Data Byte 1		4	
	0006	Digital-B Data Byte 2		14	
	0007	Digital-B Data Byte 3		0	
	0008	Digital-B Data Byte 4		0	

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

BP	A1-1 Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2			
15	3.2.4.3.4.4			

WC = Warm Cal
15 = Nadir Position

BP	A1-2 Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2			
15	3.2.4.3.4.4			

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)

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0018				0030			
02	0052				0064			
03	0086				0098			
04	0120				0132			
05	0154				0166			
06	0188				0200			
07	0222				0234			
08	0256				0268			
09	0290				0302			
10	0324				0336			
11	0356				0370			
12	0392				0404			
13	0426				0438			
14	0460				0472			
15	0494				0506			
16	0528				0540			
17	0562				0574			
18	0596				0608			
19	0630				0642			
20	0664				0676			
21	0698				0710			
22	0732				0744			
23	0766				0778			
24	0800				0812			
25	0834				0846			
26	0868				0880			
27	0902				0914			
28	0936				0948			
29	0970				0982			
30	1004				1016			
CC	1038		0		1050		0	
WC	1190		0		1202		0	

* 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

TEST DATA SHEET 26 (Sheet 1 of 2)
Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1		25 ± 15	
1092	A1-1 Warm Load 2		25 ± 15	
1094	A1-1 Warm Load 3		25 ± 15	
1096	A1-1 Warm Load 4		25 ± 15	
1098	A1-1 Warm Load Center		25 ± 15	
1100	A1-2 Warm Load 1		25 ± 15	
1102	A1-2 Warm Load 2		25 ± 15	
1104	A1-2 Warm Load 3		25 ± 15	
1106	A1-2 Warm Load 4		25 ± 15	
1108	A1-2 Warm Load Center		25 ± 15	
1110	Local Oscillator Channel 7		25 ± 15	
1112	Local Oscillator Channel 8		25 ± 15	
1114	Local Oscillator Channel 15		25 ± 15	
1116	PLL LO #2 Channels 9-14		25 ± 15	
1118	PLL LO #1 Channels 9-14		25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***			
1122	Mixer I.F. Amp. Channel 3		25 ± 15	
1124	Mixer I.F. Amp. Channel 4		25 ± 15	
1126	Mixer I.F. Amp. Channel 5		25 ± 15	
1128	Mixer I.F. Amp. Channel 6		25 ± 15	
1130	Mixer I.F. Amp. Channel 7		25 ± 15	
1132	Mixer I.F. Amp. Channel 8		25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14		25 ± 15	
1136	Mixer I.F. Amp. Channel 15		25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14		25 ± 15	
1140	I.F. Amp. Channel 9		25 ± 15	
1142	I.F. Amp. Channel 10		25 ± 15	
1144	I.F. Amp. Channel 11		25 ± 15	
1146	DC/DC Converter		25 ± 15	
1148	I.F. Amp. Channel 13		25 ± 15	
1150	I.F. Amp. Channel 14		25 ± 15	
1152	I.F. Amp. Channel 12		25 ± 15	
1154	RF Shelf A1-1		25 ± 15	
1156	RF Shelf A1-2		25 ± 15	
1158	Detector Preamp Assy.		25 ± 15	
1160	Scan Motor A1-1		25 ± 15	
1162	Scan Motor A1-2		25 ± 15	
1164	Feed Horn A1-1		25 ± 15	
1166	Feed Horn A1-2		25 ± 15	
1168	R.F. Mux A1-1		25 ± 15	
1170	R.F. Mux A1-2		25 ± 15	
1172	Local Oscillator Channel 3		25 ± 15	
1174	Local Oscillator Channel 4		25 ± 15	
1176	Local Oscillator Channel 5		25 ± 15	
1178	Local Oscillator Channel 6		25 ± 15	
1180	Temp Sensor Ref Voltage Count		**	

* 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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital-B Data Byte 1		8	
	0006	Digital-B Data Byte 2		14	
	0007	Digital-B Data Byte 3		0	
	0008	Digital-B Data Byte 4		0	

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

BP	A1-1 Reflector			
	Para No.	Position*	Required**	Pass/Fail
CC	3.2.4.3.4.3, Step 4			
	a.			
	b.			
	c.			
	d.			

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 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

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)

BP	A1-2 Reflector			
	Para No.	Position*	Required**	Pass/Fail
CC	3.2.4.3.4.3, Step 4			
	a.			
	b.			
	c.			
	d.			

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 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

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 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

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0018				0030			
02	0052				0064			
03	0086				0098			
04	0120				0132			
05	0154				0166			
06	0188				0200			
07	0222				0234			
08	0256				0268			
09	0290				0302			
10	0324				0336			
11	0356				0370			
12	0392				0404			
13	0426				0438			
14	0460				0472			
15	0494				0506			
16	0528				0540			
17	0562				0574			
18	0596				0608			
19	0630				0642			
20	0664				0676			
21	0698				0710			
22	0732				0744			
23	0766				0778			
24	0800				0812			
25	0834				0846			
26	0868				0880			
27	0902				0914			
28	0936				0948			
29	0970				0982			
30	1004				1016			
CC	1038		0		1050		0	
WC	1190		0		1202		0	

* 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

TEST DATA SHEET 30 (Sheet 1 of 2)
Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1		25 ± 15	
1092	A1-1 Warm Load 2		25 ± 15	
1094	A1-1 Warm Load 3		25 ± 15	
1096	A1-1 Warm Load 4		25 ± 15	
1098	A1-1 Warm Load Center		25 ± 15	
1100	A1-2 Warm Load 1		25 ± 15	
1102	A1-2 Warm Load 2		25 ± 15	
1104	A1-2 Warm Load 3		25 ± 15	
1106	A1-2 Warm Load 4		25 ± 15	
1108	A1-2 Warm Load Center		25 ± 15	
1110	Local Oscillator Channel 7		25 ± 15	
1112	Local Oscillator Channel 8		25 ± 15	
1114	Local Oscillator Channel 15		25 ± 15	
1116	PLL LO #2 Channels 9-14		25 ± 15	
1118	PLL LO #1 Channels 9-14		25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***			
1122	Mixer I.F. Amp. Channel 3		25 ± 15	
1124	Mixer I.F. Amp. Channel 4		25 ± 15	
1126	Mixer I.F. Amp. Channel 5		25 ± 15	
1128	Mixer I.F. Amp. Channel 6		25 ± 15	
1130	Mixer I.F. Amp. Channel 7		25 ± 15	
1132	Mixer I.F. Amp. Channel 8		25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14		25 ± 15	
1136	Mixer I.F. Amp. Channel 15		25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14		25 ± 15	
1140	I.F. Amp. Channel 9		25 ± 15	
1142	I.F. Amp. Channel 10		25 ± 15	
1144	I.F. Amp. Channel 11		25 ± 15	
1146	DC/DC Converter		25 ± 15	
1148	I.F. Amp. Channel 13		25 ± 15	
1150	I.F. Amp. Channel 14		25 ± 15	
1152	I.F. Amp. Channel 12		25 ± 15	
1154	RF Shelf A1-1		25 ± 15	
1156	RF Shelf A1-2		25 ± 15	
1158	Detector Preamp Assy.		25 ± 15	
1160	Scan Motor A1-1		25 ± 15	
1162	Scan Motor A1-2		25 ± 15	
1164	Feed Horn A1-1		25 ± 15	
1166	Feed Horn A1-2		25 ± 15	
1168	R.F. Mux A1-1		25 ± 15	
1170	R.F. Mux A1-2		25 ± 15	
1172	Local Oscillator Channel 3		25 ± 15	
1174	Local Oscillator Channel 4		25 ± 15	
1176	Local Oscillator Channel 5		25 ± 15	
1178	Local Oscillator Channel 6		25 ± 15	
1180	Temp Sensor Ref Voltage Count		**	

* 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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital-B Data Byte 1		16	
	0006	Digital-B Data Byte 2		14	
	0007	Digital-B Data Byte 3		0	
	0008	Digital-B Data Byte 4		0	

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

BP	A1-2 Channel-3 (50.3 GHz)				A1-1 Channel-9 (57.290344 GHz)			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
01	0018				0030			
02	0052				0064			
03	0086				0098			
04	0120				0132			
05	0154				0166			
06	0188				0200			
07	0222				0234			
08	0256				0268			
09	0290				0302			
10	0324				0336			
11	0356				0370			
12	0392				0404			
13	0426				0438			
14	0460				0472			
15	0494				0506			
16	0528				0540			
17	0562				0574			
18	0596				0608			
19	0630				0642			
20	0664				0676			
21	0698				0710			
22	0732				0744			
23	0766				0778			
24	0800				0812			
25	0834				0846			
26	0868				0880			
27	0902				0914			
28	0936				0948			
29	0970				0982			
30	1004				1016			
CC	1038		0		1050		0	
WC	1190		0		1202		0	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1		25 ± 15	
1092	A1-1 Warm Load 2		25 ± 15	
1094	A1-1 Warm Load 3		25 ± 15	
1096	A1-1 Warm Load 4		25 ± 15	
1098	A1-1 Warm Load Center		25 ± 15	
1100	A1-2 Warm Load 1		25 ± 15	
1102	A1-2 Warm Load 2		25 ± 15	
1104	A1-2 Warm Load 3		25 ± 15	
1106	A1-2 Warm Load 4		25 ± 15	
1108	A1-2 Warm Load Center		25 ± 15	
1110	Local Oscillator Channel 7		25 ± 15	
1112	Local Oscillator Channel 8		25 ± 15	
1114	Local Oscillator Channel 15		25 ± 15	
1116	PLL LO #2 Channels 9-14		25 ± 15	
1118	PLL LO #1 Channels 9-14		25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***		25 ± 15	
1122	Mixer I.F. Amp. Channel 3		25 ± 15	
1124	Mixer I.F. Amp. Channel 4		25 ± 15	
1126	Mixer I.F. Amp. Channel 5		25 ± 15	
1128	Mixer I.F. Amp. Channel 6		25 ± 15	
1130	Mixer I.F. Amp. Channel 7		25 ± 15	
1132	Mixer I.F. Amp. Channel 8		25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14		25 ± 15	
1136	Mixer I.F. Amp. Channel 15		25 ± 15	

* 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)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14		25 ± 15	
1140	I.F. Amp. Channel 9		25 ± 15	
1142	I.F. Amp. Channel 10		25 ± 15	
1144	I.F. Amp. Channel 11		25 ± 15	
1146	DC/DC Converter		25 ± 15	
1148	I.F. Amp. Channel 13		25 ± 15	
1150	I.F. Amp. Channel 14		25 ± 15	
1152	I.F. Amp. Channel 12		25 ± 15	
1154	RF Shelf A1-1		25 ± 15	
1156	RF Shelf A1-2		25 ± 15	
1158	Detector Preamp Assy.		25 ± 15	
1160	Scan Motor A1-1		25 ± 15	
1162	Scan Motor A1-2		25 ± 15	
1164	Feed Horn A1-1		25 ± 15	
1166	Feed Horn A1-2		25 ± 15	
1168	R.F. Mux A1-1		25 ± 15	
1170	R.F. Mux A1-2		25 ± 15	
1172	Local Oscillator Channel 3		25 ± 15	
1174	Local Oscillator Channel 4		25 ± 15	
1176	Local Oscillator Channel 5		25 ± 15	
1178	Local Oscillator Channel 6		25 ± 15	
1180	Temp Sensor Ref Voltage Count		**	

* 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)

	From	Description	To	Measured (volts)	Required (volts)	Pass/Fail
03	J6-02	RF Shelf A1-1 Temp.	J1-10	______	3.5 ± 2 V	______
01	J6-03	A1-1 Scan Motor Temp.	J1-10	______	3.5 ± 2 V	______
05	J6-04	Warm Load A1-1 Temp.	J1-10	______	3.5 ± 2 V	______
04	J6-21	RF Shelf A1-2 Temp.	J1-10	______	3.5 ± 2 V	______
02	J6-22	A1-2 Scan Motor Temp.	J1-10	______	3.5 ± 2 V	______
06	J6-23	Warm Load A1-2 Temp.	J1-10	______	3.5 ± 2 V	______
25	J6-06	PLLO No. 2 Lock detect	J2-03	______	***	______
07	J6-08	A1-1 Drive Motor Curr.	J2-03	______	3.5 ± 2 V	______
10	J6-09	+15 V Antenna Drive	J2-03	______	3.5 ± 2 V	______
15	J6-10	+5 V Antenna Drive	J2-03	______	3.5 ± 2 V	______
09	J6-11	+15 V Signal Processing	J2-03	______	3.5 ± 2 V	______
14	J6-12	+5 V Signal Processing	J2-03	______	3.5 ± 2 V	______
22	J6-13	L.O. Voltage Channel 3	J2-03	______	3.5 ± 2 V	______
24	J6-14	L.O. Voltage Channel 5	J2-03	______	3.5 ± 2 V	______
20	J6-15	L.O. Voltage Channel 7	J2-03	______	3.5 ± 2 V	______
16	J6-16	+15 V PLL LO Ch 9-14	J2-03	______	3.5 ± 2 V	______
17	J6-17	*	J2-03	______	3.5 ± 2 V	______
27	J6-18	L.O. Voltage Channel 15	J2-03	______	3.5 ± 2 V	______
26	J6-25	PLLO No. 1 Lock detect	J2-03	______	***	______
08	J6-27	A1-2 Drive Motor Curr.	J2-03	______	3.5 ± 2 V	______
12	J6-28	-15 V Antenna Drive	J2-03	______	3.5 ± 2 V	______
11	J6-29	-15 V Signal Processing	J2-03	______	3.5 ± 2 V	______
23	J6-30	L.O. Voltage Channel 4	J2-03	______	3.5 ± 2 V	______
21	J6-31	L.O. Voltage Channel 6	J2-03	______	3.5 ± 2 V	______
19	J6-32	L.O. Voltage Channel 8	J2-03	______	3.5 ± 2 V	______
18	J6-33	-15 V PLL LO Ch 9-14	J2-03	______	3.5 ± 2 V	______
13	J6-34	**	J2-03	______	3.5 ± 2 V	______

* +8.5 V PLL LO Ch 9-14 for S/N 101-104, +10V Mixer Amp for S/N 105 and above.
** +8 V Receiver for S/N 101-104, +8 V IF 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)

	Description	(*)	Measured (Deg. C)	Required (Deg. C)	Pass/Fail
01	A1-1 Scanner Motor	Temp	______	25 ± 15	______
02	A1-2 Scanner Motor	Temp	______	25 ± 15	______
03	A1-1 RF Shelf	Temp	______	25 ± 15	______
04	A1-2 RF Shelf	Temp	______	25 ± 15	______
05	A1-1 Warm Load	Temp	______	25 ± 15	______
06	A1-2 Warm Load	Temp	______	25 ± 15	______
			(mAmps)	(mAmps)	
07	Ant A1-1 Drv Motor Current		______	125 mA (Max)	______
08	Ant A1-2 Drv Motor Current		______	125 mA (Max)	______

(*) 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 Systems Engineer Date

____
Customer Representative (Flight Hardware Only) Date

____
Quality Control Date

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

	Description	(*)	Measured (volts)	Required (volts)	Pass/ Fail
09	Signal Processing	+15 V	______	15.0 ± 0.5 V	______
10	Antenna Drive	+15 V	______	15.0 ± 0.5 V	______
11	Signal Processing	-15 V	______	-15.0 ± 0.5 V	______
12	Antenna Drive	-15 V	______	-15.0 ± 0.5 V	______
13	Receiver	+8 V	______	8.0 ± 0.5 V	______
14	Sig Processing	+5 V	______	5.0 ± 0.5 V	______
15	Antenna Drive	+5 V	______	5.0 ± 0.5 V	______
16	Phase Lock Loop Ch 9-14 (a)/	+8.5 V	______	8.5 ± 0.5 V	______
	Receiver/Mixer IF (b)	+10 V	______	10.0 ±0.5 V	______
17	Phase Lock Loop Ch 9-14	+15 V	______	15.0 ± 0.5 V	______
18	Phase Lock Loop Ch 9-14	-15 V	______	-15.0 ± 0.5 V	______
19	L.O. #8	Ch-8	______	(**)__ ± 0.5 V	______
20	L.O. #7	Ch-7	______	(**)__ ± 0.5 V	______
21	L.O. #6	Ch-6	______	(**)__ ± 0.5 V	______
22	L.O. #3	Ch-3	______	(**)__ ± 0.5 V	______
23	L.O. #4	Ch-4	______	(**)__ ± 0.5 V	______
24	L.O. #5	Ch-5	______	(**)__ ± 0.5 V	______
25	PLLO No. 2 Lock Detect		______	(***)	______
26	PLLO No. 1 Lock Detect		______	(***)	______
27	L.O. #15	Ch-15	______	(**)__ ± 0.5 V	______

(*) 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 (Flight Hardware Only) 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

Parameter	Measured	Required	Pass/ Fail
Scope Channel-1: Integration/Hold			
Time Measured (A)*	ms	165 ms ± 10%	
Time Measured (B)*	ms	35 ms ± 10%	
Amplitude Measured	V	5.0 ± 0.2 V	
Scope Channel-2: Dump Signal			
Time Measured (D)*	ms	9 ms to 15 ms	
Amplitude Measured	V	5.0 ± 0.2 V	

* 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 37
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

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 ___________

ATTACH PHOTOGRAPH OR PLOT HERE

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

TEST DATA SHEET 38

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

Channel ________05
Frequency: ____________53.596 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 ________06
Frequency: ____________54.4 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 39

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

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 ___________

ATTACH PHOTOGRAPH OR PLOT HERE

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 ___________

* 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 40
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

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 ___________

ATTACH PHOTOGRAPH OR PLOT HERE

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.

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)

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)

ATTACH PHOTOGRAPH OR PLOT HERE

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 __________

ATTACH PHOTOGRAPH OR PLOT HERE

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 (Flight Hardware Only) Date

Quality Control Date

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

ATTACH PHOTOGRAPH OR PLOT HERE

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 (Flight Hardware Only) Date

____
Quality Control Date

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)

PLLO NO. 1

PLLO No. 1 dc Level ______________ Required: * Pass/Fail ______

PLLO NO. 2

PLLO No. 2 dc Level ______________ Required: * Pass/Fail ______

* -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: __________ 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)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital-B Data Byte 1		0	
	0006	Digital-B Data Byte 2		14	
	0007	Digital-B Data Byte 3		0	
	0008	Digital-B Data Byte 4		0	

* AMSU A1 Identification Words (data entered in decimal system)	Binary	Decimal
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 46 (Sheet 1 of 2)
Reflector Position (Paragraphs 3.2.4.3.7.2 - 3.2.4.3.7.7)

3.2.4.3.7.2 Digital-A/GSE Mode-1 Reflector Position Section [IV] ***

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
06	0184				0186			
CC	354				356			
WC	694				696			

3.2.4.3.7.3 Digital-A/GSE Mode-2 Reflector Position Section [IV] ***

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
01	0014				0016			

3.2.4.3.7.4 Digital-A/GSE Mode-3 Reflector Position Section [IV] ***

A1-1 Reflector			A1-2 Reflector		
Observed	Required**	Pass/Fail	Observed	Required**	Pass/Fail
	****			****	

* 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.

