



**CALIBRATION LABORATORY**  
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# Sample Calibration Report

Report Number: Sample

**Model:** ATS2  
**Serial Number:** Sample

**Data Type:** AS RECEIVED  
**Date of Cal:** 8-Jul-2007

**Program:**  
 ATS2CAL-apc.atsb 1.04

Option Status	
PERF	Installed
EURZ	Not Installed
600Z	Installed

Main Module Status and Data		
AP Name	Serial No	Revision
RMTS	Sample	0-2

**Explanatory notes to the last three columns of the calibration report**

**"MU"** - The column labeled "MU" lists the expanded measurement uncertainties derived from published specifications of the calibration equipment, resolution factors, and statistical data of repeatability which may include inter-lab comparisons and/or other information. These are based on a coverage factor of 2 (k=2) corresponding to a confidence level of 95%.

**"TUR"** - The column labeled "TUR" lists the test uncertainty ratio calculated by dividing the lesser of the lower and upper reading tolerances by the expanded measurement uncertainty. An entry of "na" indicates [1] the specified limits are one-sided, or [2] the performance characteristic is a self-test or system specification that is not independently certifiable.

**"Result"** - The column labeled "Result" lists color-coded assessments that the observed characteristic is within its specified limits of performance. There are three possible indications:

**pass** -- The READING is within the specified upper and lower limits reduced by guard-bands equal to the expanded measurement uncertainty or "MU". The confidence level is 95% or higher the observed characteristic is within specification.

**pass (<95%)** -- The READING is within the specified upper and lower limits, but it is close to one of the limits by an amount that is less than the expanded measurement uncertainty or "MU". Conformance to specification is more probable than not, however the confidence level may be <95%.

**>> FAIL <<** -- The observed characteristic is out of specification.

This report is valid only when accompanied by a signed Certificate of Calibration.

File name: ATS2Report-apc.xls

File version: REV1.05-25JUN2007-SR

Item	Setting(s)	Lower Limit	READING	Upper Limit	MU	TUR	Result
<b>ANALOG GENERATOR CHARACTERISTICS</b>							
<b>[1] Sine Frequency Accuracy (kHz)</b>							
	5 kHz	4999.9900	4999.999	5000.0100	0.0032	3.1	pass
<b>[2] Sine Amplitude Accuracy at 1 kHz (Volts, mVolts)</b>							
Channel A	8.000 V	7.9200	8.0069	8.0800	0.0049	>10	pass
	5.000 V	4.9500	5.0037	5.0500	0.0031	>10	pass
	2.500 V	2.4750	2.5030	2.5250	0.0015	>10	pass
	1.200 V	1.18800	1.2022	1.21200	0.00077	>10	pass
	300 mV	297.00	301.16	303.00	0.18	>10	pass
	10 mV	9.9000	10.0413	10.1000	0.0061	>10	pass
Channel B	8.000 V	7.9200	7.9981	8.0800	0.0049	>10	pass
	5.000 V	4.9500	5.0028	5.0500	0.0031	>10	pass
	2.500 V	2.4750	2.5011	2.5250	0.0015	>10	pass
	1.200 V	1.18800	1.2011	1.21200	0.00077	>10	pass
	300 mV	297.00	300.76	303.00	0.18	>10	pass
	10 mV	9.9000	10.0299	10.1000	0.0061	>10	pass
<b>[3] Sine Flatness at 5.0 Volts (dB)</b>							
Channel A	10 Hz	-0.1000	0.000	0.0600	0.0019	>10	pass
	20 Hz	-0.0100	0.000	0.0100	0.0019	5.3	pass
	20 kHz	-0.0100	0.001	0.0100	0.0021	4.8	pass
	50 kHz	-0.1000	0.029	0.0600	0.0086	7.0	pass
Channel B	10 Hz	-0.0600	0.000	0.0600	0.0019	>10	pass
	20 Hz	-0.0100	0.000	0.0100	0.0019	5.3	pass
	20 kHz	-0.0100	0.003	0.0100	0.0021	4.8	pass
	50 kHz	-0.1000	-0.015	0.0600	0.0086	7.0	pass
<b>[4] Sine THD+N (dB), 20 kHz Analyzer BW - self-test</b>							
Channel A	20 Hz, 16.0V bal	-999	-104.12	-101.0	2.0	na	pass
	1 kHz, 16.0V bal	-999	-106.06	-101.0	2.0	na	pass
	5 kHz, 16.0V bal	-999	-105.25	-101.0	2.0	na	pass
	20 kHz, 16.0V bal	-999	-109.97	-101.0	2.0	na	pass
	20 Hz, 8.00V unbal	-999	-104.87	-101.0	2.0	na	pass
	1 kHz, 8.00V unbal	-999	-106.64	-101.0	2.0	na	pass
	5 kHz, 8.00V unbal	-999	-105.73	-101.0	2.0	na	pass
	20 kHz, 8.00V unbal	-999	-110.23	-101.0	2.0	na	pass
Channel B	20 Hz, 16.0V bal	-999	-103.02	-101.0	2.0	na	pass
	1 kHz, 16.0V bal	-999	-103.69	-101.0	2.0	na	pass
	5 kHz, 16.0V bal	-999	-103.11	-101.0	2.0	na	pass
	20 kHz, 16.0V bal	-999	-109.20	-101.0	2.0	na	pass
	20 Hz, 8.00V unbal	-999	-103.46	-101.0	2.0	na	pass
	1 kHz, 8.00V unbal	-999	-104.51	-101.0	2.0	na	pass
	5 kHz, 8.00V unbal	-999	-103.58	-101.0	2.0	na	pass
	20 kHz, 8.00V unbal	-999	-109.49	-101.0	2.0	na	pass
<b>[5] Output Crosstalk (dB) - self-test</b>							
Ch B into Ch A	1 kHz	-999	-142.3	-100.0	1.0	na	pass
	20 kHz	-999	-136.4	-100.0	1.0	na	pass
Ch A into Ch B	1 kHz	-999	-139.9	-100.0	1.0	na	pass
	20 kHz	-999	-127.5	-100.0	1.0	na	pass