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 46 (Sheet 2 of 2)
Reflector Position (Paragraphs 3.2.4.3.7.2 - 3.2.4.3.7.7)

3.2.4.3.7.5 Digital-A/GSE Mode-4 Reflector Position Section [IV] ***

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
30	1000				1002			

3.2.4.3.7.6 Digital-A/GSE Mode-5 Reflector Position Section [IV] ***

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
06	0184				0186			

3.2.4.3.7.7 Digital-A/GSE Mode-7 Reflector Position Section [IV] ***

BP	A1-1 Reflector				A1-2 Reflector			
	Element (For Ref)	Position*	Required**	Pass/Fail	Element (For Ref)	Position*	Required**	Pass/Fail
06	0184				0186			

* 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

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 47

Digital-A/GSE Mode-1 Radiometer Data Section [V] (Paragraph 3.2.4.3.7.2)

BP	A1-1 Reflector			A1-2 Reflector		
	Channel-3*	Required**	Pass/Fail	Channel-9*	Required**	Pass/Fail
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

* 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

TEST DATA SHEET 48 (Sheet 1 of 2)
Digital-A/GSE Mode-1 Temperature Sensors Section [VI] (Paragraph 3.2.4.3.7.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1090	A1-1 Warm Load 1		25 ± 15	
1092	A1-1 Warm Load 2		25 ± 15	
1094	A1-1 Warm Load 3		25 ± 15	
1096	A1-1 Warm Load 4		25 ± 15	
1098	A1-1 Warm Load Center		25 ± 15	
1100	A1-2 Warm Load 1		25 ± 15	
1102	A1-2 Warm Load 2		25 ± 15	
1104	A1-2 Warm Load 3		25 ± 15	
1106	A1-2 Warm Load 4		25 ± 15	
1108	A1-2 Warm Load Center		25 ± 15	
1110	Local Oscillator Channel 7		25 ± 15	
1112	Local Oscillator Channel 8		25 ± 15	
1114	Local Oscillator Channel 15		25 ± 15	
1116	PLL LO #2 Channels 9-14		25 ± 15	
1118	PLL LO #1 Channels 9-14		25 ± 15	
1120	PLLO (Reference Oscillator)**/ Not used ***			
1122	Mixer I.F. Amp. Channel 3		25 ± 15	
1124	Mixer I.F. Amp. Channel 4		25 ± 15	
1126	Mixer I.F. Amp. Channel 5		25 ± 15	
1128	Mixer I.F. Amp. Channel 6		25 ± 15	
1130	Mixer I.F. Amp. Channel 7		25 ± 15	
1132	Mixer I.F. Amp. Channel 8		25 ± 15	
1134	Mixer I.F. Amp. Channels 9-14		25 ± 15	
1136	Mixer I.F. Amp. Channel 15		25 ± 15	

* 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-1 Temperature Sensors Section [VI] (Paragraph 3.2.4.3.7.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
1138	I.F. Amp. Channel 11-14		25 ± 15	
1140	I.F. Amp. Channel 9		25 ± 15	
1142	I.F. Amp. Channel 10		25 ± 15	
1144	I.F. Amp. Channel 11		25 ± 15	
1146	DC/DC Converter		25 ± 15	
1148	I.F. Amp. Channel 13		25 ± 15	
1150	I.F. Amp. Channel 14		25 ± 15	
1152	I.F. Amp. Channel 12		25 ± 15	
1154	RF Shelf A1-1		25 ± 15	
1156	RF Shelf A1-2		25 ± 15	
1158	Detector Preamp Assy.		25 ± 15	
1160	Scan Motor A1-1		25 ± 15	
1162	Scan Motor A1-2		25 ± 15	
1164	Feed Horn A1-1		25 ± 15	
1166	Feed Horn A1-2		25 ± 15	
1168	R.F. Mux A1-1		25 ± 15	
1170	R.F. Mux A1-2		25 ± 15	
1172	Local Oscillator Channel 3		25 ± 15	
1174	Local Oscillator Channel 4		25 ± 15	
1176	Local Oscillator Channel 5		25 ± 15	
1178	Local Oscillator Channel 6		25 ± 15	
1180	Temp Sensor Ref Voltage Count		**	

* 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 49
Receiver Input Signals (Paragraph 3.2.4.4.1)

CH 9 through 14 PLLO	PRT Temp (°C)		Measured * Frequency	Requirements **	Pass/ Fail
PLLO No. 1	PLO No. 1	Xtal *** Osc.		57290.334 MHz ± 50 kHz	
PLLO No. 2	PLO No. 2	Xtal *** Osc.		57290.334 MHz ± 50 kHz	

* 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

TEST DATA SHEET 50 (Sheet 1 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

Channels 3, 4, 5, 6, 7, 8, and 15. PLLO No. 1 (Channels 9 through 14)

Channel Number>	3	4	5	6
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	____ ____ 0.40	____ ____ 0.25	____ ____ 0.25	____ ____ 0.25
Channel Number>	7	8	9	10
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	____ ____ 0.25	____ ____ 0.25	____ ____ 0.25	____ ____ 0.40
Channel Number>	11	12	13	14
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	____ ____ 0.40	____ ____ 0.60	____ ____ 0.80	____ ____ 1.20
Channel Number>	15			
NEΔT (Average of 5 data) Pass/Fail NEΔT (Specified) K **	____ ____ 0.50			

* 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

TEST DATA SHEET 50 (Sheet 2 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

PLLO No. 2 (Channels 9 through 14)

Channel Number>	9	10	11	12
NEΔT (Average of 5 data)	______	______	______	______
Pass/Fail	______	______	______	______
NEΔT (Specified) K **	0.25	0.40	0.40	0.60
Channel Number>	13	14		
NEΔT (Average of 5 data)	______	______		
Pass/Fail	______	______		
NEΔT (Specified) K **	0.80	1.20		

* 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

Electronic Systems Plant
P.O. Box 296
Azusa, California 91702-0296
CAGE/Facility Ident: 70143

GENCORP
AEROJET

AE-26151/5E
11 February 1999

Superseding
AE-26151/5D
22 September 1998

PROCESS SPECIFICATION

TEST PROCEDURE, ELECTROMAGNETIC INTERFERENCE (EMI)/ ELECTROMAGNETIC RADIATION (EMR) AND ELECTROMAGNETIC COMPATIBILITY (EMC) FOR THE METSAT/METOP ADVANCED MICROWAVE SOUNDING UNIT–A (AMSU-A)

Contract No.: NAS5-32314

Prepared for:

NASA/Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

TABLE OF CONTENTS

FIGURES

TABLES

TEST DATA SHEETS

1. SCOPE

This document establishes the general methods and procedures for electromagnetic interference (EMI), electromagnetic radiation (EMR), and electromagnetic compatibility (EMC) testing of the Meteorological Satellite (METSAT) Advanced Microwave Sounding Unit - A (AMSU-A). The test requirements, test conditions, and procedures herein are in accordance with the applicable detail specification sheets and use the standard techniques of MIL-STD-461 and MIL-STD-462 as modified by General Instrument Interface Specification (GIIS) IS-3267415, paragraph 3.6.

1.1 ***Purpose.*** The purpose of this test procedure is to define the methods and procedures to be used to demonstrate compliance of the AMSU-A instrument with the applicable specification requirements. In this document, the test facilities, equipment, and conditions are identified, the performance criteria are defined, and step-by-step test procedures are included. Table I lists the test methods to be used and cross references the paragraphs in the requirements documents that will be satisfied by these methods and by performance of the test procedures herein.

Table I. Compliance Matrix

Test Method	Paragraph	S-480-79 Appendix D	IS-2617547	IS-2624483	IS-3267415
CE01* 2/	3.4.5	3.5.2.1	3.4.2	3.4.2	3.6.1.1
CE03 2/	3.4.5	3.5.2.1	3.4.2	3.4.2	3.6.1.1
RE02 1/ 2/	3.4.6	3.5.2.1	3.4.2	3.4.2	3.6.1.4.2
RE04**	3.4.7	3.5.2.1	3.4.1	3.4.1	3.5.2
CS01	3.4.8	3.5.2.1	3.4.2	3.4.2	3.6.1.2
CS02 2/	3.4.9	3.5.2.1	3.4.2	3.4.2	3.6.1.2
CS06 2/	3.4.10	3.5.2.1	3.4.2	3.4.2	3.6.1.3
RS03 2/	3.4.11	3.5.2.1	3.4.2	3.4.2	3.6.1.5

* No emanation in the frequency range specified by this test method are present in the test sample.

** No AC emanation in the frequency range specified by this test method are present in the test sample.

1/ For Acceptance Test only. Perform electric field radiation frequency range 2010-2040 MHz (para. 3.4.6) and frequency range of Table IV.

2/ Comply with METOP specifications MO-IC-MMT-A1-0001 (AMSU-A1) and MO-IC-MMT-A2-0001 (AMSU-A2), and per Table A-III requirements.

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2. APPLICABLE DOCUMENTS

2.1 *Government documents*. The following documents of the exact issue shown, form a part of this specification to the extent specified herein.

2.1.1 *NASA-Goddard Space Flight Center (GSFC)*

SPECIFICATIONS

S-480-79	Performance and Operation Specification for the Advanced Microwave Sounding Unit (AMSU)
S-480-80	Performance Assurance Requirements for the Advanced Microwave Sounding Unit (AMSU)

OTHER DOCUMENTS

MO-IC-MMT-A1-0001	Advanced Microwave Sounding Unit-A1, Instrument Interface Control Document (METOP)
MO-IC-MMT-A2-0001	Advanced Microwave Sounding Unit-A2, Instrument Interface Control Document (METOP)
RCA-IS-2617547	Unique Instrument Interface Specification for the Advanced Microwave Sounding Unit Module A1 (AMSU-A1) (UIIS)
RCA-IS-2624483	Unique Interface Specification for the Advanced Microwave Sounding Unit A2 (AMSU-A2) (UIIS)
RCA-IS-3267415	ATN-KLM General Interface Specification (GIIS)

2.1.2 *Military*

SPECIFICATIONS

MIL-B-5087B Interim Amendment. 3 24 Dec 84	Bonding, Electrical, and Lightning Protection, for Aerospace Systems

STANDARDS

MIL-STD-461C 8 Aug 86	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-462 Notice 6 15 Oct 87	Electromagnetic Interference Characteristics, Measurement of
MIL-STD-463A 01 Jun 77	Definitions and System of Units, Electromagnetic Interference and Electromagnetic Compatibility Technology

MIL-STD-45662 Notice 3 14 Dec 84	Calibration Systems Requirements

(Copies of military documents required by suppliers in connection with specific procurement functions should be obtained as indicated in the Department of Defense Index of Specifications 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 exact issue shown shall apply.

2.2.1 ***Aerojet documents***

SPECIFICATIONS

AE-26156/3	AMSU-A1 System, Comprehensive Performance Test and Limited Performance Test
AE-26156/4	AMSU-A2 System, Comprehensive Performance Test and Limited Performance Test

STANDARD

STD-2454	Requirements for Electrostatic Discharge Control (Excluding Electrically Initiated Explosive Devices)

DRAWINGS

1331200	AMSU Assembly, A2
1331720	AMSU Assembly, A1

(Copies of Aerojet documents required by suppliers in connection with specific procurement functions should be obtained from Aerojet, CAGE 70143, P.O. Box 296, Azusa, California 91702-0296.)

2.2.2 ***Other documents.***

HP-125	Computer Controlled System Operator's Manual
HP-8566	Spectrum Analyzer Operating and Programming Manual
HP-85864A	EMI Measurement Software Operation Manual

3. REQUIREMENTS

3.1 *Test facility.* The test shall be conducted in a shielded enclosure with minimum dimensions of 10 feet long, 10 feet wide, and 10 feet high. The enclosure shall provide a minimum of 80 dB of attenuation to an electric field from 14 kHz to 10 GHz. The shielded test enclosure shall be serviced with 28, 10, and 5 volts DC filtered power as required.

3.1.1 *Test instrumentation.* The instrumentation for performance of the tests will consist of test equipment, accessories, and fixtures selected and configured for accuracy and effectiveness in accordance with the applicable requirements of MIL-STD-461 and MIL-STD-462, and the applicable test procedure. Calibration of the test instrumentation shall be current and in accordance with the applicable requirements of MIL-STD-461, MIL-STD-462, the applicable manufacturer's published data, and MIL-STD-45662. Specific instrumentation used shall be noted on the applicable test data sheets and in the final test report. Alternate instrumentation and procedures may be invoked when applicable. Specific instrumentation used for each of the EMI/EMC tests described herein shall be in accordance with Table A-I of Appendix A.

3.1.1.1 *Meter settings.* Whenever possible, the range setting of measuring equipment shall be such that the meter reading is in the section of the scale as follows:

a. Voltage and current reading: The upper one-third of the meter scale

b. Resistance readings: The one-third section of the scale closest to the 0-ohm mark

c. Field intensity readings: Mid-range of the meter scale.

3.1.1.2 *Multi-range settings.* Measurements that may be obtained on separate ranges on multi-range equipment shall be measured on each range to assure measurement continuity. Disparities in the resulting measurements of more than ±2 dB, if occurring, shall be resolved by adoption of the highest reading obtained, or by recalibration of the item of test equipment, applicable accessories, and test setup, as warranted.

3.1.1.3 *Measurement accuracies.* All measurements made in accordance with this procedure shall have the following accuracies, unless otherwise specified in a particular test:

a. Frequency accuracy: ±2 percent

b. Amplitude accuracy: ±2 dB.

3.1.2 *Limitations and restrictions.* The following limitations and restrictions apply to the test facility and test instrumentation used in the tests described herein:

a. Radiated emissions: If no EMI emissions above background noise levels are detected in the range of 400 MHz to 1 GHz during those tests, no measurements shall be made above 1 GHz. Otherwise, the full test range to 2 GHz shall be measured.

b. Conducted susceptibility levels: Injected susceptibility test voltages and spike transients shall be limited to the extent that resulting test currents do not exceed the fuse steady-state current limit or normal current rating for the test article. The latter condition is a credible limit for potential external EMI sources, and is adopted as a procedural safeguard against resonance failures in test article components at levels exceeding credible input power delivery capabilities. Under these conditions, the minimum power ripple requirements of IS-3267415 shall be met.

c. Shielded enclosure frequency range: The shielded enclosure may be limited in its use for radiated emissions measurements and radiated field susceptibility tests above 1 GHz due to unpredictable enclosure resonance occurrences, net leakage levels, and space for the installation of suitable anechoic (RF absorbing) materials. Accordingly, as a tradeoff in testing convenience versus the cost in time and materials to correct potential shielded enclosure reflections and resonances as may interfere with RE02 measurements or RS03 field generations, a clear area in one of the electronic laboratories may be utilized as an alternate test site where such clear area complies with applicable MIL-STD-461 and MIL-STD-462 requirements. Another alternative may include testing to be performed at an outside test facility.

WARNING

No radiated field susceptibility test procedure will be initiated, or test level applied, that will risk the exposure of personnel to field strengths in excess of 2 mW/cm^2.

d. Radiated susceptibility safety: To support this restriction, test personnel and operating-control equipment will be stationed outside the closed illumination test chamber, or in a separate shielded chamber.

3.1.3 ***Test setup***. The test article test instrumentation placement and dimensional relationships, with respect to facility and equipment geometries, shall be in accordance with the requirements specified in MIL-STD-461, MIL-STD-462, and the applicable specification sheet. Bonding jumpers, as required, shall be in accordance with MIL-B-5087 requirements.

3.2 ***Required procedures and operations.*** The test article shall be subjected to the examinations and tests specified in Paragraph 3.4 herein.

3.3 ***Test conditions.*** The following paragraphs shall apply to all tests performed under this document.

3.3.1 ***Standard ambient conditions.*** The tests shall be performed under temperature and pressure conditions defined in STD-2454.

3.3.2 ***Test tolerances.*** The tolerances allowed on test conditions are intended only to provide for the accuracy of such items as instrumentation and controls. Test conditions shall be as close as possible to the nominal or center values specified and in no instance shall they exceed the tolerances specified.

3.3.3 ***Read-out accuracy.*** Performance 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.

3.3.4 ***Operation and control of test article.*** The detailed operation and control of the test article, test fixtures, and supporting instrumentation applicable to each inspection specified herein are described in the applicable detail specification sheet.

3.3.5 *Control of facilities and equipment*

3.3.5.1 ***General instructions.*** Equipment, cables, apparatus, and personnel not actively engaged in, or otherwise essential to, the test being performed shall not be present in the shielded enclosure and associated test areas during the tests. All authorized equipment and support services necessary for the performance of the tests shall be available and operational during the tests. Nearby operating equipment found to exert a compromising influence on test performance, results, or monitoring abilities shall not be operating during affected portions of the test.

3.3.5.2 ***Test site and test equipment ambient levels.*** The ambient electromagnetic level during testing, inclusive of measuring equipment internal noise levels, measured with the test article turned off, shall be at least 6 dB below the applicable test specified limit. Where noncompliances are encountered, either the high ambient source may be traced and appropriately reduced and attenuated, or a technique based on the method of MIL-STD-462 may be used to separate and measure test article EMI emissions from high ambient levels.

3.3.5.3 ***Open area testing.*** Open area testing, as defined in MIL-STD-463, shall not be employed. However, the basic objective principles applicable to open area testing will be applied, to the extent possible, in any tests that are performed in laboratory areas outside the EMI test laboratory shielded enclosures.

3.3.5.4 *Test spectra*

3.3.5.4.1 *Specification limit and frequency criteria.* The test setup, including test article orientation and operation, shall be configured to accurately simulate the modes and conditions of highest emissions and lowest susceptibility thresholds, as applicable. This shall include considerations of test article operation at both the high and low extremes of the input operating voltage range. The entire specified frequency range for each applicable test shall be scanned. Attention shall be directed toward ensuring that measurements are made at the test article critical frequencies as identified in the applicable specification sheet. For susceptibility tests, swept and discrete frequency tests shall be applied in incremental steps up to either:

a. The susceptibility threshold, if any, or

b. 6 dB above the specified limit.

Apparent susceptibility thresholds shall be recorded, and then scanned more extensively, in order to determine the frequency band and peak envelope of the susceptibility thresholds. Susceptibility threshold determinations shall be made in accordance with the criteria given in the applicable specification sheet.

3.3.5.4.2 *EMI safety margins.* Following incorporation of all applicable data correction factors, electromagnetic interference safety margins (EMISM) shall be determined for both emission and susceptibility test results relative to the specified limits.

3.4 *Detailed procedures*

3.4.1 *Responsibility for inspection.* Test implementation and execution, approved changes, data recording, test limitations, test article performance, and related considerations in accordance with this specification, MIL-STD-461, MIL-STD-462, and the requirements of the applicable test article specification, shall be given to the government prior to the start of the EMI tests herein, so that a representative may be designated to witness the testing.

3.4.2 *Monitoring procedure 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 shall be verified as being within its current calibration period. Calibration or alignment, necessary for operation of the equipment within the requirements of this document, shall be performed when required.

3.4.3 *Pretest verifications and baseline performances*

3.4.3.1 *Test article functional validation*

3.4.3.1.1 *Pre-test functional validation.* The test article shall be turned on and operated in accordance with the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4. Compliance with the applicable criteria of these specifications shall be the basis for continuing the EMI/EMC tests. The data recorded during pre-test validation shall be used as part of the comparison baseline for subsequent evaluations of test article performance during the EMI tests.

3.4.3.1.2 *Test article ambient emissions profile.* Upon completion of the pre-test functional validation, the test article shall be operated in the mode specified in 3.4.4.3 or Appendix B. The steady-state EMI emissions shall be scanned using the spectrum analyzer. Significant and prominent amplitudes and frequencies shall be noted in the engineering log book for subsequent comparison with results obtained during the EMI tests that follow. This noted spectral data shall be referred to as the test article ambient EMI profile. Both conducted and radiated emissions profile measurements shall be made during the course of the EMI tests in accordance with the applicable test sequence and setups.

3.4.4 *Functional test.* The functional test will be run prior to the EMC test to ensure that the AMSU-A instrument is operating within specified limits. During EMC testing the AMSU-A instrument will have its diagnostic program running in a looping mode so that EMI-induced errors may be detected.

3.4.4.1 *Test setup.* The EMI compatibility test shall be conducted utilizing AMSU-A STE and AMSU-A/STE cables.

3.4.4.2 ***Test to be performed.*** The following tests will be performed on the indicated power lines or units (refer to Table A-III of Appendix A for further detailed explanation):

a. Conducted Emission (CE01/CE03)

+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return
+28V Safety Heater
+28V Safety Heater Return

b. Radiated Emission (RE02 and RE04 static H field)

AMSU-A1
AMSU-A2

c. Conducted Susceptibility (CS01 and CS02)

+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return

d. Conducted Susceptibility (CS06)

+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return

e. Radiated Susceptibility (RS03)

AMSU-A1 and AMSU-A2

3.4.4.2.1 ***Power line pin allocation.*** The power lines will be routed together in order to minimize the number of tests to be performed. Each wire will be connected to a feedthrough capacitor as indicated in Table II.

Table II. Power Lines Routing

From	To
+28V Feedthrough	AMSU A1 J1-1
Capacitor Main Bus	AMSU A2 J1-1
28V Feedthrough	AMSU A1 J1-3
Capacitor Main Bus Return	AMSU A2 J1-3
+28V Feedthrough	AMSU A1 J1-5
Capacitor Pulse Load	AMSU A2 J1-5
28V Feedthrough	AMSU A1 J1-7
Capacitor Pulse Load Return	AMSU A2 J1-7
+28V Feedthrough	AMSU A1 J1-9
Capacitor Analog Telemetry Bus	AMSU A2 J1-9
28V Feedthrough	AMSU A1 J1-10
Capacitor Analog Telemetry Bus Return	AMSU A2 J1-10
+10V Feedthrough	AMSU A1 J4-12
Capacitor Interface Bus	AMSU A2 J4-12
10V Feedthrough	AMSU A1 J4-13
Capacitor Interface Bus Return	AMSU A2 J4-13

3.4.4.3 ***Mode of operation.*** Unless otherwise specified in specific test, the AMSU-A will be tested in the IN ORBIT mode of operation. This is also known as the "Full Scan Mode."

3.4.4.4 ***Computer Controlled System (CCS) measurement system calibration.*** Set up and operate all required equipment in the Computer Controlled System (CCS) in accordance with the latest revision of the operator's manual. Use the mini-floppy disks containing HP Basic 2.0, Version 3.1, of the 9836.461 system disk, and the project program disk which contains the preliminary program test routines. Verify that the CCS Operating System is the proper one to be used with the particular receiver. Install the system disk in the HP 9836 right-hand drive, and the Basic 2.0 disk in the left-hand drive.

3.4.4.4.1 ***Spectrum analyzer.*** If the HP 8566 spectrum analyzer or equivalent is used for measuring the conducted or radiated emissions, the system calibration shall be conducted in accordance with the HP Operating and Programming Manual and the HP 85864A EMI Measurement Software Operation Manual.

3.4.4.5 ***Susceptibility monitors.*** The monitors shown in Table III will be observed/recorded during the performance and susceptibility testing.

Table III. Monitors for Susceptibility Test

Susceptibility	Line/Item	Monitor
Conducted	28V Main Power, Main Load Bus	Data output all channels
CS01, CS02, and CS06	28V Pulse Load Bus	Antenna Position
Radiated RS01 and RS03	AMSU-A Enclosure	Data output all channels

3.4.4.6 ***Pass/fail criteria.*** The pass/fail criteria for the conducted and radiated emissions test shall be determined by inspection of the recorded emissions levels when compared to the specification limits. All emissions shall be on or below the specification limits. When narrowband emissions exceed the broadband limits or transient spikes exceed the narrowband or broadband limits, the specific emission shall be identified and exempted from these criteria. The identification of broadband and narrowband emission shall be in accordance with the test methods of paragraph 4.2.6 in MIL-STD-462.

Extensive EMI testing has been conducted at both the component level and the AMSU-A sensor system level. These tests have resulted in the incorporation of hardware corrective measures and established a thorough understanding of EMI susceptibility concerns for AMSU-A system performance. The primary concern is associated with collection of radiometric data.

An STE EMI data collection program has been developed and is included in the bonded test software of the STE. Operation of the system and the EMI data collection program will be coordinated with operation of the EMI susceptibility signal sweeps.

The EMI data collected will provide about a five scan period at the beginning and end of each data collection period which will allow comparison of each channel's normal radiometric response with and without the interference present. The data will be presented in the form of noise distribution plots for each of the radiometric channels and as a summary report for all channels. These data shall be reviewed as follows:

a. Review the summary data and identify channels with alarm counts greater than ten or channels that have sigma values that are a factor of two greater than observed in baseline checks made periodically during the test.

b. Examine the noise distribution plots for channels identified in the above paragraph, and look for disruptions during the period when the EMI signal sweep was made. If an EMI disruption results in a peak-to-peak increase in channel noise which is less than twice the normal level or, if the disruption creates a level shift in the noise data which is equal to or less than the normal noise level, then it is acceptable (pass).

c. Examine all remaining plots for disruptions, identify, and file the data.

d. If any channel fails, additional sweeps will be made over a reduced frequency range and at reduced amplitudes as necessary to determine the threshold of the susceptibility.

The test will continue to establish an overall assessment of the behavior. The EQUIPMENT LIMIT (EL) column will be checked when the test equipment cannot deliver the required level. Since the test equipment meets the power requirements of MIL-STD-461 and the AMSU-A instrument is not susceptible to the output of the signal source, a check on this column indicates the unit passed the test requirement. A check in the SPECIFICATION LIMIT (SL) column indicates the AMSU-A instrument met the requirements.

3.4.5 ***CE01/CE03 test.*** This test shall measure the conducted emissions on power lines from 30 kHz to 50 MHz by measuring the current levels present in the power lines of paragraph 3.4.4.2.a or Table A-III of Appendix A, as applicable. The METOP conducted emissions will be performed in the differential and common mode.

3.4.5.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Computer Control System Spectrum Analyzer, HP 8566B, HP 3562B

b. Amplifier, HP 461A, HP 8447F

c. Feedthrough Capacitors, Solar 6512-106R. METOP will use LISN's as shown in Figure 1.

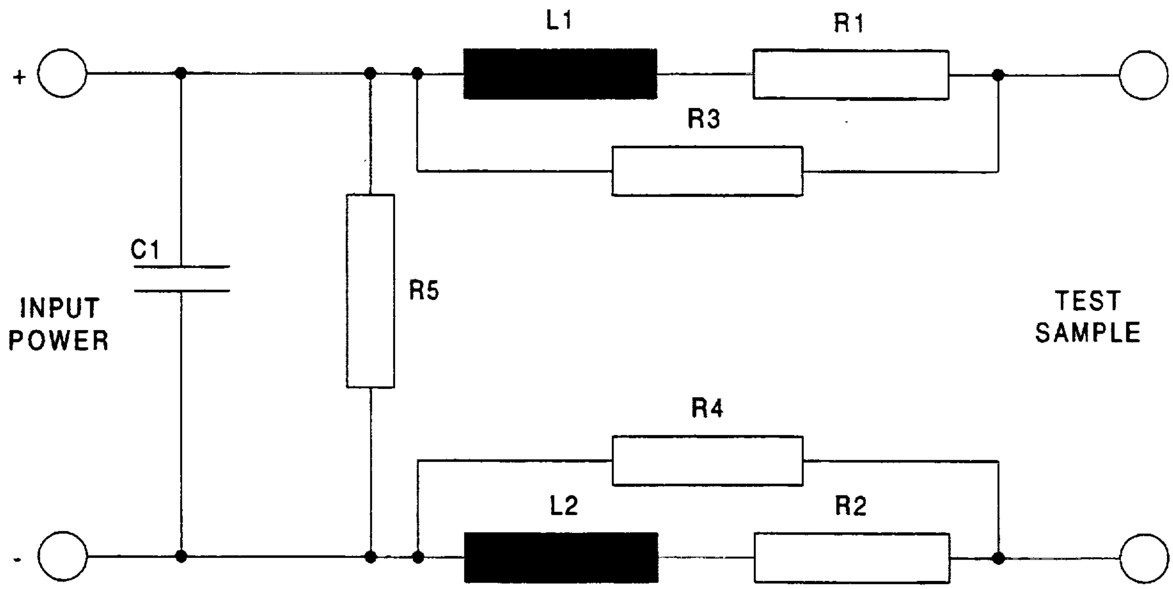
d. Computer, HP 9836

e. Current Probe, AIL Tech 91550-2B

f. Printer, HP 2673A

g. Plotter, HP 7090A

h. Filter Box, Aerojet, T-1289992-1



R1, R2 = 20 mOhm ± 5 mOhm
R3, R4 = 25 Ohm ± 5 %
R5 = 50 kOhm ± 5%
C1 = 19000 µF ± 5%
L1, L2 = 2 µH ± 5%

Figure 1. LISN Circuit Diagram

3.4.5.2 ***Test limits***

3.4.5.2.1 ***Imposed limits.*** The level of conducted emissions permitted from 10 kHz to 50 MHz shall meet the requirements of IS-3267415. The limits are shown in Figure 2. The METOP shall meet the conducted emission limits from 30 Hz to 50 MHz as shown in Figures 3 and 4. The limits provided in Figures 3 and 4 are for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.5.2.2 ***Corrected limits***. The imposed limits shall be adjusted by correcting for the appropriate probe factor.

3.4.5.3 ***Test procedure***

3.4.5.3.1 ***Preparation***

1. Connect the equipment under test as shown in Figure 5a and the power lines as indicated in 3.4.4.2.a or Table A-III of Appendix A, as applicable. Fill in data on equipment actually used in Equipment Log on Test Data Sheet (TDS) 1 in Appendix B.

2. Connect the AMSU and support equipment for a functional check.

3. Perform the functional test per the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4, paragraph 3.2.3.5.

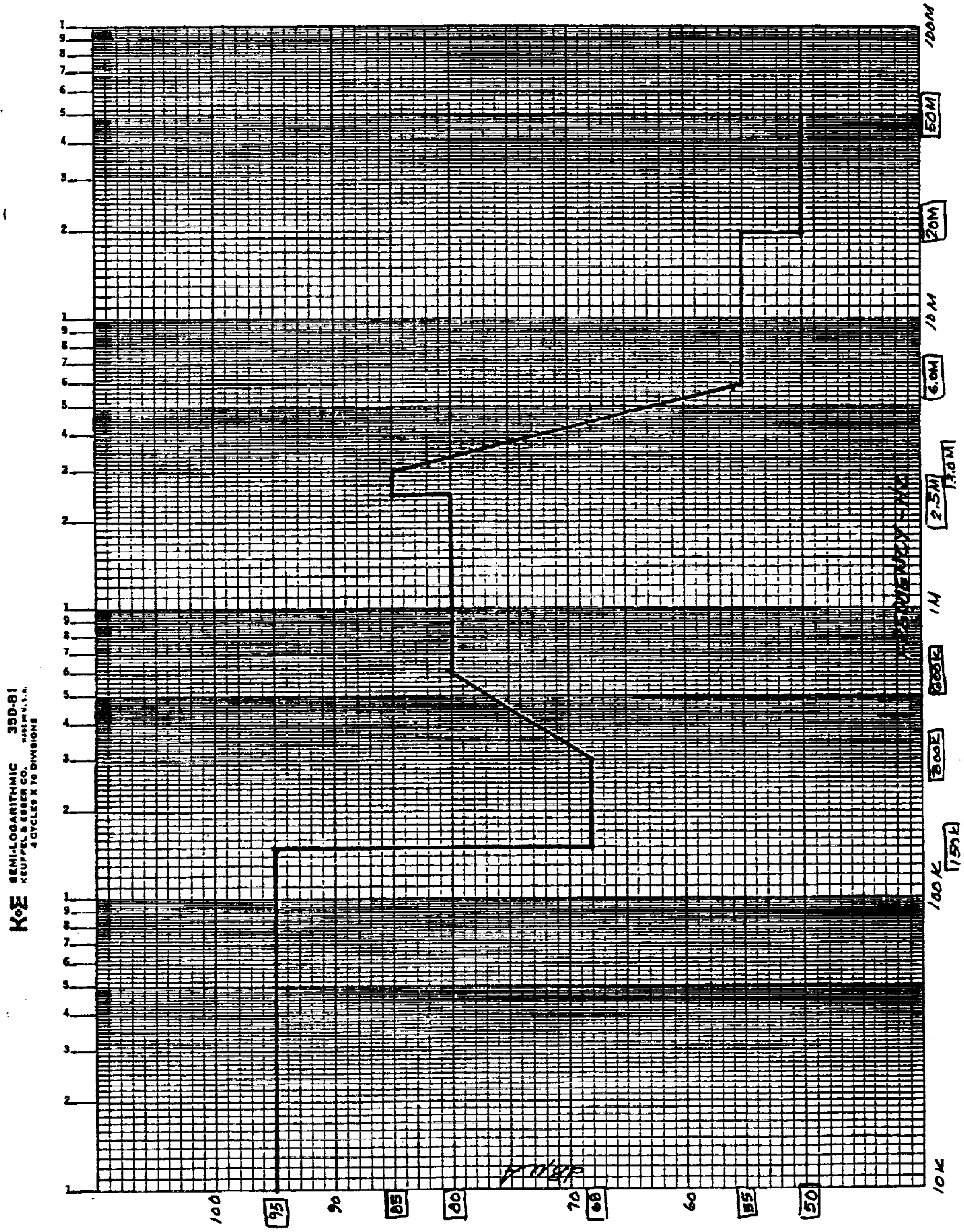


Figure 2. Narrowband Conducted Emissions Limits on Power Leads

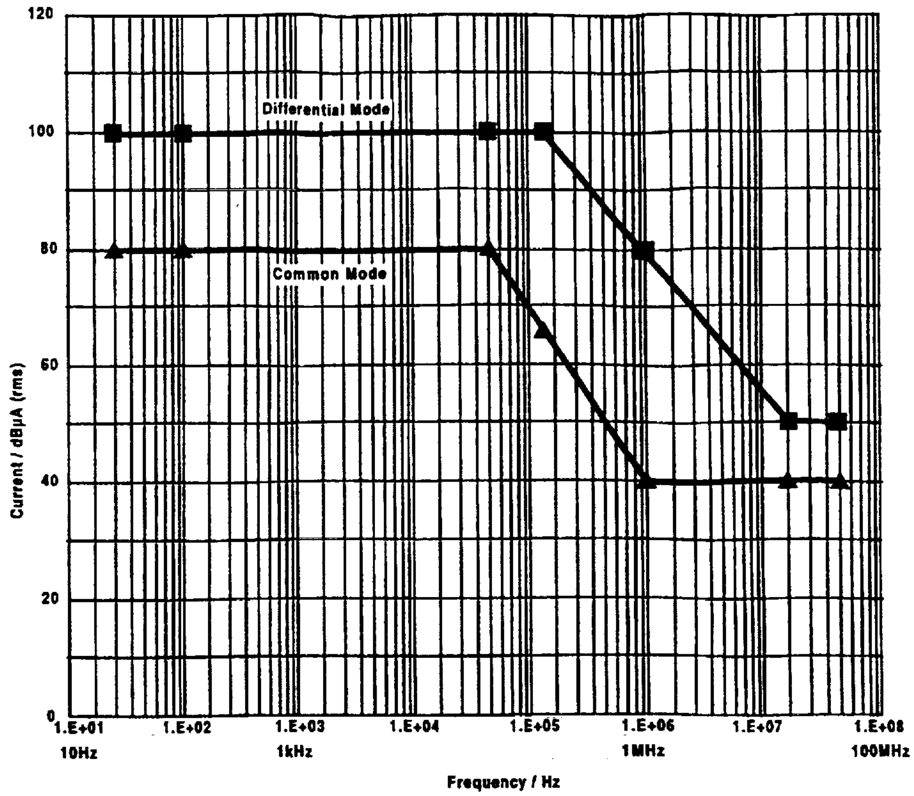


Figure 3. Conducted Emission Limit, NB, DM, CM, 28V Reg. Power Leads, PLM Instrument

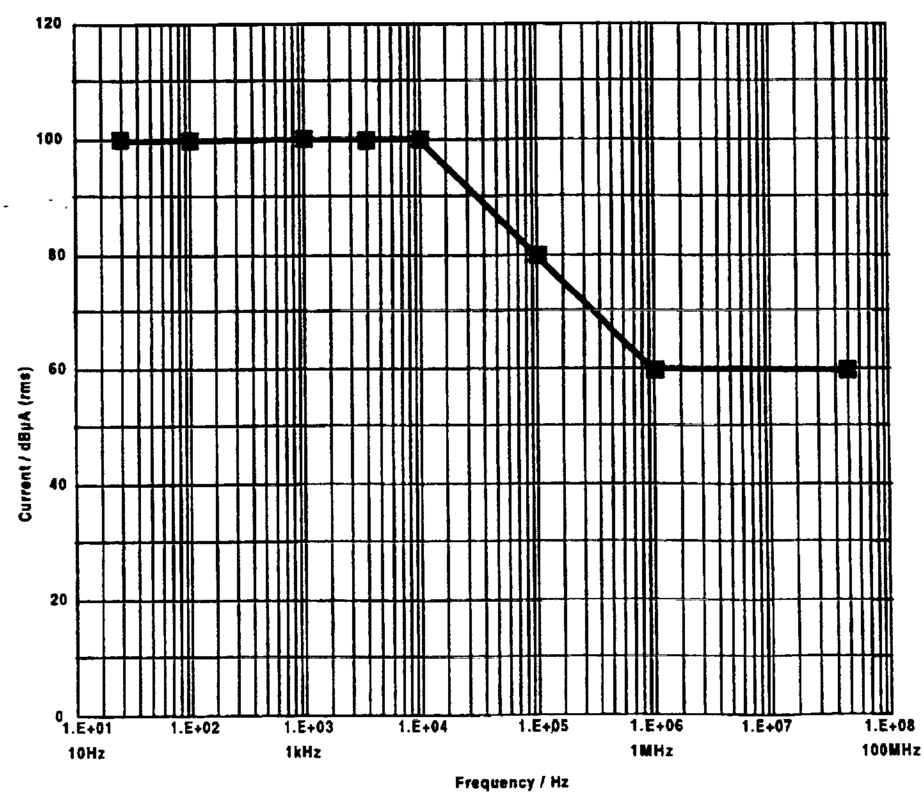
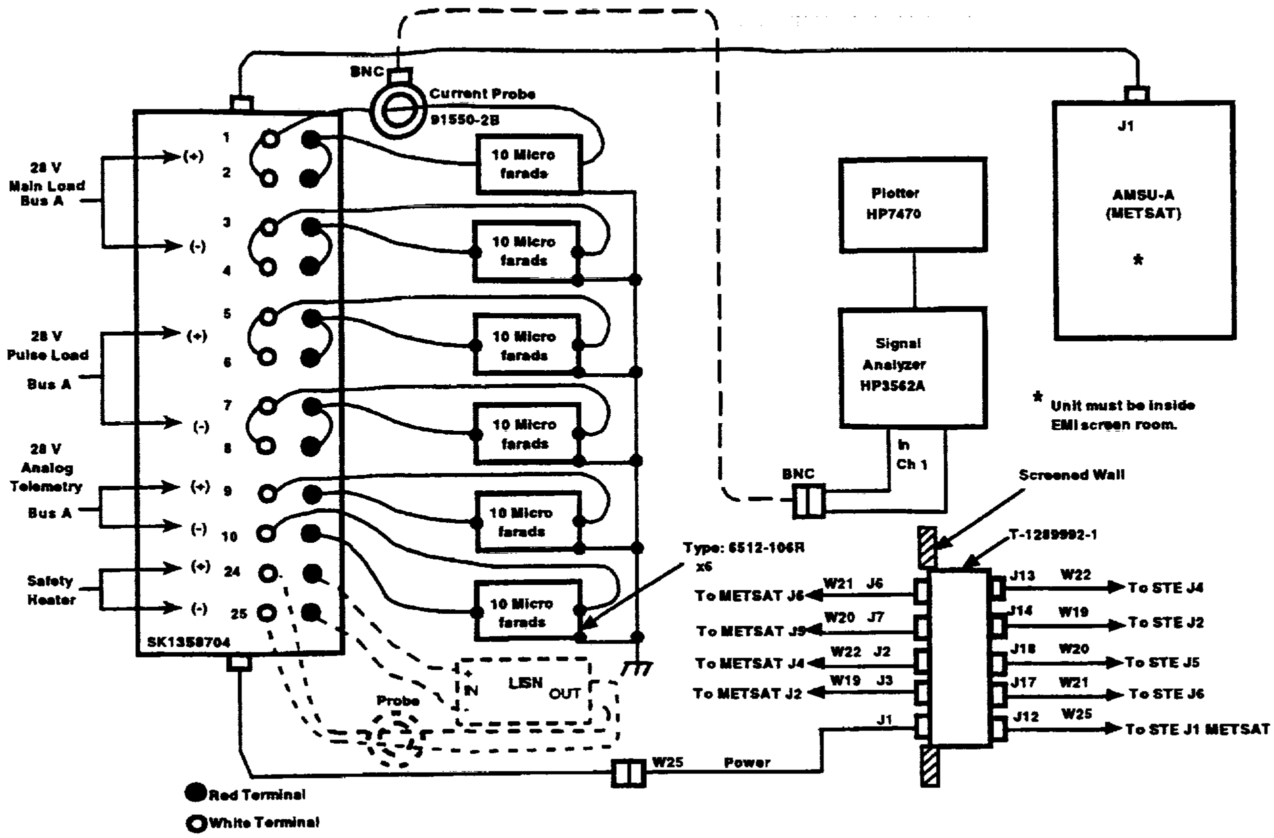


Figure 4. Conducted Emission Limit, NB, DM, Thermal Control Heaters (Safety Heater)



1. Feedthrough capacitor.
2. Bond to ground plane
3. Test sample situated in test fixture, 10 cm from front edge of ground plane.
4. Bond to test fixture as defined.
5. Filtered power supply terminals at screened enclosure wall.
6. Test sample interconnecting lead. Length as defined in the installation specification.
7. Power leads emulating the spacecraft configuration.
8. Interconnecting lead to monitoring equipment/test set via port-hole.
9. Test fixture DC bond to screened enclosure wall or ground plane shall be less than 2.5 milliohms.
10. Current probe connected to receiver via coaxial cable.

Figure 5a. CE01/CE03 Test Setup (Differential Mode)

4. Calibrate the receiving test equipment.

5. Before starting test, place the AMSU-A instrument in the IN ORBIT mode.

3.4.5.3.2 ***Emission measurement, 30 Hz to 20 kHz (CM & DM) - CE01***

1. Place the 91550-1 current probe on one of the power lines listed in 3.4.4.2a or Table A-III of Appendix A, as applicable.

2. Verify that the measuring equipment is programmed to measure between 30Hz and 20 kHz. If necessary, program the signal analyzer for multi-scan and compare the measurement to the signal scan. Capture the highest level possible in each range.

3. Using the spectrum analyzer, automatically scan all narrowband data in the frequency range.

4. Photograph the cathode ray tube (CRT) presentation or make an X-Y plot. All narrowband measured data should be below the specification limit of Figures 2, 3, and 4. Record compliance with emission limits requirements on TDS 1. Set the computer to print the measured level of the signals above 30 dB above 1μV for reference.

5. Confirm all over limit levels by direct substitution. If any emissions exceed or near the limit, scan the frequency range that exhibits the over-the-limit levels, reduce the frequency span, reduce the measuring bandwidth to 5 or 500 Hz, and photograph the CRT presentation or make an X-Y plot.

6. Affix the test photos and calculations to TDS 1.

7. Repeat Steps 1 through 6 for all the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

8. If any narrowband signals exceed the limits, perform an ambient test.

9. With the STE Main Power off, turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until the knob stops turning.

10. Connect the equipment as shown in Figure 5b. Place switches 1 through 10 and 14 through 25 in the OPEN position.

11. Turn the STE Main Power switch to ON, and turn the Q/Main and N/Pulse switches (green switches) on the STE Main Front Panel, to ON.

12. Gradually increase the Q/Bus voltage on the STE Power Supply to the 28 V level as monitored by the DVM (see Figure 5b).

13. Repeat steps 1 through 6 and 8 of this section.

14. Command the instrument power to OFF. Turn off the Main Power switch on the STE, and turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until it stops turning.

15. Place the current probe and the LISN on the next power line indicated in 3.4.4.2a, or Table A-III of Appendix A, or both. Repeat steps 11 and 12.

16. Repeat steps 13 through 15 until the test is completed.

17. Change the setup configuration as depicted in Figure 5c. Place switches 12, 13, 24, and 25 to the OPEN position.

18. Connect the current probe on the +10 V Interface Line, as shown in Figure 5c.

19. Repeat steps 2 through 6 and step 8 of paragraph 3.4.5.3.2.

20. Move the current probe to the line of Terminal 13 (white terminal).

21. Repeat step 19.

22. Connect the current probe as depicted in Figure 5d.

23. Repeat step 19.

3.4.5.3.3 *Emission measurement, 20 kHz to 50 MHz (CM & DM) - CE03*

1. Connect the equipment as shown in Figure 5a. Apply power to the test equipment and special test equipment (STE) and place the instrument in full scan mode. Place the 91550-1 current probe on one of the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

2. Verify that the measuring equipment is programmed to measure between 30 Hz to 20 kHz or 20 kHz to 50 MHz, or both.

3. Using the spectrum analyzer, automatically scan all narrowband data in the frequency range. Print the CRT presentation.

4. Photograph the cathode ray tube (CRT) presentation or make an X-Y plot. All narrowband measured data should be below the specification limit of Figures 2, 3, and 4. Record compliance with emission limits requirements on TDS 1. Set the computer to print the measured level of the signals above 30 dB above 1μV for reference.

5. Confirm all over limit levels by direct substitution. If any emissions exceed or near the limit, scan the frequency range that exhibits the over-the-limit levels, reduce the frequency span, reduce the measuring bandwidth to 5 or 500 Hz, and photograph the CRT presentation or make an X-Y plot.

6. Affix the test photos and calculations to TDS 1.

7. Repeat Steps 1 through 6 for all the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

8. If any narrowband signal exceeds the limits, perform an ambient test.

9. With the STE Main Power off, turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until the knob stops turning.

10. Connect the equipment as shown in Figure 5b. Place switches 1 through 10 and 14 through 25 in the OPEN position.

11. Turn the STE Main Power switch to ON, and turn the Q/Main and N/Pulse switches (green switches) on the STE Main Front Panel to ON.

12. Gradually increase the Q/Bus voltage on the STE Power Supply to the 28 V level as monitored by the DVM (see Figure 5b).

13. Repeat steps 1 through 6 and 8 of this section.

14. Command the instrument power to OFF. Turn off the Main Power switch on the STE, and turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until it stops turning.

15. Place the current probe and the LISN on the next power line indicated in 3.4.4.2a, or Table A-III of Appendix A, or both. Repeat steps 11 and 12.

16. Repeat steps 13 through 15 until the test is completed.

17. Change the setup configuration as depicted in Figure 5c. Place switches 12, 13, 24, and 25 to the OPEN position.

18. Connect the current probe on the +10 V Interface Line, as shown in Figure 5c.

19. Repeat steps 2 through 6 and step 8 of paragraph 3.4.5.3.3.

20. Move the current probe to the line of Terminal 13 (white terminal).

21. Repeat step 19.

22. Connect the current probe as depicted in Figure 5d.

23. Repeat step 19.

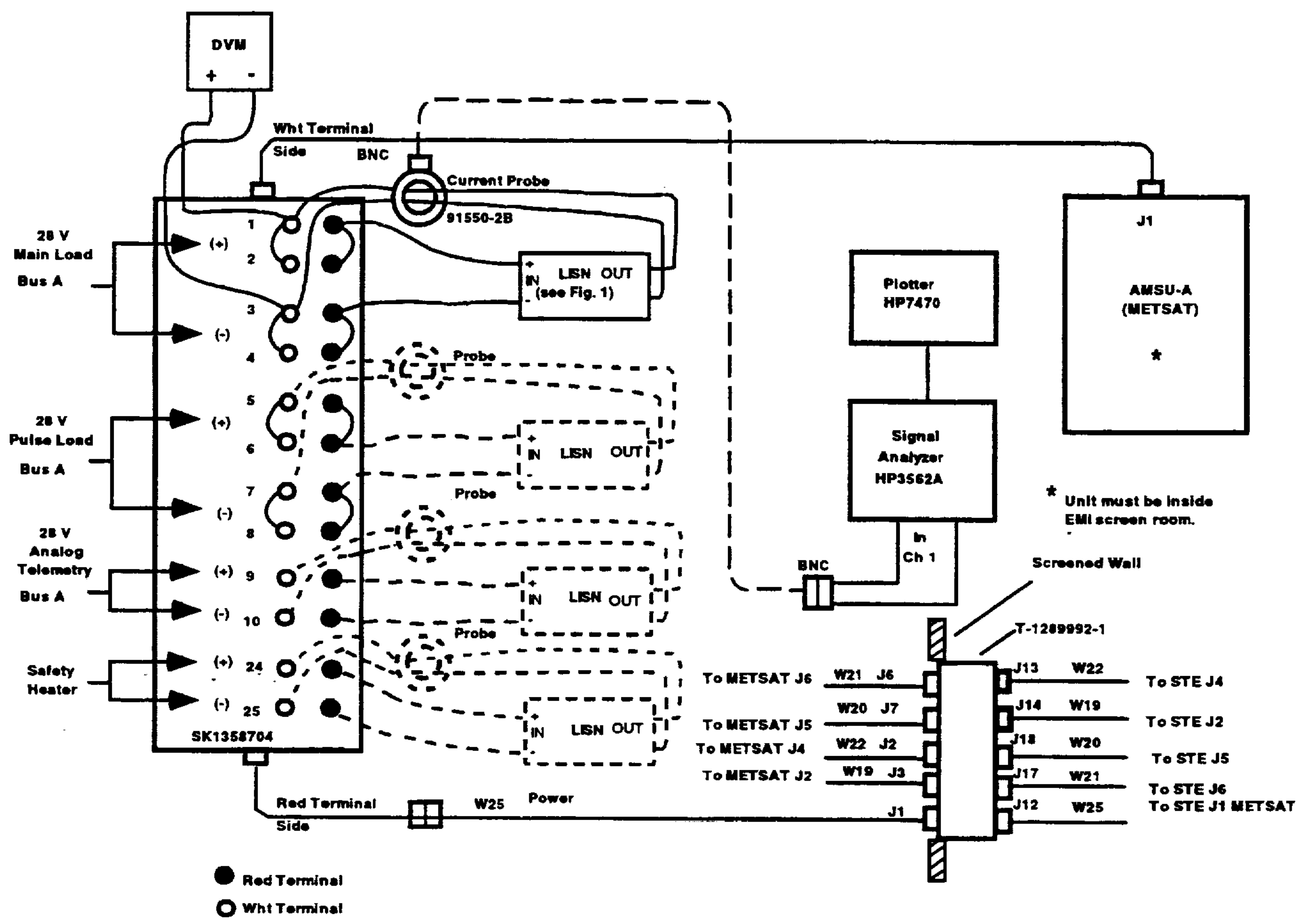


Figure 5b. CE01/CE03 Test Setup (Common Mode)

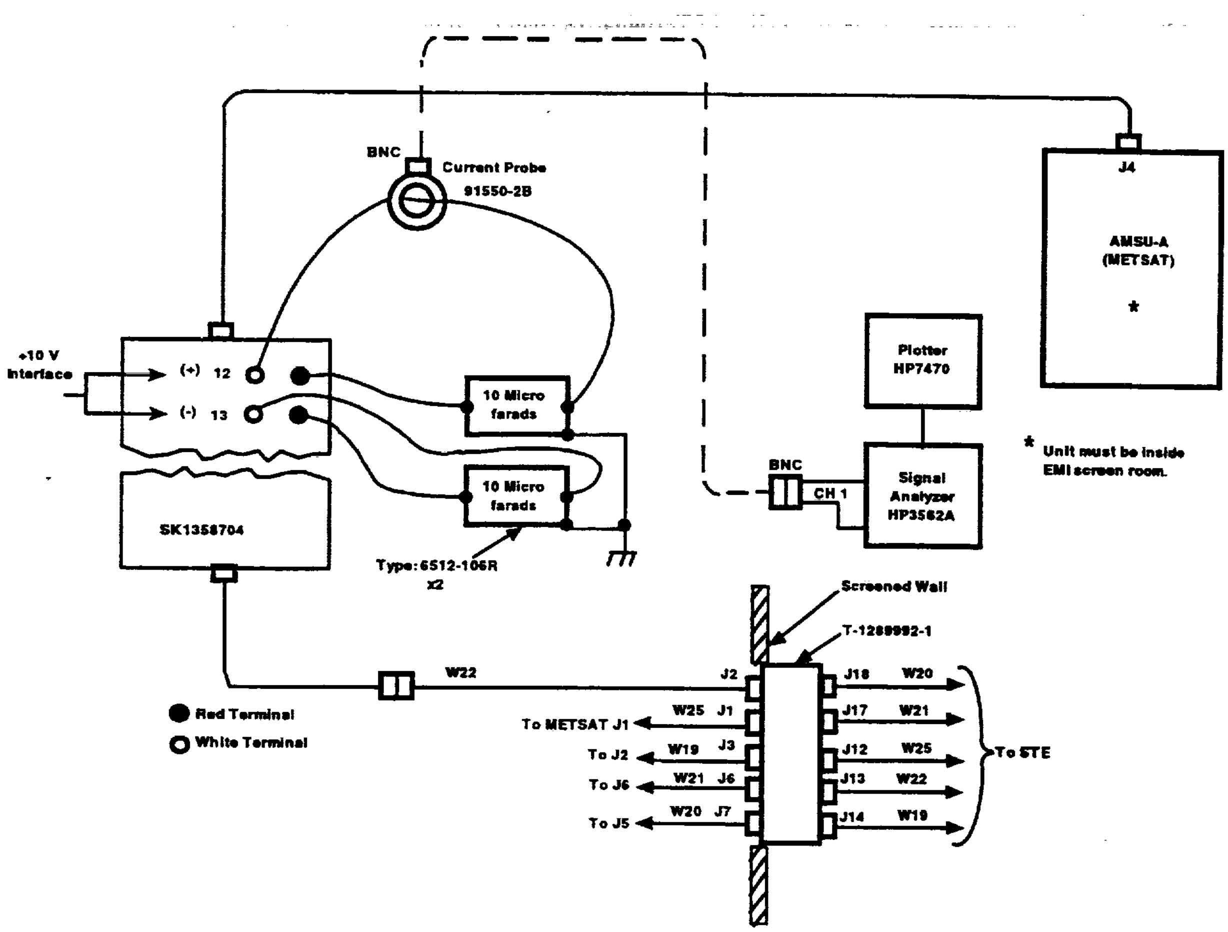


Figure 5c. CE01/CE03 +10 V Interface Test Setup (Differential Mode)

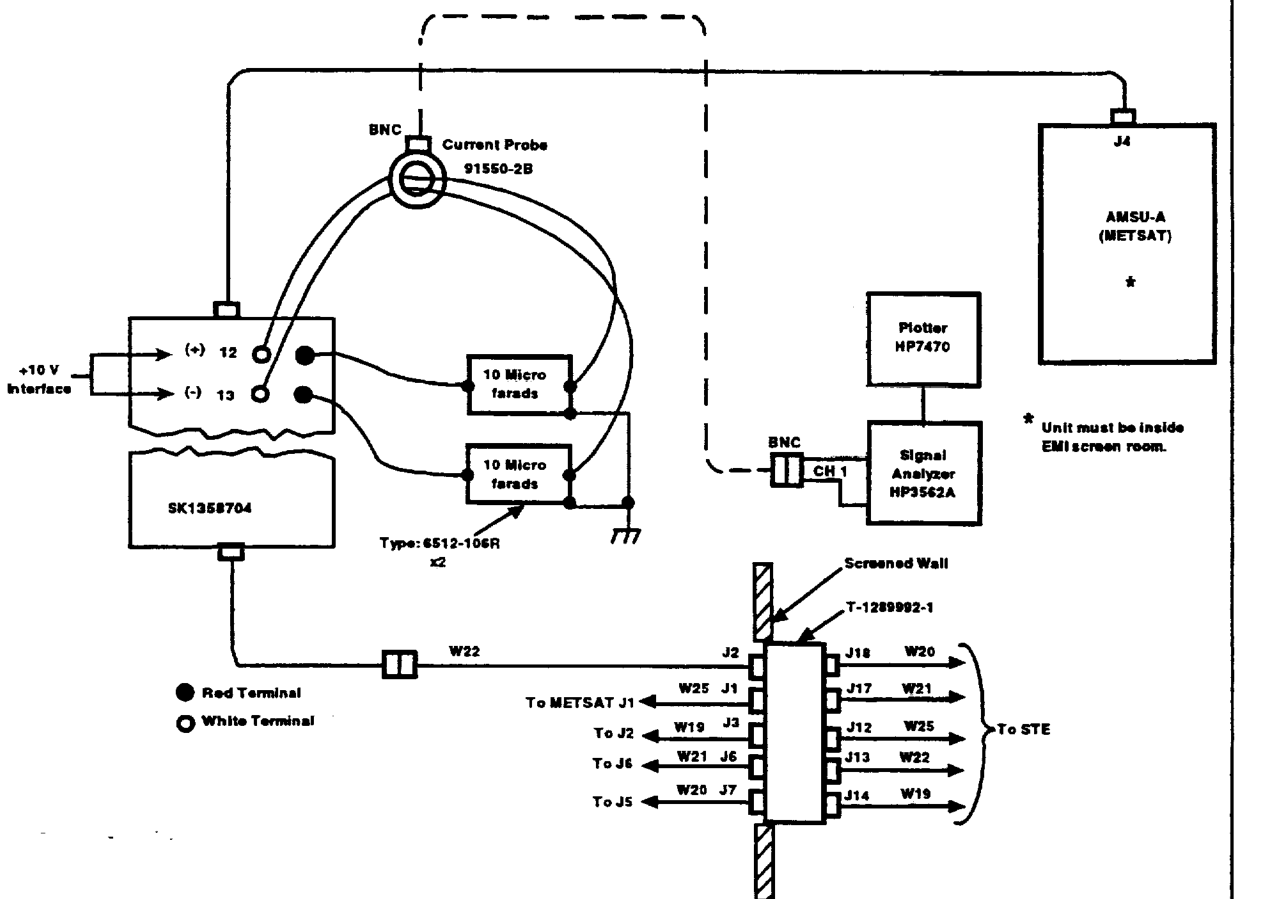


Figure 5d. CE01/CE03 +10 V Interface Test Setup (Common Mode)

3.4.6 ***RE02 test.*** This test shall measure the electric fields radiated from the AMSU equipment(s) over the frequency range of 14 kHz to 2 GHz to verify that the emissions are below the RE02 limit specified in MIL-STD-461C. In addition, the equipment will be tested for the emission of the following frequencies to verify either that the frequencies are not present or that their signal level does not exceed the test equipment sensitivity level listed for each frequency.

Frequency	Receiver/Ampl Sensitivity
59.458 MHz ±0.5 kHz	–60 dBm
60.10 MHz ±0.5 kHz	–60 dBm
141.360 MHz ±0.5 kHz	–60 dBm
142.9 MHz ±0.5 kHz	–60 dBm
282.733 MHz ±0.5 kHz	–60 dBm
285.813 MHz ±0.5 kHz	–60 dBm
371.921 MHz ±0.5 kHz	–60 dBm
375.972 MHz ±0.5 kHz	–60 dBm
624.925 MHz ±0.5 kHz	–60 dBm
631.730 MHz ±0.5 kHz	–60 dBm
743.841 MHz ±0.5 kHz	–60 dBm
751.944 MHz ±0.5 kHz	–60 dBm
121.5 MHz ±15 kHz *	–150 dBm (Bandwidth 100 Hz)
243 MHz ±25 kHz *	–150 dBm (Bandwidth 100 Hz)
401.650 MHz±50 kHz *	–150 dBm (Bandwidth 100 Hz)
406.05 MHz±50 kHz *	–150 dBm (Bandwidth 100 Hz)
2010-2040 MHz	–120 dBm

* METOP replaces these frequencies with the frequencies in Table IV.

3.4.6.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Computer Controller System, Spectrum Analyzer, HP 8566, or equivalent

b. Amplifier, HP 8447F, or equivalent

c. Feedthrough Capacitors, Solar 6512-106R

d. Antenna, Active Rod, EMCO 3301B with Counterpoise, 14 kHz to 30 MHz

e. Antenna, Biconical, Electro-Metrics BIA25, 20 to 200 MHz

f. Antenna, Log Spiral, Electro-Metrics LCA25, 200 MHz to 1 GHz

Table IV. SARR, SARP, and DCS Receiver Channel Guard Limits

Frequency Range (MHz)	Radiation Limit (dBm)	E-Field Limit * (dB μV/m)	Notes
118.00-120.00	-100	18.9	121.5 MHz
120.00-121.450	-125	-6	121.5 MHz
121.450-121.485	-145	-26	121.5 MHz
121.485-121.515	-150	-31	121.5 MHz
121.515-121.550	-145	-26	121.5 MHz
121.550-123.000	-125	-5.9	121.5 MHz
123.000-125.000	-100	19.2	121.5 MHz
236.000-240.000	-100	24.9	243.0 MHz
240.000-242.925	-125	0	243.0 MHz
242.925-242.975	-145	-20	243.0 MHz
242.975-243.025	-150	-25	243.0 MHz
243.025-243.075	-145	-20	243.0 MHz
243.075-246.000	-125	0.1	243.0 MHz
246.000-250.000	-100	25.3	243.0 MHz
385.100-401.100	-100	29.4	406.05 MHz
401.100-405.900	-125	4.5	406.05 MHz
405.900-406.000	-145	-15.5	406.05 MHz
406.000-406.100	-150	-20.5	406.05 MHz
406.100-406.200	-145	-15.5	406.05 MHz
406.200-411.000	-125	4.6	406.05 MHz
411.000-425.000	-100	29.9	406.05 MHz
396.000-401.500	-125	4.4	401.65 MHz
401.500-401.600	-145	-15.6	401.65 MHz
401.600-401.700	-150	-20.6	401.65 MHz
401.700-401.800	-145	-15.6	401.65 MHz
401.800-406.000	-125	4.5	401.65 MHz

* E-field limits have been calculated by METOP and are for reference only. The following formula has been applied for translating Power levels to Field strength levels.

$$E[dB\mu V/m] = P[dBm] - Gr[dBi] + 20log(\mathrm{f[Hz]}) - 42.7$$

where P is the received power, Gr is the gain of the receiving antenna and f is the frequency. Note that Gr has arbitrarily been set to 0 dB (isotropic) in calculating the above levels. E-field limits would have to be adjusted to reflect actual test antenna characteristics.

g. Antenna, Double-Ridged Guide Antenna, Electro-Metrics RG180, 1-18 GHz

h. Signal Analyzer, HP 71210C with HP 70620 Series Preamplifier

i. Amplifier, HP 461A, or equivalent

j. Computer, HP 9836

k. Printer, HP 2673A

l. Plotter, HP 7090A

m. Filter box, Aerojet, T-1289992-1.

3.4.6.2 *Limits*

3.4.6.2.1 ***Allowable limits.*** The limits of the emissions shall conform to the requirements of MIL-STD-461C. The limits are shown in Figures 6 and 7 Measurements shall be made over the frequency range from 20 kHz to 1 GHz for broadband emissions and from 14 kHz to 2 GHz for narrowband emissions. The appropriate antenna and other pertinent factors are automatically included in the computer EMI test routines. The METOP instrument shall meet the electric field radiated emissions as shown in Figure 8. The limits provided in Figure 8 are for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.6.3 ***Test procedure***

3.4.6.3.1 ***Preparations***

1. Connect the test equipment as shown in Figure 9 with the antenna in front of either of the two units (A1 or A2), one meter away at the point of maximum interference. Fill in Equipment Log on TDS 2.

NOTE

In order to reduce ambient emissions or obtain a profile of the electric-field ambient emission spectrum, or both, and at the discretion of the test engineer, the test set can be positioned inside the test enclosure. The interconnecting cables shall be shielded or placed inside a shielded box to reduce cable length and radiations.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3.4.6.3.2 ***Test steps***

1. Connect the antenna to the appropriate amplifier to the receiver equipment. Verify that the AMSU interface cables used for monitoring are shielded.

2. Perform the system calibration of the HP8566 spectrum analyzer.

3. Using the HP8566, automatically scan all narrowband data from 14 kHz to 1 GHz, switching the appropriate antenna and amplifier throughout the frequency range. Set the computer to print the CRT presentation with limits.

4. All data should be below the specification limit of Figure 6. Record compliance with emission limit requirements on TDS 2. If any emissions are observed to exceed the limit line, set the computer to print the measured levels.

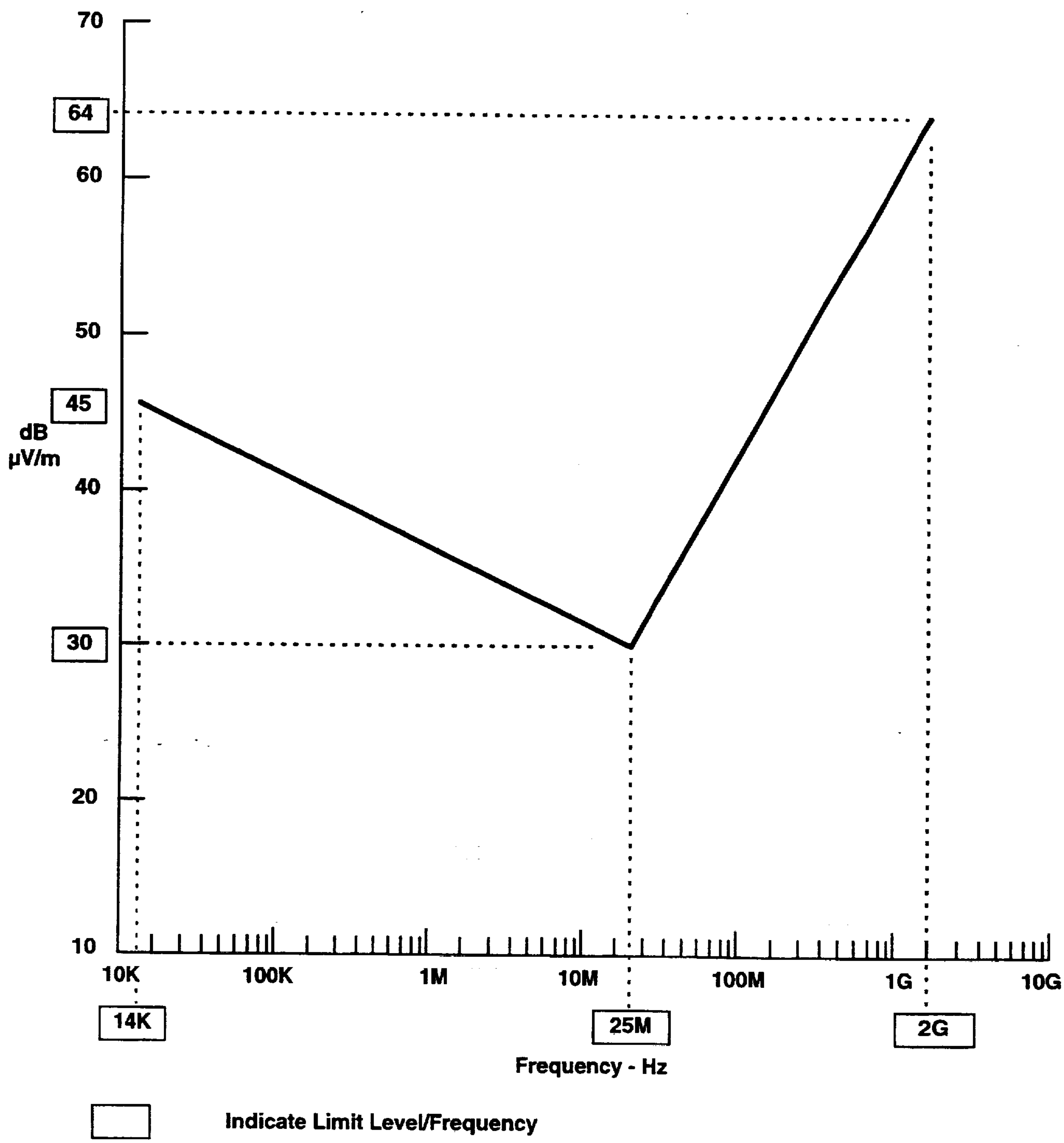


Figure 6. Radiated Narrowband Limits for Electric-Field Emission Produced by Instrument

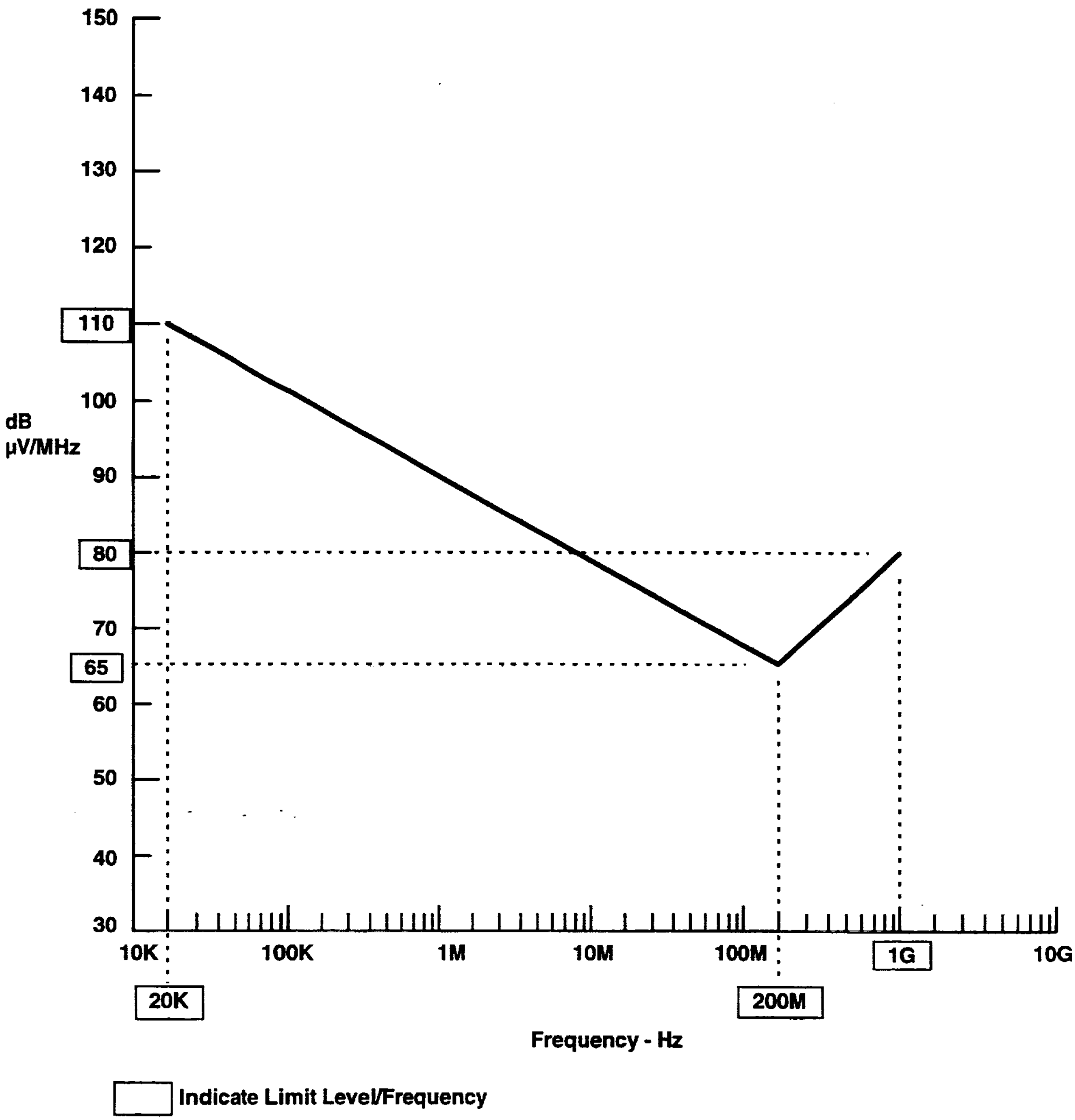
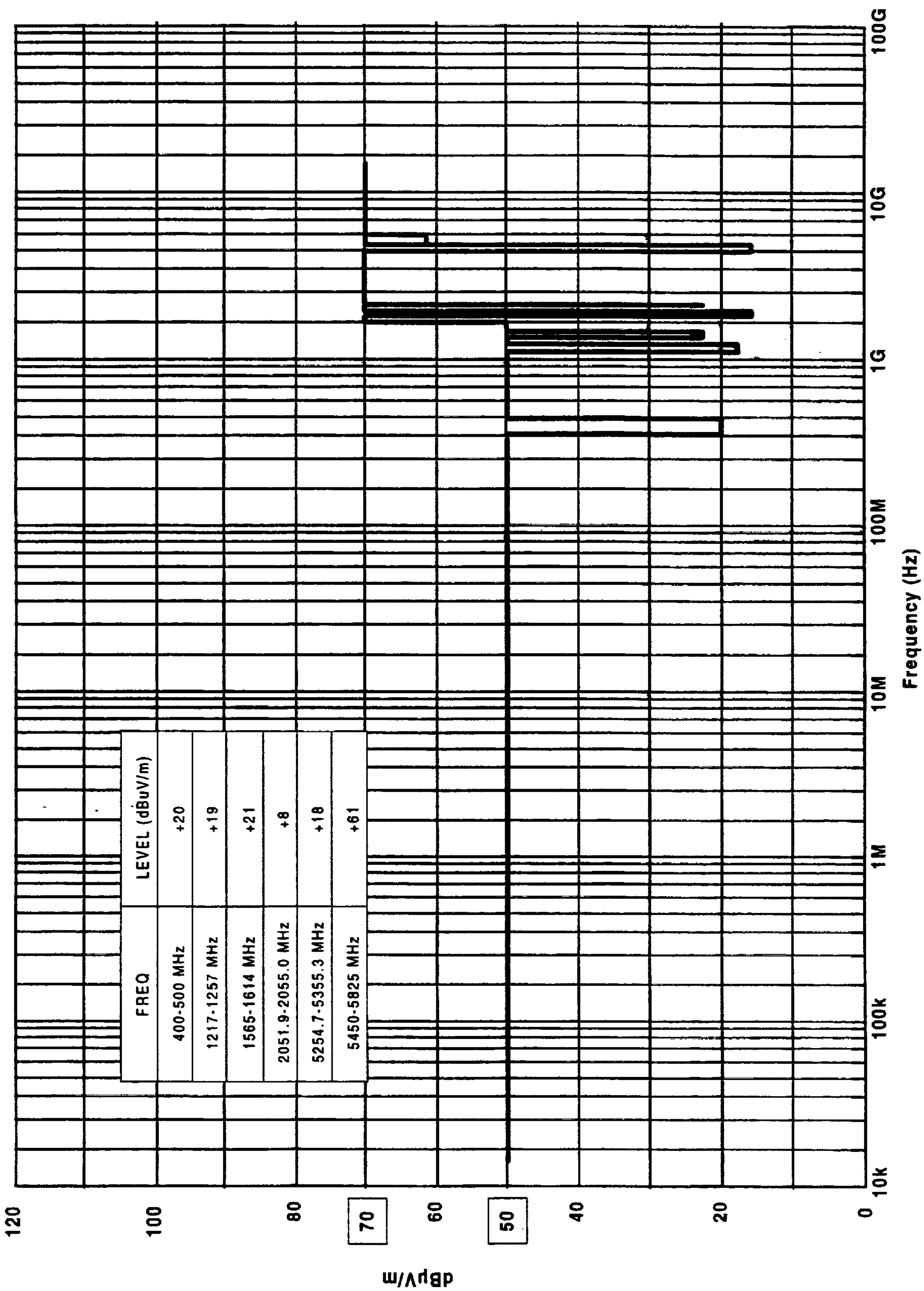
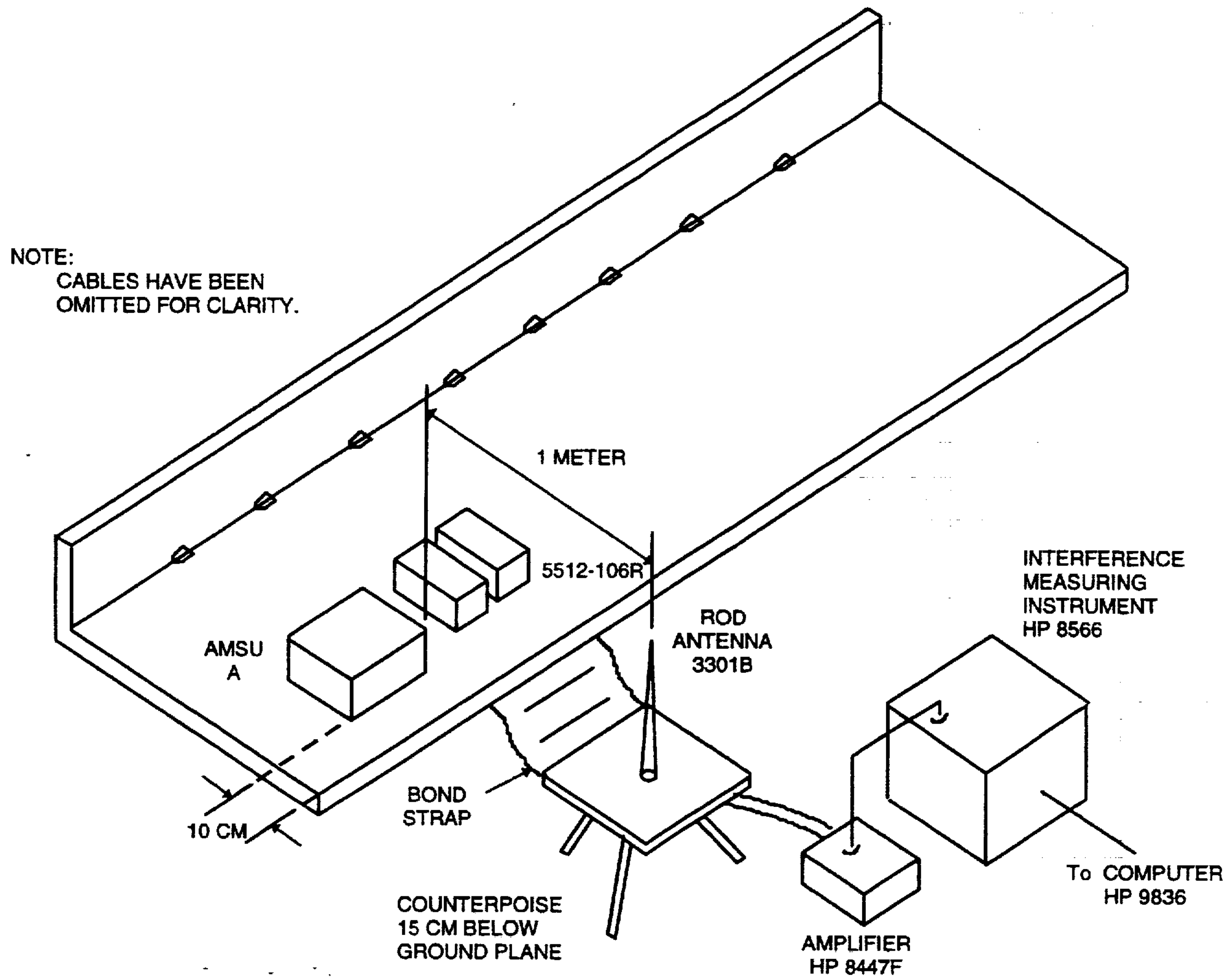


Figure 7. Radiated Broadband Limits for Electric-Field Emissions Produced by Instrument



FREQ	LEVEL (dBuV/m)
400-500 MHz	+20
1217-1257 MHz	+19
1565-1614 MHz	+21
2051.9-2055.0 MHz	+8
5254.7-5355.3 MHz	+18
5450-5825 MHz	+61

Figure 8. Radiated Narrowband Limits for Electric Field Emissions METOP Only



14 kHz to 10 GHz Antennas

Manufacturer	Model	Frequency Range
EMCO	3301B Rod	14 KHz - 30 MHz
Electro-Metrics	BIA-25 Biconical	20 MHz - 200 MHz
Electro-Metrics	LCA-25 Log Conical	200 MHz - 1 GHz
Electro-Metrics	RG-180 Horn	1 GHz - 18 GHz

Figure 9. RE02 Test Setup

5. Request all broadband data from 14 kHz to 1GHz from the computer. Plot the CRT presentation with limits.

6. All data should be below the specification limit of Figure 7. Record compliance with emission limit requirements on TDS 2. If any emissions are observed to exceed the limit line, set the computer to print the measured levels and perform ambient radiated emission tests to determine the source of the radiated emission as indicated in Step 7.

7. Turn off power to the AMSU-A power supplies. Perform a frequency scan throughout the frequency range that exceeded the limits. Turn off power to the computer, display, and printer and repeat the frequency scan through the previously tested frequency range. Print all measured ambient levels.

8. Frequencies detected to be generated from the test set components or generated by outside sources, or both, will be compared with emissions radiating from the AMSU-A equipment. Ambient frequencies will be deleted from the radiated emission of the AMSU-A equipment, as being generated outside the unit under test. The remaining frequencies should be below the specification limits.

9. Set up the double-ridged guide horn antenna one meter from the point of maximum radiation.

10. Calibrate the spectrum analyzer, HP8566.

11. Sweep throughout the frequency range of 1 GHz to 2 GHz recording the observed narrowband emission levels.

12. All data should be below the specification limit of Figure 6. Record compliance on TDS 2.

13. Repeat Steps 3 through 12 with the instrument isolated from the ground plane.

14. Activate the HP 70620 with the series amplifier. Program the analyzer for noise averaging to a minimum of eight times. Verify that the sensitivity noise level is at or below the required dBm level indicated in the list of additional discrete frequencies.

15. Connect the equipment of Step 14 to the biconical antenna and measure level at 121.5 MHz. Record on TDS 2.

16. Connect the equipment to the log conical antenna and measure level at 243 MHz, 401.65 MHz, and 406.05 MHz. Record on TDS 2.

17. The measurements of Steps 15 and 16 should be at ambient level and no narrowband frequencies above the maximum level should be detected at those frequencies.

18. Program the signal analyzer for the frequency range of 2010 to 2040 MHz. Verify that the sensitivity of the equipment meets -120 dBm throughout the 2010 to 2040 MHz range.

19. Connect the equipment of Step 18 to a double-ridged horn antenna and record the levels at the frequency range and specific frequency described in Step 18. Record on TDS 2.

20. The measurements of Step 19 should be at ambient level and no narrowband frequencies should be detected at the specified frequencies.

21. Repeat Steps 15 and 16 without the amplifier and perform a measurement of the remaining frequencies on the list of additional frequencies in paragraph 3.4.6 and Figure 8. Record on TDS 2.

22. Connect the equipment to the biconical antenna and measure the SAR frequency levels at 118.0 - 121.4 MHz and 121.5 - 125.0 MHz. Record on TDS 2.

23. Connect the equipment to the log spiral antenna and measure the SAR frequency levels specified on TDS 2, starting with the 236.0 - 240.0 MHz frequency range. Record results on TDS 2.

3.4.7 ***RE04 test.*** This test is performed to determine the level of magnetic radiation at a distance of 1 meter from the AMSU-A instrument as specified in paragraph 3.5.2 of IS-3267415.

3.4.7.1 ***Test equipment.*** The following equipment or equivalent is required for this test:

a. Gauss Meter Model 9901 with Magna Probe BEL-MOX-99-2506, FW Bell (rental), or Analog Voltmeter, HP 4288, with 3529A Magnetometer Probe.

3.4.7.2 ***Test limits.*** The AMSU instrument shall not generate magnetic fields that exceed 100 gamma (1 milligauss) at a distance of one meter from the center of the instrument in all directions. The METOP requirement shall not generate magnetic fields that exceed 130 kgamma (1.3 gauss) at a distance of one meter from the center of the instrument in all directions. The limit for METOP is for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.7.3 ***Test procedure***

3.4.7.3.1 ***Preparations (magnetic field)***

1. Place the AMSU instrument in an area that provides sufficient earth magnetic field cancellation that the ambient of 1 milligauss one meter from the center of the test area is obtainable (see Figure 10).

2. Allow the gauss meter to warm up properly and calibrate the meter. Fill in equipment log on TDS 3.

3. Direct the gauss meter probe toward the area that produces the lowest gauss level measurement, below the limit and at approximately at mid height of the instrument under test.

3.4.7.3.2 ***Test steps***

1. Move the AMSU instrument, on the wooden fixture, toward the probe to a distance of one meter from the center of the instrument to the point of the probe.

2. Rotate the instrument until the connector side is facing the probe.

3. Measure the magnetic field emissions of the AMSU instrument with the unit deactivated. Collect test data of the magnetic field intensity by rotating the equipment clockwise and taking measurements at 30 degree intervals, as a minimum. Record results and note level and location on TDS 3.

4. At the points of maximum detection, repeat measurements with the instrument activated and operating in the IN ORBIT mode. Note difference in level. If levels exceed previous measurement levels, repeat Step 2 with the unit activated.

5. Review recorded data. If measurements are within the 100 gammas (1 milligauss) at one meter from the instrument in all directions, the test is completed. If measurements exceed the limit, measure the ambient and proceed to Step 6 or Step 7.

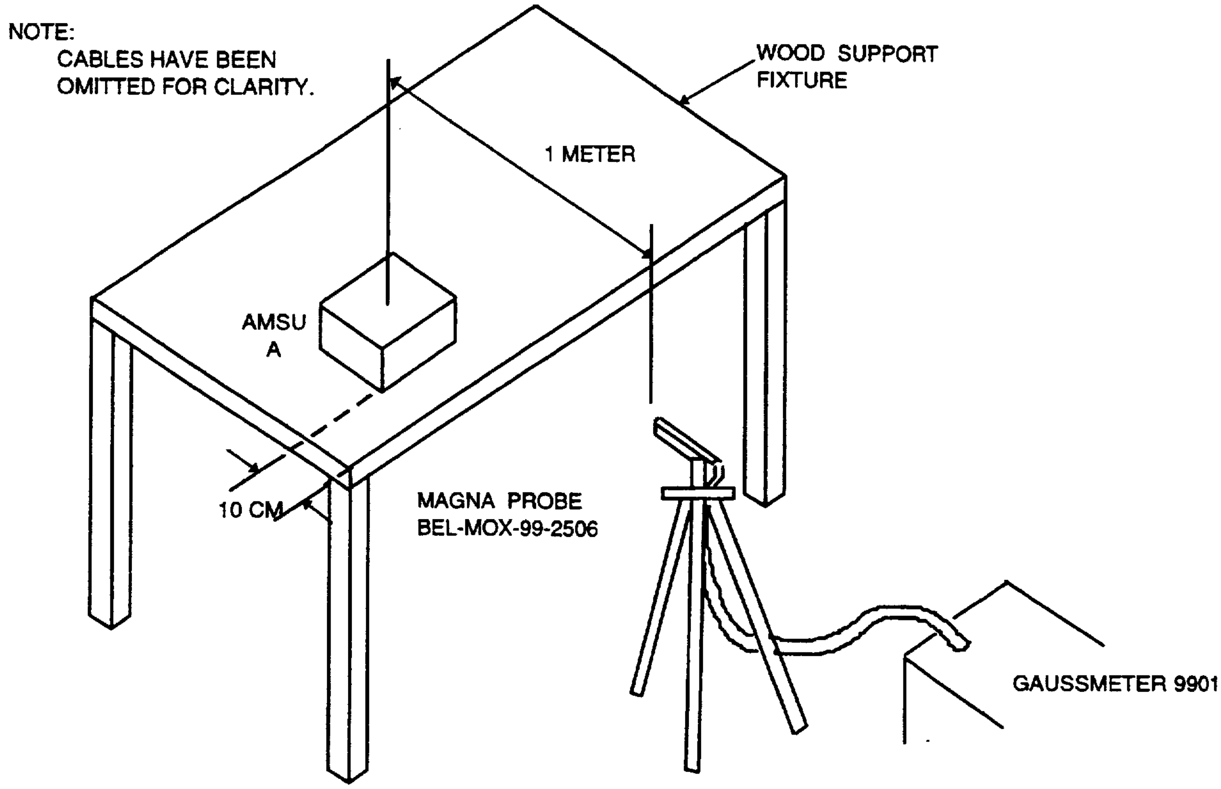


Figure 10. RE04 Test Setup

NOTE

> Measurements that exceed the 1 milligauss limit because the interconnecting cable reduces the distance between the test probe and the UUT are exempted from this requirement. (Waiver/Deviation Request/Approval, D016.)

6. In the event that the ambient level does not meet the requirement and the ambient cannot be reduced further due to facility or area limitations, a minimum of three correlatable measurements shall be made in the axis of maximum field intensity but at a shorter distance than 1 meter. The measured levels shall be able to provide an approximate field intensity when projected to the 1-meter distance requirement. Measurements and calculations of the ambient magnetic field shall be recorded and shall be part of the test data package.

7. In the event that the measured level exceeds the one milligauss required level, the measurements shall be made to determine the location of the center of the magnetic dipole moment producing the out-of-limit condition. A minimum of three correlatable measurements along an axis are required to plot the magnetic field.

8. Record all measured data, indicating level and position of the probe. Note opposing magnetic dipole moments, shield leakage, and all other pertinent data.

9. Repeat measurement within ten inches above and below the mid-height probe placement of 3.4.7.3.1 (3).

3.4.8 ***CS01/CS02 test.*** This test shall be used to determine if the AMSU system is susceptible to electromagnetic energy in the frequency range of 30 Hz to 150 kHz injected in the main power leads. The instrument shall be operated in the IN ORBIT mode. In addition, the METOP shall meet susceptible energy in the frequency range of 100 kHz to 50 MHz.

3.4.8.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Isolation Transformer, Solar Type 6220-1A

b. Amplifier, McIntosh Model MC-2205

c. Oscilloscope, Tektronix 7623

d. Signal Generator*, HP 83623A

e. Function Generator, HP 3325

f. Coupling Capacitor*, Solar 7415-1

g. Digital Voltmeter, HP 3455A.

h. Attenuators*, HP 355 C/D

i. Oscilloscope*, Tek TDS 380

j. Amplifiers*, Ailtech 5001, 5020B

k. Current Probe*, Ailtech 91550-2B

l. Spectrum Analyzer*, HP 8566

m. Decoupling Coil*, 20 μH

n. LISN* per Figure 1

o. Filter box, Aerojet, T-1289992-1.

3.4.8.2 ***Test limits.*** The performance characteristics of the AMSU instrument shall be met when the voltage of Figure 11 in the frequency range of 30 Hz to 150 kHz is applied to the input power terminals. The METOP shall be subject to a common mode sinusoidal noise of 300 mVp-p in the frequency range of 100 kHz to 50 MHz. The limit for METOP is for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.8.3 ***Test procedure***

3.4.8.3.1 ***Preparations***

1. Connect the test equipment as shown in Figure 12. Fill in Equipment Log on TDS 4.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3. Cognizant of the power line under test, perform the functional test for susceptibility as indicated in Table V.

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* For METOP Test step 10 only.

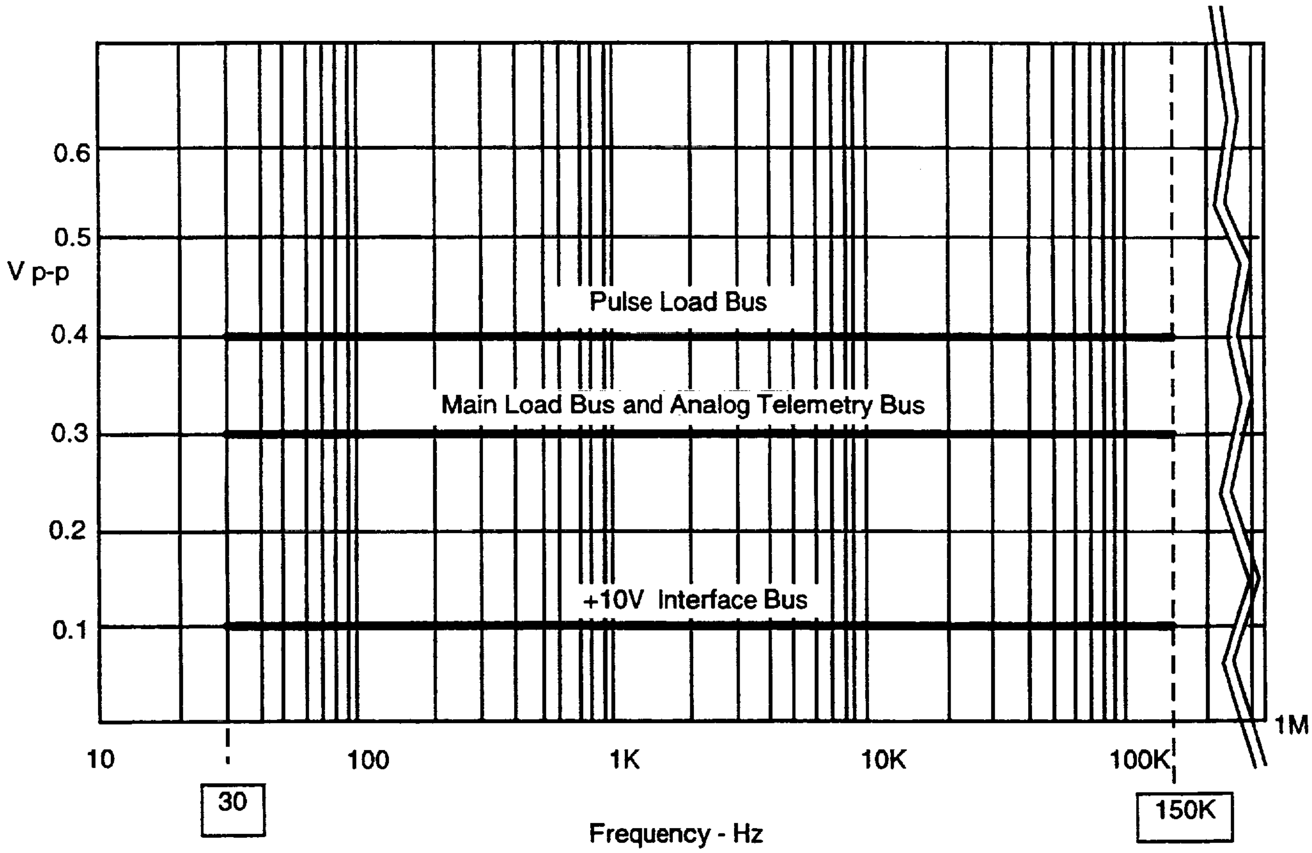
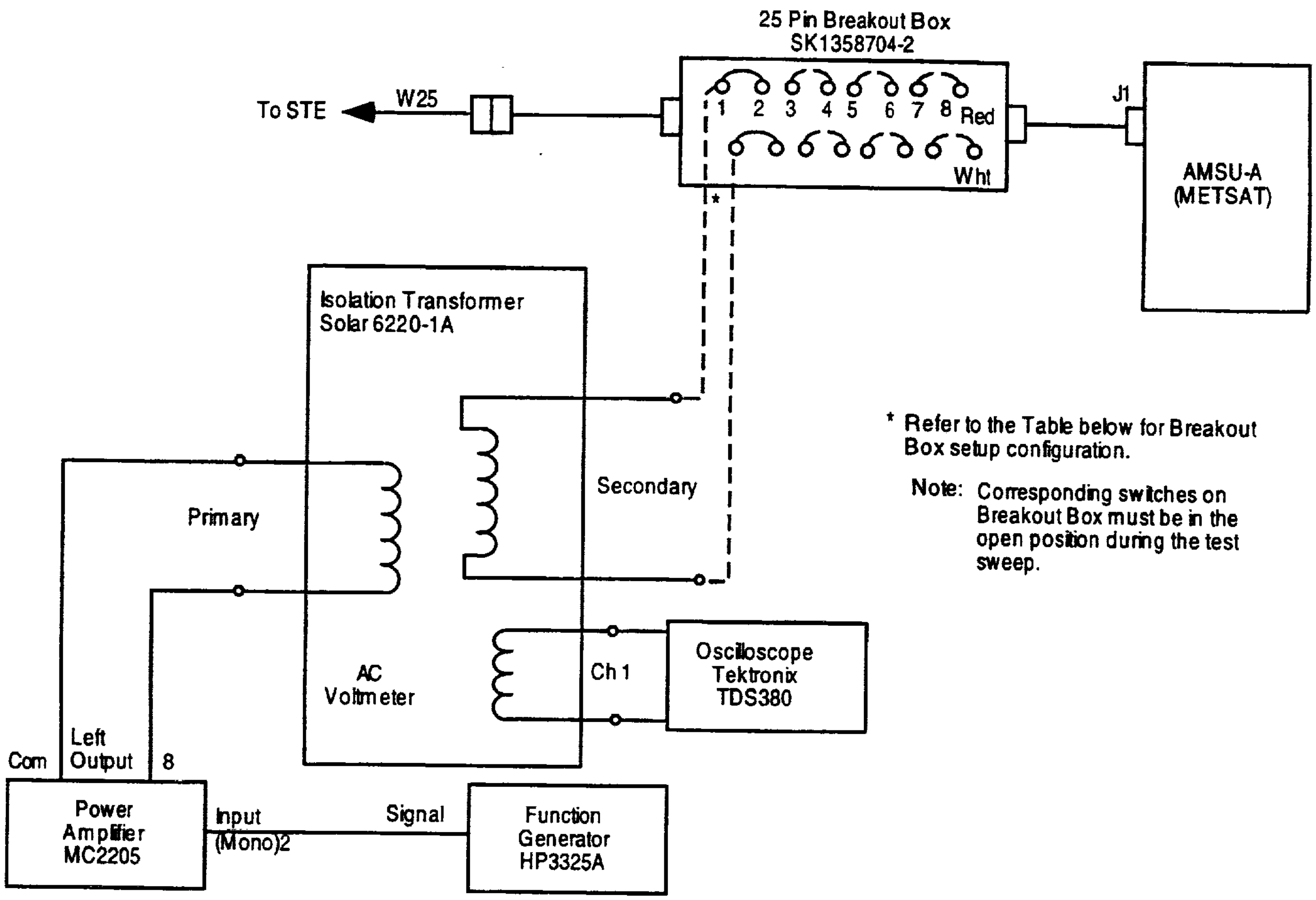


Figure 11. Ripple and Noise Susceptibility Limit



Test Type	Breakout Box Setup Configuration								Open Corresponding Switch
	B/O Box Terminal Jumpers				Transformer tp B/O Box Connection				
	From	Row Color	To	Row Color	From	Row Color	To	Row Color	
+28 V Main Load	1	Red	2	Red	1	Red	1	White	1, 2
	1	White	2	White					
28 V Main Load Rtn	3	Red	4	Red	3	Red	3	White	3, 4
	3	White	4	White					
+28 V Pulse Load	5	Red	6	Red	5	Red	5	White	5, 6
	5	White	6	White					
28 V Pulse Load Rtn	7	Red	8	Red	7	Red	7	White	7, 8
	7	White	8	White					
+28 V Analog Telemetry					9	Red	9	White	9
28 V Analog Telemetry Rtn					10	Red	10		10

Figure 12. CS01/CS02 Test Setup (Differential Mode)

Table V. Functional Test for Susceptibility

Power line Under Test	Specification	Test Type	Data Monitor Point
Main Load Bus	AE-26156/3 (A1) AE-26156/4 (A2)	Relative Radiometer NEΔT Measurements*	– –
Pulse Load Bus	AE-26156/3 (A1) AE-26156/4 (A2)	– –	Warm Calibrate** Warm Calibrate **
Analog Telemetry Bus	AE-26156/3 (A1) AE-26156/4 (A2)	– –	Full Print Data page 8 Full Print Data page 3
+10V Interface Bus	AE-26156/3 (A1) AE-26156/4 (A2)	Scanner Commands Verification (Step 1 only)	Scanner A1/A2 Power Scanner A2 Power

CAUTION

Do not connect the isolation transformer on the high side and return lines simultaneously, without loading the secondary winding of the transformer not used for test with a 1 ohm resistor.

3.4.8.3.2 *Test steps*

1. Apply power to all the test equipment except the power amplifier.

2. Set function generator to scan from 30 Hz to 150 kHz, with the following frequency ranges being swept at a rate of 90 seconds per range:

   30 - 300 Hz　　　　3.0 - 30.0 kHz

   300 Hz - 3.0 kHz　　　　30.0 - 150.0 kHz.

3. Set the scan mode to SINGLE Sweep.

4. Monitor the output signal with an oscilloscope and adjust the output level to the indicated voltage requirement.

5. Set the appropriate switches to the OFF position on the breakout box.

6. Apply power to the power amplifier and adjust the amplifier and generator levels to obtain levels on the display that are equal to or greater than the levels indicated in Figure 11.

7. Monitor the test sample for errors and at selected frequencies get a printout of the monitored channel's performance data.

8. Record on TDS 4 the completion of scanning of each function generator's tuning range. Record each frequency at which a failure occurs and the interference level threshold for failure.

9. Repeat Steps 5 through 8 on the power leads listed in 3.4.4.2.c, or Table A-III of Appendix A, or both.

10. The METOP instrument shall be connected as shown in Figure 13 or 14.

* One sample of room ambient NEΔT will be measured. Alternatively, distribution measurements are to be performed.
** From STE Digital A Data Command menu

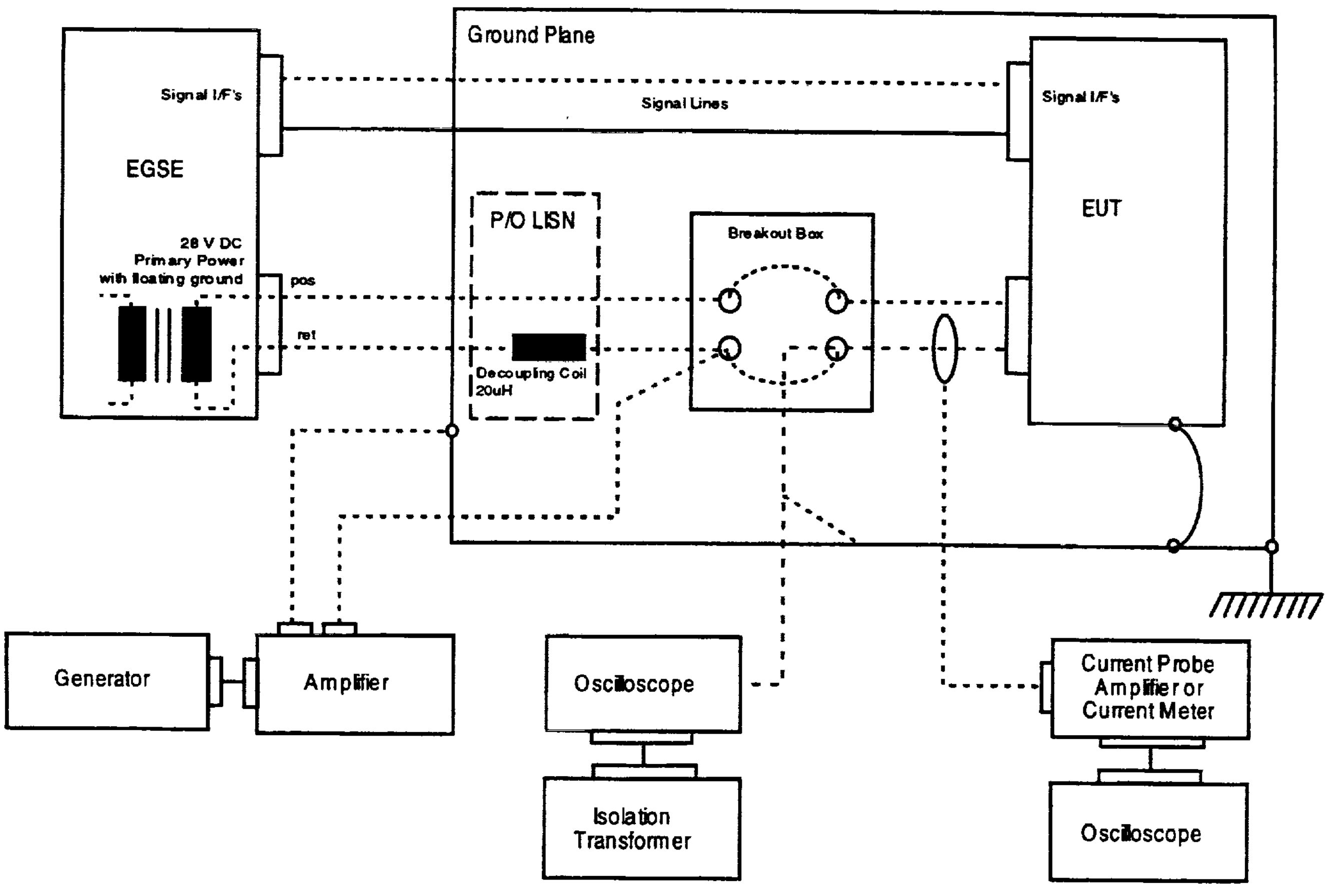


Figure 13. CS02 Common Mode Noise Test on the +28V Main Bus

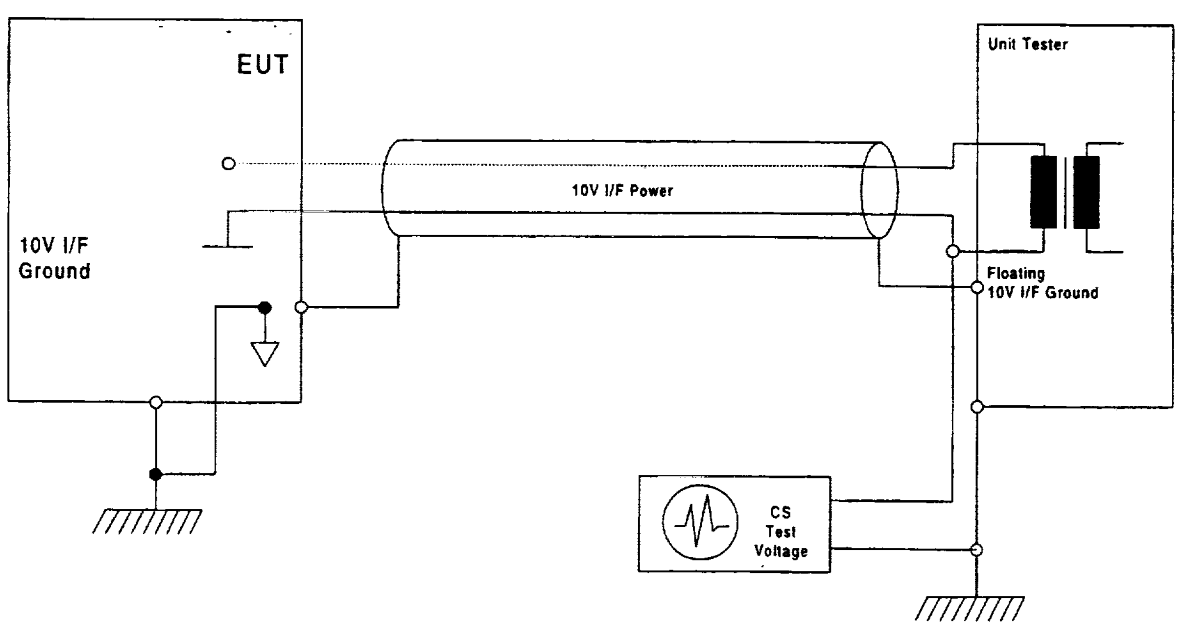


Figure 14. CS02 Common Mode Noise Test on the +10V Interface Bus

11. Apply the power to the test equipment.

12. Sweep the function generator from 100 kHz to 50 MHz in a minimum of five (6) frequency bands. Each frequency range shall be swept at a 90 second rate. Perform data collection test in accordance with Appendix C during the test sweep (obtain a baseline before starting the frequency scans, and ensure that the level is as low as possible).

13. Monitor the output signal with an appropriate meter and adjust the level as required. Record on TDS 5 the completion of scanning of each function generator and voltage level range.

14. Monitor the test sample for errors.

15. Record on TDS 5 the completion of each range and each frequency at which a failure occurs and the threshold level in case of a failure to meet the requirement.

3.4.9 ***CS06 test.*** This test shall be used to determine if the AMSU system is susceptible to electromagnetic energy from a spike appearing on its ungrounded power leads. The instrument shall be operated in the IN ORBIT mode.

3.4.9.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Transient Generator, Solar 7054-1

b. 10 μF Feedthrough Capacitors, Solar 6512-106R. METOP will use LISN's as shown in Figure 1.

c. Oscilloscope, Tektronix 7623.

3.4.9.2 ***Test limits.*** No failures shall occur when the voltage waveform of Figure 15 is applied to the input power line, at the level and polarity indicated below:

Bus	Spike Level
+28V Main Bus	10V positive, 12V negative
+28V Telemetry Bus	10V positive, 12V negative
+28V Pulse Load Bus	8V positive, 13V negative
+10V Interface Bus	1V positive, 1V negative

3.4.9.3 ***Test procedure***

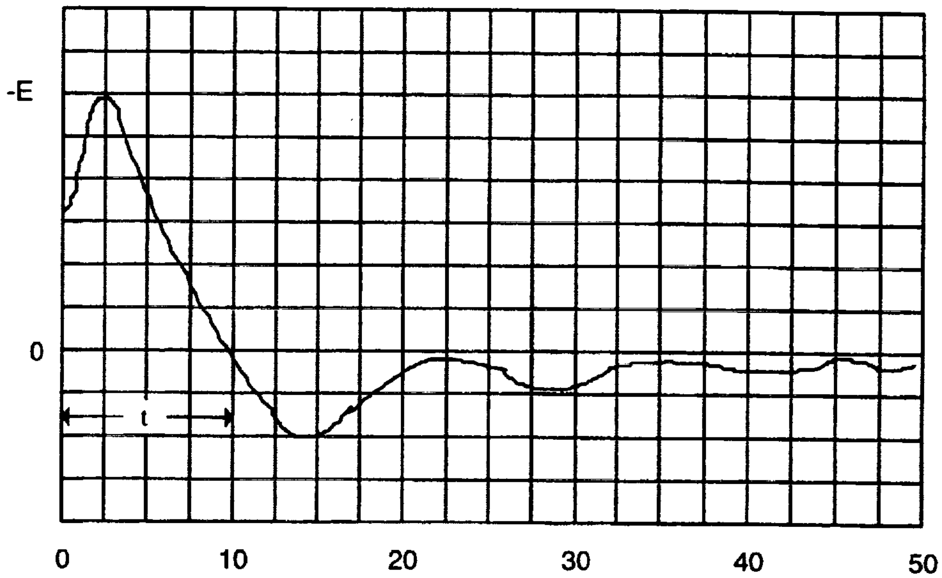
3.4.9.3.1 ***Preparations***

1. Adjust the generator to produce the spike of Figure 15 to the level specified in 3.4.9.2.

2. Connect the test equipment per Figure 16. Place switches 1 through 23 on the Breakout Box to the OPEN position. Fill in Equipment Log on TDS 6.

3. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

4. Cognizant of the power line under test, perform the functional test for susceptibility as indicated in Table III.



-E = AS SPECIFIED IN 3.4.9.2.
t = 10 MICROSECONDS.

Figure 15. CS06 Transient Waveform

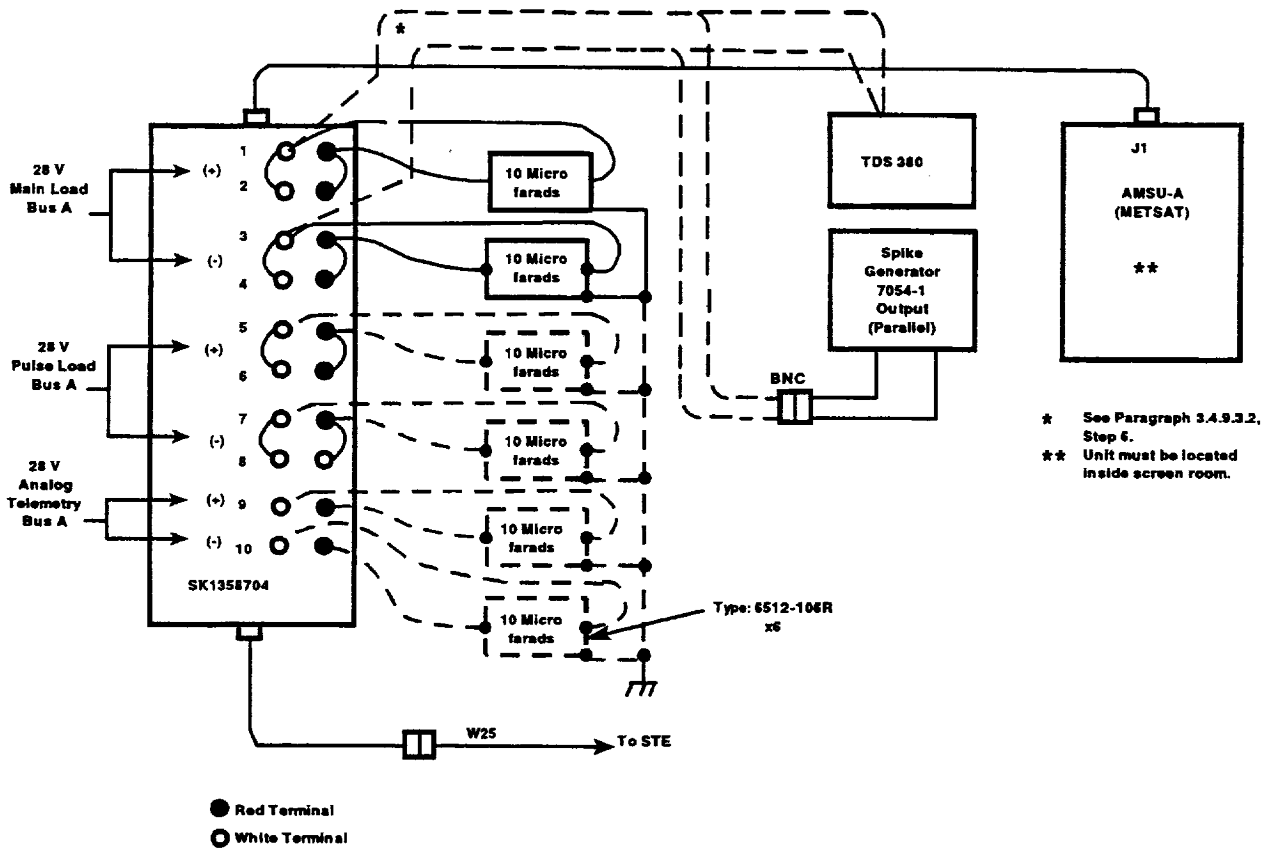


Figure 16a. CS06 Test Setup (Differential Mode)

3.4.9.3.2 *Test steps*

1. Apply the spike at a 10 pps rate for 5 minutes to the main power line.
2. Monitor the test sample for errors.
3. Reverse the spike polarity and level as indicated in 3.4.9.2. Repeat Steps 1 and 2.
4. Record the completion of each test on TDS 6. If failures occur, record the pulse amplitude and polarity.
5. Repeat Steps 1 through 4 on the main power return line.
6. Repeat Steps 1 through 4 on the other lines listed in 3.4.4.2.d or Table A-III of Appendix A, as applicable.
7. Configure the test equipment as shown in Figure 16b. Close all switches on the Breakout Box, leaving switches 12, 13, 24, and 25 in the OPEN position.
8. Repeat steps 1 through 4.

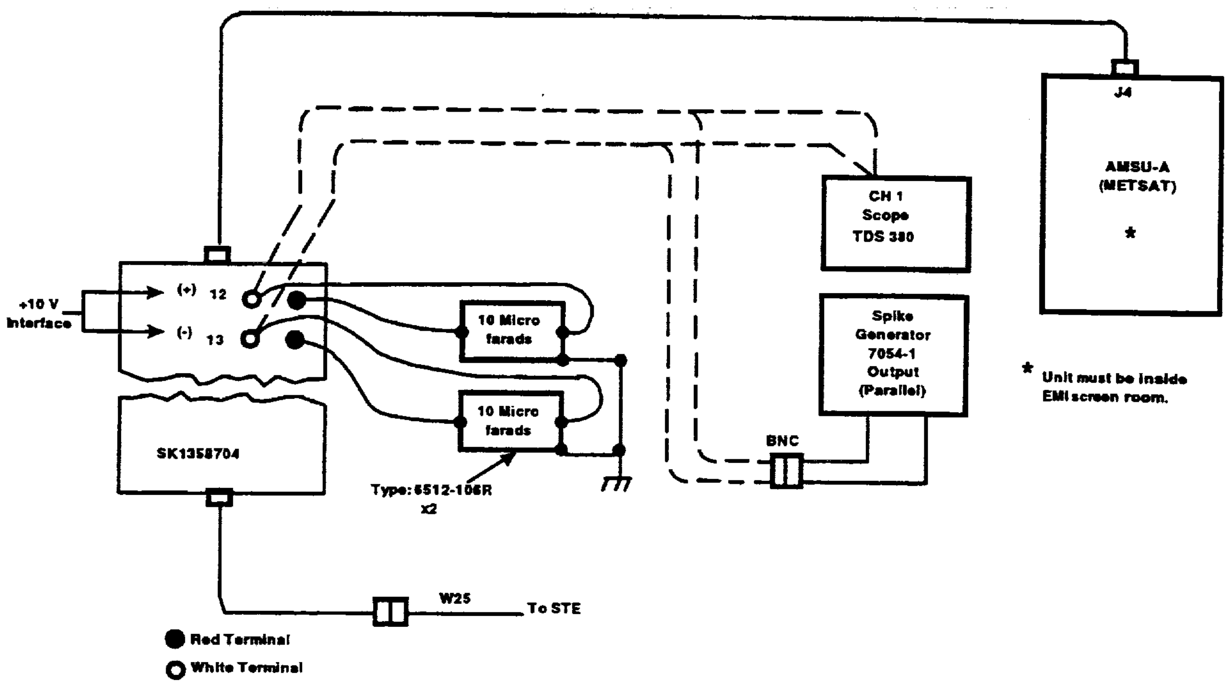


Figure 16b. CS06 +10 V Interface Test Setup (Differential Mode)

3.4.10 ***Radiated susceptibility test, RS03.*** This test shall be used to determine if the AMSU system is susceptible to electric fields. The instrument shall be operated in the IN ORBIT mode.

3.4.10.1 ***Test equipment.*** The following equipment or equivalent is required for this test:

a. Spectrum Analyzer, HP 8566B

b. Frequency Synthesizer, HP 3325

c. Amplifier, AIL-Tech Models 5001, 5020B, 3552B, and 15100B; AR 100W1000M7 (Rental)

d. Travelling Wave Tube Amplifier (TWTA), Varian Models VZL-6941K1, VZS 6951K2, VZC 6961K2, VZM 6991K3; VZL-6942G1, VZC6962G1 (Rentals)

e. Field Strength Sensor, IFI EFS-1

f. Antenna, AIL-Tech Models 96003, 93490-1, and 93491-2

g. Antenna, Ridged Guide, Electro-Metrics Model RGA-180

h. Signal Generator, HP 83623A

i. Digital Voltmeter, HP 3455A

j. Electric Field Monitor, Amp Research, FM 2000, 10kHz to 1 GHz, with electric field probe PM 2000 (rental)

3.4.10.2 ***Test limits.*** The test will be performed at the radiated levels and frequencies indicated in Table VI. If susceptibility is observed at any frequency, the field strength will be lowered to determine the threshold level.

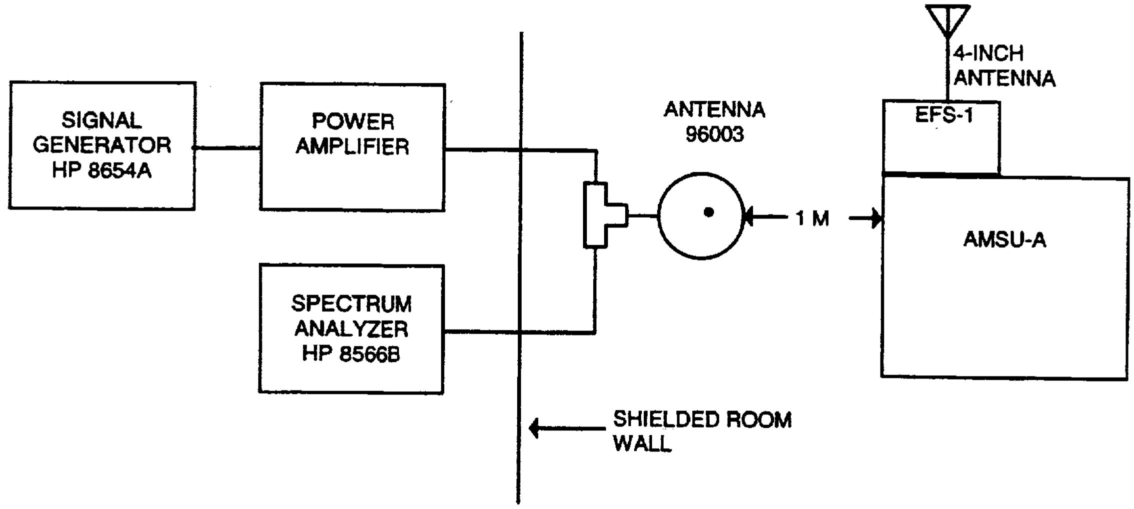
Table VI. Additional Test Frequencies

Frequency (MHz)	METSAT		METOP**	
	AMSU-A1 (V/M)	AMSU-A2 (V/M)	AMSU-A1 (V/M)	AMSU-A2 (V/M)
137.35/137.77		5.0		
137.1 *	-	-	37	32
137.5/137.62	6.9	9.0	-	-
468 *	-	-	12	18
1544.5 *	10.5	22.5	14	31
1698.0	9.8	22.5	-	-
1701.3 *	-	-	38	52
1702.5	4.8	8.2	-	-
1707.0	18.4	13.1	-	-
2230.0 *	-	-	10	10
2247.5	4.3	10.3	-	-
5250.0 *	-	-	38	45
7800.0 *	-	-	8	13
14 kHz/500 MHz *	1	1	1	1
500 MHz/1 GHz *	-	-	1	1
1/18 GHz *	-	-	2	2

* Requires modulation of the applied electric field as indicated below:

14 kHz to 18 GHz	Amplitude modulated by a sine wave at 1 kHz with a modulation depth of 50%.
137.1 MHz	Pulsed at 38.25 kHz PRF, 50% duty cycle.
468 MHz	Pulsed at 1 kHz PRF, 50% duty cycle.
1,544.5 MHz	FM, 400 kHz peak, deviation modulation index M = 1.
1,701.3 MHz	Pulsed 2.25 MHz PRF, 50% duty cycle.
2,2230 MHz	Pulsed 4 kHz PRF, 50% duty cycle.
5,250.0 MHz	Pulsed width = 8.22 ms, chirp rate = -50 kHz/ms, PRF = 4.94 and pulsed width = 10.32, chirp rate = ±24 kHz/ms, PRF = 4.94.
7,800.0 MHz	Pulsed 35 MHz PRF, 50% duty cycle.

** For information only. There are no pass/fail requirements.



14 kHz to 10 GHz Radiating Antennas

Manufacturer	Model	Frequency Range
AIL Tech	96003	14 kHz - 30 MHz
AIL Tech	96002	30 MHz - 200 MHz
AIL Tech	93490-1	200 MHz - 1 GHz
Electrometrics	RGA-180	1 GHz - 18 GHz

14 kHz to 10 GHz Power Amplifiers

Manufacturer	Model	Frequency Range
AIL Tech	5001	14 kHz - 10 MHz
AIL Tech	5020B	1 MHz - 200 MHz
AIL Tech	3552B	100 MHz - 520 MHz
AIL Tech	15100B	500 MHz - 1 GHz
Varian	VZL-6941K1	1 GHz - 2 GHz
Varian	VZS-6951K2	2 GHz - 4 GHz
Varian	VZC-6961K2	4 GHz - 8 GHz
Varian	VZM-6991K3	8 GHz - 18 GHz

Figure 17. RS03 Test Setup, 14 kHz to 25 MHz

3.4.10.3 ***Test procedure***

3.4.10.3.1 ***General.*** The output of the oscillator drives a power amplifier and antenna. For frequencies below 200 MHz a field-strength sensor determines the field strength and maintains manual leveling of the power amplifier output. Above 200 MHz the output of the power amplifier shall be set, when possible, to develop 2 volts per meter up to 500 MHz. If susceptibility occurs, the level will be lowered to determine the threshold.

3.4.10.3.2 ***Preparations***

1. Connect the test equipment as shown in Figure 17 using the broadband antenna, AIL-Tech 96003. Fill in Equipment Log on TDS 6.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3. Perform the functional test for susceptibility in accordance with the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4.

3.4.10.3.3 ***Test steps***

1. Power on all test equipment for a 15-minute warmup.

2. Set the generator level control to REAR ONLY.

3. Adjust the signal generator for a 160mV output signal.

4. Adjust the electric field monitor to read the generated electric field on all three orthogonal axes. Since the sensitivity presented in the monitor's digital display is 1.3 V/m minimum, adjust the electric field to read 2 V/m.

5. Adjust the level to that indicated in Table VI throughout the frequency range of 14 kHz to 1 MHz, in the following steps:

   14 - 50 kHz   100 - 500 kHz

   50 - 100 kHz   300 - 1000 kHz.

6. As the frequency range is being scanned at a 90 sec rate, check the leveling by varying the signal drive to the power amplifier.

7. At 1 MHz, switch the antenna FUNCTION switch to the 1 to 30 MHz range.

8. Adjust the level control to the power amplifier to the required level in the frequency range of 1 MHz to 30 MHz in the following steps:

   1 - 5 MHz   5 - 10 MHz   10 - 30 MHz.

9. Monitor the Function Test for each channel by performing data collection test in accordance with Appendix C. Record observation on TDS 7 and attach a printout of the monitored channels' performance data (obtain a baseline before starting the frequency scans, and ensure that the level is as low as possible).

10. Replace the broadband antenna with the biconical antenna.

11. With the frequency set at 30 MHz, adjust the output of the power amplifier for 2 volts per meter.

12. Operate the test equipment controls during the scan. Monitor the test sample for errors while scanning the frequency range between 25 and 200 MHz and recording the data as required in Step 9, using the following frequency ranges:

    30 - 50 MHz   50 - 100 MHz   100 - 200 MHz.

13. Connect the test equipment as shown in Figure 18. Calibration of a radiated level with a second antenna is very time consuming and is only used for special critical frequencies. In cases where the power amplifier gain is relatively flat, the electric field will be calibrated for the required voltage at the lowest level of the

frequency spectrum. To monitor or calibrate radiated level, or both, use the electric field monitor and antennas indicated in 3.4.6.

NOTES:

1. DC BOND OF GROUND PLANE TO ENCLOSURE SHALL NOT EXCEED 2.5 MILLIOHMS.
2. MOST CABLES HAVE BEEN OMITTED FOR CLARITY.

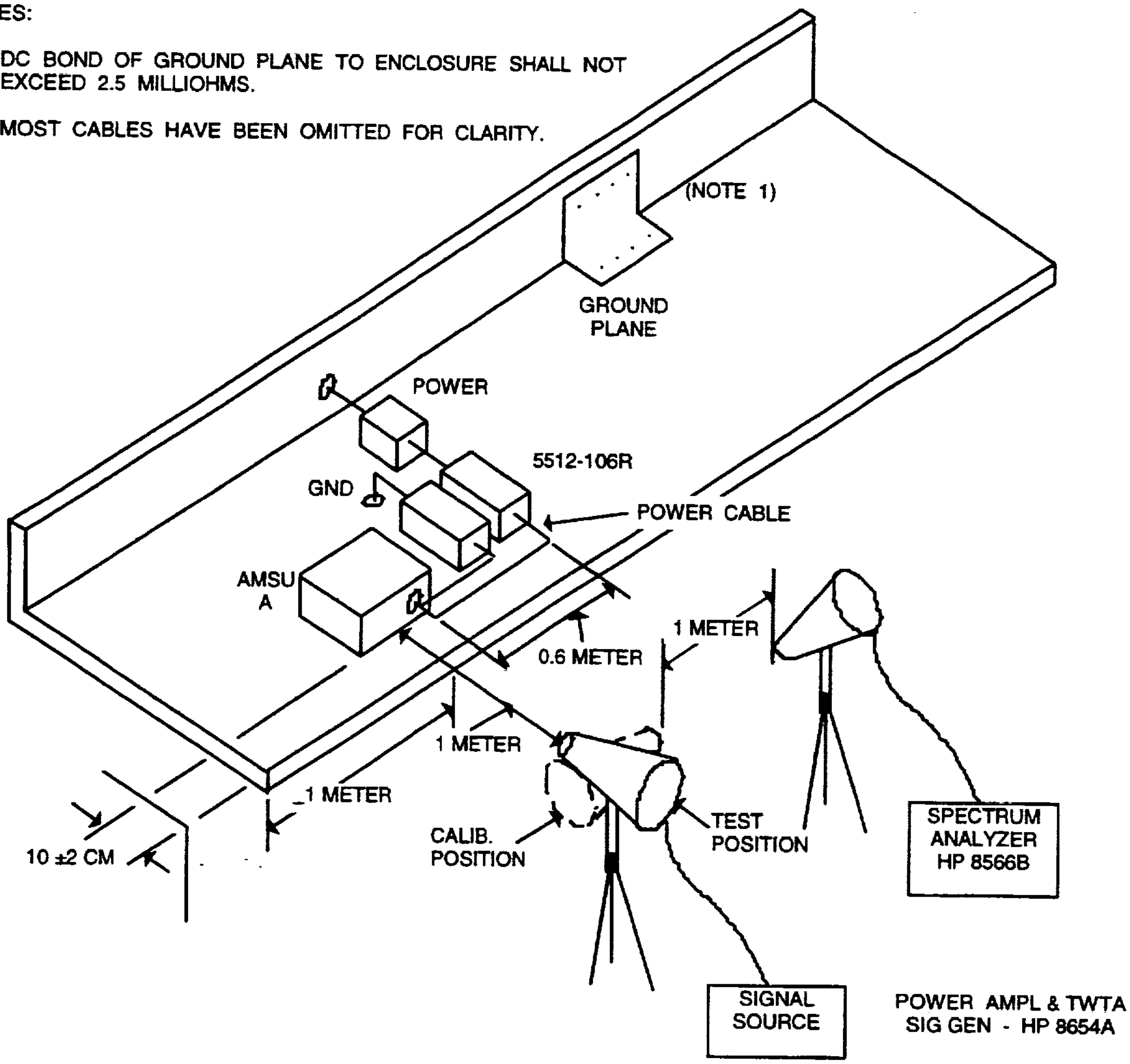


Figure 18. RS03 Test Setup, 200 MHz to 12 GHz

14. Adjust the gain of the amplifier for 2 volts per meter field strength at 200 MHz. Monitor the level with the electric field monitor or by monitoring the power input to the antenna via a directional coupler. Set the level using the following equation:

$$P_T(dBm) = [30\ dB + 10\ Log_{10}(4\pi) + 20\ Log_{10} R + 20\ Log_{10}(E) - 10\ Log_{10}(377) -$$

$$10\ Log_{10}(G_T)\ ] - [Directional\ Coupler / Cable\ Losses]$$

Where: P_T = Transmitter power (dBm)

R = Distance from transmitting antenna (meters)

E = Required electric field intensity (volts/meter)

G_T = Gain of the transmitting antenna.

(Precalculated charts for the desired field strength are available from the Test Engineer.)

15. Make a scan at this level while monitoring the spectrum analyzer to maintain the required power level in dBm.

16. If susceptibility occurs, reduce the output power of the amplifier and determine the susceptibility threshold. Record all pertinent information on TDS 7.

17. Connect the log conical (or horn) antenna as shown on in Figure 18 and connect to the appropriate amplifier.

18. Adjust the gain of the amplifier to the power level indicated in the precalculated chart to produce 2 volts per meter from 200 to 500 MHz (18 GHz for the METOP instrument) or use the calibration procedure of Step 13.

19. If susceptibility occurs, reduce the output power of the power amplifier and determine the susceptibility threshold. Record all pertinent information on TDS 7.

20. Using the appropriate antenna, repeat susceptibility testing at the specific levels and frequencies indicated in Table VI, through the frequency range of 500 MHz to 1 GHz.

21. Obtain a plot of the spectrum analyzer "Peak Search" presentation indicating frequency and attained level.

22. Record the completion of the frequency band and appropriate information in the event of a susceptibility indication.

23. Continue the test with the same set up throughout the frequency range of 500 MHz to 1 GHz at 2 volts/meter level. Use the following frequency bands:

200 – 500 MHz   500 – 1000 MHz

24. Using the horn antenna and the TWT amplifiers, cover the frequency range of 1 to 18 GHz. Use frequency range steps that provide a reasonably flat response of the amplifier.

25. Using the appropriate antenna and amplifier, perform the special frequency test indicated in Table VI.

26. Calibrate the applied field with the two antenna methods.

27. Supply the indicated frequency at the required level for 90 seconds. At the mid interval of the applied time, rotate the antenna to the other polarization.

28. Record the completion of the frequency test and all appropriate information in the event of a susceptibility indication.

29. Repeat steps 25 through 28 for the other discrete frequencies.

4. QUALITY ASSURANCE PROVISIONS

4.1 ***Responsibility for inspection.*** Aerojet Quality Assurance shall inspect in accordance with the requirements of this test procedure, 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 Aerojet Electronic Systems Division, Azusa facility.

4.2 ***Monitoring procedures.*** All tests shall be monitored by Quality Assurance.

4.2.1 ***Test equipment.*** Test equipment calibration procedures shall comply with the requirements of MIL-STD-45662.

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 Report (TAR) and alert the design assurance and quality engineers. Except for Conducted and Radiated Emission (CE and RE) tests, 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 spectrum of interference is required in order to formulate a plan of action. Conducted and Radiated Susceptibility (CS and RS) tests can be continued only after assuring that the data collection activity will not damage or stress any of the components of the AMSU-A instrument. The cognizant reliability engineer, quality assurance engineer, and the system or responsible test engineer shall jointly develop the FAS. Analysis and reporting shall be performed per Aerojet procedures.

4.5.2 ***General.*** A test report shall be prepared in accordance with paragraph 4.5.2.1.1 at the successful completion of testing. This report shall include 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 specification obtained from screen printouts and plots, and oscilloscope photographs or magnetic recordings. 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:

Engineer: ____
(Signature) (Date)

Quality Control: ____
(Signature) (Date)

Customer representative: ____
(Signature) (Date)

Test Paragraph No.: ____

Subassembly/Assembly Serial No.: ____

The report shall also include a certification statement.

4.5.2.1 ***Acceptance test reports***

4.5.2.1.1 ***Format.*** The acceptance test report shall be prepared and shall include, as a minimum, the following:

a. Title page

b. Table of contents

c. Summary

d. Reason for test

e. Abstract, conclusions, and recommendations

f. References

g. Results of tests

h. Test data.

4.5.2.1.2 ***Test data.*** The test data included in the report shall be that which was obtained in the tests specified herein and recorded on the Test Data Sheets (TDS), printouts, and plots.

5. PREPARATION FOR DELIVERY

Not applicable.

6. NOTES

6.1 ***Intended use.*** The intended use of this process specification is to establish the general methods and acceptance test procedures for Electromagnetic Interference (EMI), Electromagnetic Radiation (EMR), and the Electromagnetic Compatibility (EMC) procedures for the Advanced Microwave Sounding Unit - A (AMSU-A).

6.2 ***Abbreviations and acronyms***

AF	Audio frequency
AM	Amplitude modulated
AMSU	Advanced Microwave Sounding Unit
BB	Broadband
CCA	Card cage assembly
CCS	Computer Controlled System
CE	Conducted emissions
C.P.	Current probe
CRT	Computer screen display
CS	Conducted susceptibility
DMM	Digital multimeter
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
EMISM	Electromagnetic interference safety margin
EMR	Electromagnetic radiation
ESD	Electrostatic discharge
FAS	Failure Analysis Strategy
FM	Frequency modulated
Gen.	Generator
GFE	Government furnished equipment
GIIS	General Instrument Interface Specification
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
HF	High frequency
HP	Hewlett-Packard
IFI	Instruments for Industry
ITT	International Telephone and Telegraph
LPT	Limited Performance Test
RE	Radiated emissions
RF	Radio frequency
RIFI	Radio interference, field intensity

RMS	Root mean squared
RS	Radiated susceptibility
SHF	Super high frequency
SP6T	Single pole six throw
SS	Solid state
STE	Special Test Equipment
TAR	Test Anomaly Report
TDS	Test Data Sheet
TWTA	Traveling wave tube amplifier
UHF	Ultra high frequency
UIIS	Unique Instrument Interface Specification
VHF	Very high frequency

6.3 *Changes*. The outside margins of this document have been marked to indicate where modifications, deletions, or additions have been made since the previous issue. This is done solely as a convenience to users, who are cautioned to evaluate the requirements of this change and the parent standard based on the entire content as written, regardless of the marginal notations and relationship to the previous issue.

10. APPENDIX A TEST INSTRUMENTATION

10.1 ***Test instrumentation list for EMI/EMC tests.*** See Table A-I.

10.2 ***Relative gain of the 94455-1 biconical antenna.*** The calculations for the gain of the biconical antenna and the tuned dipole antenna referenced to an isotropic radiator are listed in Table A-II. The delta difference of the antennas will provide relative gain of one with respect to the other. The basic equation for the calculations is:

$$\Delta F = 20Log_{10} f - 10Log_{10} G - 29.78\ dB/m$$

Where: ΔF = Antenna Factor in dB

f = Frequency in MHz

G = Gain (power ratio).

Table A-I. Test Instrumentation List for EMI/EMC Tests (Sheet 1 of 2)

Description	Manufacturer*		Test Usage			
	Name	Model No.	CE	RE	CS	RS
EMI RECEIVERS AND METERS						
Calculator-Controlled EMI System, 20 Hz-1 GHz, containing:	Electro-Metrics	CCS-125	X	X		
(a) EMC-10 (20 Hz-50 KHz)						
(b) EMC-25 (10 KHz-1 GHz)						
(c) HP-9836S Calculator						
(d) DIU-125, DSA-125, SU-125						
Spectrum Analyzer	Hewlett-Packard	8566B	X			
(a)Computer		9836				
(b)Plotter		7090A				
(c)Printer		2678A				
Oscilloscope	Tektronix	7626			X	
Gauss Meter	FW Bell	9901		X		
Digital Voltmeter	Hewlett-Packard	3455A			X	
SIGNAL GENERATORS/SOURCES						
Function Generator,	Hewlett-Packard	3325			X	
Sweep Generator	Wiltron	6659B			X	X
RF Transient Generator	Solar Elect.	7054-1			X	
AMPLIFIERS						
Audio Amplifier, 200W. 20 Hz-50 KHz	McIntosh	MC-2205			X	
Broadband Linear, 50W, 10- KHz-10 MHz	AIL Tech.	5001				X
Broadband Linear, 50W, 1-200 MHz	AIL Tech.	5020B				X
Broadband Linear, 50W, 100-520 MHz	AIL Tech.	3552B				X
Broadband Linear, 20W, 500-1000 MHz	AIL Tech.	15100B				X
TWTA, 20W, 1-2 GHz	Varian	VZL-6541K1				X
TWTA, 20W, 2-4 GHz	Varian	VZS-6951K2				X
TWTA, 20W, 4-8 GHz	Varian	VZC-6961K2				X
TWTA, 20W, 8-18 GHz	Varian	VZM-6991K3				X
Amplifier (Amp), 2-4 GHz	MITEQ	AFD3-025-035-13		X		
Amp, 60dB, 100-450 MHz, NF - 1.5 dB	RHG Elect Lab	1CLW300CM		X		
Amplifier	Hewlett-Packard	HP8447F	X	X		
Amplifier	Hewlett-Packard	HP-461A	X	X		
CURRENT FIELD PROBES						
RF Current Probe, 30 Hz-100 MHz	AIL Tech	91550-1	X			
Magnetometer Probe	Hewlett-Packard	3529A		X		
Magna Probe	FW Bell	BEL-MOX-99-2506		X		
Field Strength Sensor	IFI	EFS-1				X
ANTENNAS						
Double-Ridged Guide Antenna, 1-18 GHz	EMCO	3115		X		X
Log Spiral Antenna, 0.2-1 GHz	AIL Tech.	93490-1		X		X
Biconical Antenna, 20-200 MHz	AIL Tech.	96002		X		
Parallel Element, 200V/m, 10 KHz-30 MHz	AIL Tech.	96003				X
Log Spiral, 200 MHz to 1 GHz	EMCO	3101		X		
Biconical, 20-200 MHz	EMCO	3104		X		
Active Rod w/Counterpoise, 14 kHz to 30 MHz	EMCO	3301B		X		

* Or Equivalent

Table A-I. Test Instrumentation List for EMI/EMC Tests (Sheet 2 of 2)

Description	Manufacturer*		Test Usage			
	Name	Model No.	CE	RE	CS	RS
COUPLERS						
Isolation Transformer, 30 Hz-250 kHz	Solar Elect.	6220-1A			X	
PERIPHERALS						
Oscilloscope Camera	Tektronix	C12		X		
Intelligent Serial Thermal Printer	Hewlett-Packard	2673A	X			
ACCESSORIES						
10 μF Feedthrough Capacitor, 1 KHz-1 GHz	Solar Elect.	6512-106R	X	X	X	
MISCELLANEOUS						
Breakout box	Aerojet	–	X	X	X	X
EMI Filter Box	Aerojet	T-1289992-1	X	X	X	X

* Or Equivalent.

Table A-II. Relative Gain of the 94455-1 Biconical Antenna and a Tuned Dipole

Frequency (MHz)	Gain (Numeric)		
	Biconical	Tuned Dipole	Relative Biconical
25	0.036	1.472	-1.436
30	0.054	1.191	-1.137
50	0.173	1.513	-1.34
70	0.777	1.486	-0.709
100	0.617	1.555	-0.938
150	0.549	1.331	-0.782
200	1.171	1.242	-0.071

Table A-III. EMI/EMC Test Performance Matrix
(Qualification Test)

Test Method & Description	Requirement METSAT	Requirement METOP	+28V Main Bus	28V Main Bus Rtn	+28V Pulsed Bus Load	28V Pulsed Bus Load Rtn	+28V Analog Telemetry Bus	28V Analog Telemetry Bus Rtn	+10V Interface Bus	10V Interface Bus Rtn	+28V Safety Heater	28V Safety Heater Rtn	AMSU-A Instrument
CE01 (30 Hz to 20 kHz) DM		X	X	X	X	X	X	X	X	X	X	X	
CM		X	T		T		T		T				
CE03 20 kHz to 50 MHz) DM	X	X	X	X	X	X	X	X	X	X	X	X	
CM		X	T		T		T		T				
CS01/CS02 (30 Hz to 150 kHz) DM	X		X	X	X	X	X	X	X	X			
CS02 (100 kHz to 50 MHz) CM		X		X		X		X		X			
CS06 (Spike) DM	X	X	X	X	X	X	X	X	X	X			
RE02 *	X	X											X
RE04	X												X
RS03	X	X											X

X Test performed on powerline.

T Test performed together with high side and return.

* For Acceptance only, perform electric field radiation frequency range 2010 - 2040 MHz (paragraph 3.4.6) and frequency range of Table IV.

20. APPENDIX B TEST DATA SHEETS

This appendix contains the test data sheets (TDS) for the inspections and test procedures in Section 3.

TEST DATA SHEET 1 (Sheet 1 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 30 Hz to 20 kHz, (DM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figures 2 & 3			
4	28V Main Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3			
7	28V Telemetry Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V PLB	Narrow	See Figures 2 & 3			
7	28V PLB Rtn	Narrow	See Figures 2 & 3			
7	+10V Interface Bus	Narrow	See Figures 2 & 3			
7	10V Interface Bus Ret	Narrow	See Figures 2 & 3			
7	Safety Heater	Narrow	See Figure 4			
7	Safety Heater Return	Narrow	See Figure 4			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ______________ Oper __________ Customer Representative: ______________________

TEST DATA SHEET 1 (Sheet 2 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.2: Emission Measurements, 30 Hz to 20 kHz, (CM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figure 2			
7	+28V Telemetry Bus	Narrow	See Figure 2			
7	+28V PLB	Narrow	See Figure 2			
7	+10V Interface Bus	Narrow	See Figure 2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________________ Engineer: ______________________________

Serial No. ______________________________ Quality Control: ______________________________

Shop Order ______________ Oper __________ Customer Representative: ______________________________

TEST DATA SHEET 1 (Sheet 3 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (DM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figures 2 & 3			
4	28V Main Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3			
7	28V Telemetry Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V PLB	Narrow	See Figures 2 & 3			
7	28V PLB Rtn	Narrow	See Figures 2 & 3			
7	+10V Interface Bus	Narrow	See Figures 2 & 3			
7	10V Interface Bus Ret	Narrow	See Figures 2 & 3			
7	Safety Heater	Narrow	See Figure 4			
7	Safety Heater Return	Narrow	See Figure 4			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ____________ Customer Representative: ______________________

TEST DATA SHEET 1 (Sheet 4 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (CM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figure 3			
7	+28V Telemetry Bus	Narrow	See Figure 3			
7	+28V PLB	Narrow	See Figure 3			
7	+10V Interface Bus	Narrow	See Figure 3			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 2 (Sheet 1 of 3)
3.4.6: RE02 Test

Test Setup Verified: ______________________________
Signature

3.4.6.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

TEST DATA SHEET 2 (Sheet 2 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna/Frequency	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	All except Horn 14 kHz to 1 GHz	Narrow	See Figure 6			
6	All except Horn 14 kHz to 1 GHz	Broad	See Figure 7			
12	Horn, RGA-180 1 to 2 GHz	Narrow	See Figure 6			
15	Biconical, EMCO 3104 121.5 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm			
16	Log Conical, EMCO 3101 243 MHz, 401.65 MHz, & 406.05 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm			
19	Horn, RGA-180 2010 to 2040 MHz with Ampl	Narrow	No narrow-band freq. > -120 dBm			
21	Biconical/Log Conical 59.458 to 751.944 MHz	Narrow	No narrow-band freq. > -60 dBm			
21	400 to 500 MHz	Narrow	-107.1dBm			
21	2 to 18 GHz	Narrow	Figure 3			
21	1217 to 1227 MHz	Narrow	-111.8 dBm			
21	1565 to 1614 MHz	Narrow	-111.2 dBm			
21	2051.9 to 2055 MHz	Narrow	-126.7 dBm			
21	5254.7 to 5255.3 MHz	Narrow	-122.8 dBm			
21	5450 to 5825 MHz	Narrow	-80.7 dBm			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

TEST DATA SHEET 2 (Sheet 3 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna*/Frequency Range (MHz)	Band	Radiation Limit (dBm)	Emissions within limits?		Comments/ Observations
				Yes	No	
22	118.000 - 120.000	Narrow	-100 / Table IV			
22	120.000 -121.450	Narrow	-125 / Table IV			
22	121.450 - 121.485	Narrow	-145 / Table IV			
22	121.515 - 121.550	Narrow	-145 / Table IV			
22	121.550 - 123.000	Narrow	-125 / Table IV			
22	123.000 - 125.000	Narrow	-100 / Table IV			
23	236.000 - 240.000	Narrow	-100 / Table IV			
23	240.000 - 242.925	Narrow	-125 / Table IV			
23	242.925 - 242.975	Narrow	-145 / Table IV			
23	243.025 - 243.075	Narrow	-145 / Table IV			
23	243.075 - 246.000	Narrow	-125 / Table IV			
23	246.000 - 250.000	Narrow	-100 / Table IV			
23	385.100 - 401.100	Narrow	-100 / Table IV			
23	401.100 - 405.900	Narrow	-125 / Table IV			
23	405.900 - 406.000	Narrow	-145 / Table IV			
23	406.1 00 - 406.200	Narrow	-145 / Table IV			
23	406.200 - 411.00	Narrow	-125 / Table IV			
23	411.000 - 425.000	Narrow	-100 / Table IV			
23	396.000 - 401.500	Narrow	-125 / Table IV			
23	401.500 - 401.600	Narrow	-145 / Table IV			
23	401.700 - 401.800	Narrow	-145 / Table IV			
23	401.800 - 406.000	Narrow	-125 / Table IV			

* All frequency ranges are to be performed with antenna in both vertical and horizontal polarization.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 3 (Sheet 1 of 3)
3.4.7: RE04 Test

Test Setup Verified: ______________________________
Signature

3.4.7.3.1 Step 2: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.7.3.2 Step 3: Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.
* Relative to instrument connector side.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 3 (Sheet 2 of 3)
3.4.7: RE04 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.7.3.2 Step 9 (10 inches above): Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.

* Relative to instrument connector side.

TEST DATA SHEET 3 (Sheet 3 of 3)
3.4.7: RE04 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.7.3.2 Step 9 (10 inches above): Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.
* Relative to instrument connector side.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 4 (Sheet 1 of 4)
3.4.8: CS01/CS02 Test

Test Setup Verified: ______________________________
Signature

3.4.8.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.8.3.2: Susceptibility to Injected Electromagnetic Energy on Power Leads, 30 Hz to 150 kHz

+28V Main Power Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ____________ Customer Representative: ______________________

TEST DATA SHEET 4 (Sheet 2 of 4)
3.4.8: CS01/CS02 Test (Cont)

28V Main Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+28V Pulse Load Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

28V Pulse Load Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 4 (Sheet 3 of 4)
3.4.8: CS01/CS02 Test (Cont)

+28V Analog Telemetry Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

28V Analog Telemetry Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+10V Interface Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 4 (Sheet 4 of 4)
3.4.8: CS01/CS02 Test (Cont)

10V Interface Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

*** ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit**

TEST DATA SHEET 5 (Sheet 1 of 2)
3.4.8: CS02 Test (CM)

Test Setup Verified: ______________________________
Signature

3.4.8.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.8.3.2: Susceptibility to Injected Electromagnetic Energy on Power Leads, 100 kHz to 50 MHz, CM

+28V Main Power Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 5 (Sheet 2 of 2)
3.4.8: CS02 Test, (CM) (Cont)

+28V Pulse Load Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+28V Analog Telemetry Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+10V Interface Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 6 (Sheet 1 of 2)
3.4.9: CS06 Test

Test Setup Verified: ______________________________
Signature

3.4.9.3.1 Step 3: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.9.3.2: Susceptibility to Injected Transients on Power Leads

+28V Main Power Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

+28V Analog Telemetry Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper __________ Customer Representative: ______________________

TEST DATA SHEET 6 (Sheet 2 of 2)
3.4.9: CS06 Test (Cont)

+28V Pulse Load Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
8V, Positive	See Figure 9						
13V, Negative	See Figure 9						

+10V Interface Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 7 (Sheet 1 of 2)
3.4.10: RS03 Test

Test Setup Verified: ______________________________
Signature

3.4.10.3.2 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 7 (Sheet 2 of 2)
3.4.10: RS03 Test (Cont)

3.4.10.3.3: Susceptibility to Radiated Electric Fields

Frequency Range	Test Level V/m	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria V/m	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

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30. APPENDIX C EMI DATA COLLECTION

This Appendix contains the EMI data collection process and steps performed during EMI testing.

30.1 *EMI data collection during the susceptibility tests.* EMI data collection during the susceptibility tests will be accomplished by the following data collection steps.

30.2 *Data collection.* Actual data collection will be accomplished as described in the following steps.

1. Start data collection. From the Main menu, select command "[7 } SPECIAL CYCLE CALIBRATION". The CRT screen will go into the TEST INITIALIZATION menu. Select command "[13] SCANS TO ACQUIRE". Enter 24 as the number of scans (for 90 second sweep time).

2. Select command "[16] START DATA ACQUISITION". Coordinate with the EMI equipment operator and start the sweep of the EMI frequency band being tested when the scan count reaches about (6).

3. Stop data collection. Coordinate with the EMI equipment operator such that the data collection process is stopped about (19) scans after the EMI frequency band sweep is complete. At the end of the 24 scans, the screen will change to the AMSU-A1/A2 DELTA T and CALIBRATION ACCURACY menu.

4. Display and print the data collected. Press "[2] PRINT" to print the screen. Press "[1] RETURN". The display will prompt "Do you wish to save data on disk (Y/N)?" Enter N for no.

5. The STE program will return to the AMSU-A1/A2 TEST INITIALIZATION menu. Enter command "[15] SELECT CAL PROCESS" and press the ENTER key. The program will return to the AMSU-A1/A2 CALIBRATION PROCESS SELECTION menu.

6. Print the distribution. Select "[12] PRINT DISTRIBUTION" to obtain the data plot for each sensor channel. Select "[1] RETURN" to return to the AMSU-A1/A2 TEST INITIALIZATION menu.

7. Examine each channel's response (Warm AVE) and evaluate it with the susceptibility criteria to determine if pass or fail test results were obtained. If the data passes, proceed to the next EMI test and if the data fails, repeat the test at reduced frequency range and amplitude level (using the same procedures), to establish the frequency and threshold level of AMSU performance.

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DOCUMENT APPROVAL SHEET

GENCORP AEROJET

TITLE	DOCUMENT NO.
Process Specification Test Procedure, Electromagnetic Interference (EMI)/Electromagnetic Radiation (EMR) and Electromagnetic Compatibility (EMC) for the METSAT/METOP Advanced Microwave Sounding Unit – A (AMUS-A)	AE-26151/5E 11 February 1999

INPUT FROM:	DATE	CDRL:	SPECIFICATION ENGINEER:	DATE
L. Paliwoda		301A	G. Waki	

CHECKED BY:	DATE	JOB NUMBER:	DATE
J. Grime		N/A	

APPROVED SIGNATURES	DEPT. NO.	DATE
Product Team Leader (L. Paliwoda) Larry T. Paliwoda	7888	2/26/99
Technical Director/PMO (P. Patel) P. K. Patel	8311	2/26/99
Released: Configuration Management (J. Cavanaugh) J. Cavanaugh	8361	3/1/99

Approved as Final per customer's letter dated 24February 1999 (ECN CAMSU-2045)

By my signature, I certify the above document has been reviewed by me and concurs with the technical requirements related to my area of responsibility.

(Data Center) FINAL

C. Marks Sunda 3-1-99

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Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
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4. Title and Subtitle Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report	5. Report Date March 2000
	6. Performing Organization Code ---
7. Author(s) R. Maciel	8. Performing Organization Report No. 11648
	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
12. Sponsoring Agency Name and Address NASA Goddard Space Flight Center Greenbelt, Maryland 20771	13. Type of Report and Period Covered Final
	14. Sponsoring Agency Code ---

15. Supplementary Notes

---

16. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, Final Comprehensive Test Report, P/N 1331720-2-TST, S/N 108/A1, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

17. Key Words (Suggested by Author(s))	18. Distribution Statement
EOS Microwave System	Unclassified --- Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of pages	22. Price
Unclassified	Unclassified		---

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5. FUNDING NUMBERS

NAS 5-32314

6. AUTHOR(S)

R. Maciel

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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Azusa, CA 91702

8. PERFORMING ORGANIZATION REPORT NUMBER

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March 2000

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Greenbelt, Maryland 20771

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11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

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13. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, Final Comprehensive Test Report, P/N 1331720-2-TST, S/N 108/A1, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

14. SUBJECT TERMS

EOS
Microwave System

15. NUMBER OF PAGES

16. PRICE CODE

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17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
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Product Team Leader (A. Nieto) A. Nieto			8410	3/17/00
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