Item	Setting(s)	Lower Limit	READING	Upper Limit	MU	TUR	Result	
<b>ANALOG GENERATOR, continued</b>								
<b>[6] DC Offset (mV)</b>								
Channel A	8.00 V, unbal	-56.00	-3.0	56.00	0.14	>10	pass	
	1.000V, unbal	-7.000	-0.70	7.000	0.015	>10	pass	
	100mV, unbal	-0.700	-0.07	0.700	0.008	>10	pass	
Channel B	8.00 V, unbal	-56.00	6.2	56.00	0.14	>10	pass	
	1.000V, unbal	-7.000	0.41	7.000	0.015	>10	pass	
	100mV, unbal	-0.700	0.04	0.700	0.008	>10	pass	
<b>[7] Source Resistance Accuracy (Ohms)</b>								
Channel A	40 Ohm Bal	39.000	40.90	41.000	0.040	>10	pass	
	600 Ohm Bal	594.00	600.51	606.00	0.060	>10	pass	
	20 Ohm Unbal	19.000	20.73	21.000	0.010	>10	pass	
	50 Ohm Unbal	49.000	50.74	51.000	0.040	>10	pass	
Channel B	40 Ohm Bal	39.000	40.91	41.000	0.040	>10	pass	
	600 Ohm Bal	594.00	600.12	606.00	0.060	>10	pass	
	20 Ohm Unbal	19.000	20.73	21.000	0.010	>10	pass	
	50 Ohm Unbal	49.000	50.74	51.000	0.040	>10	pass	
<b>ANALOG ANALYZER CHARACTERISTICS</b>								
<b>[8] Input Termination Accuracy (Ohms)</b>								
Channel A	600 Ohms	594.00	601.12	606.00	0.12	>10	pass	
Channel B	600 Ohms	594.00	600.31	606.00	0.12	>10	pass	
<b>[9] Input Common Mode Rejection (dB)</b>								
Channel A	5.6 Vp range, 10Hz	-999	-93.75	-80.0	5.0	na	pass	
	5.6 Vp range, 1kHz	-999	-93.52	-80.0	5.0	na	pass	
	5.6 Vp range, 20kHz	-999	-94.00	-80.0	5.0	na	pass	
	11.2 Vp range, 1kHz	-999	-72.02	-50.0	2.0	na	pass	
	45 Vp range, 1kHz	-999	-77.51	-50.0	2.0	na	pass	
	200 Vp range, 1kHz	-999	-73.81	-50.0	2.0	na	pass	
Channel B	5.6 Vp range, 10Hz	-999	-87.90	-80.0	5.0	na	pass	
	5.6 Vp range, 1kHz	-999	-87.68	-80.0	5.0	na	pass	
	5.6 Vp range, 20kHz	-999	-87.76	-80.0	5.0	na	pass	
	11.2 Vp range, 1kHz	-999	-66.57	-50.0	2.0	na	pass	
	45 Vp range, 1kHz	-999	-60.70	-50.0	2.0	na	pass	
	200 Vp range, 1kHz	-999	-59.31	-50.0	2.0	na	pass	
<b>[10] Level Meter Accuracy at 1 kHz (Volts, mVolts)</b>								
Channel A	120 V	118.80	119.92	121.20	0.12	10.0	pass	
	60 V	59.400	59.968	60.600	0.061	9.8	pass	
	30 V	29.700	29.973	30.300	0.030	10.0	pass	
	16 V	15.840	15.988	16.160	0.016	10.0	pass	
	8 V	7.9200	7.9934	8.0800	0.0081	9.9	pass	
	4 V	3.9600	3.9971	4.0400	0.0041	9.8	pass	
	2 V	1.9800	1.9981	2.0200	0.0020	10.0	pass	
	1 V	0.9900	0.9988	1.0100	0.0010	10.0	pass	
	500 mV	495.00	499.22	505.00	0.51	9.8	pass	
	240 mV	237.60	239.57	242.40	0.24	10.0	pass	
	5 mV	4.9500	4.991	5.0500	0.0051	9.8	pass	
	Channel B	120 V	118.80	119.96	121.20	0.12	10.0	pass
		60 V	59.400	59.975	60.600	0.061	9.8	pass
		30 V	29.700	29.993	30.300	0.030	10.0	pass
16 V		15.840	15.995	16.160	0.016	10.0	pass	
8 V		7.9200	8.0004	8.0800	0.0081	9.9	pass	
4 V		3.9600	3.9996	4.0400	0.0041	9.8	pass	
2 V		1.9800	1.9996	2.0200	0.0020	10.0	pass	
1 V		0.9900	0.9997	1.0100	0.0010	10.0	pass	
500 mV		495.00	499.55	505.00	0.51	9.8	pass	
240 mV		237.60	239.76	242.40	0.24	10.0	pass	
5 mV		4.9500	4.995	5.0500	0.0051	9.8	pass	

Item	Setting(s)	Lower Limit	READING	Upper Limit	MU	TUR	Result
<b>ANALOG ANALYZER, continued</b>							
<b>[11] Level Meter Flatness at 3 Volts (dB)</b>							
Channel A	10 Hz	-0.1000	-0.013	0.1000	0.0026	>10	pass
	20 Hz	-0.0100	0.001	0.0100	0.0026	3.8	pass
	20 kHz	-0.0100	-0.005	0.0100	0.0020	5.0	pass
	50 kHz	-0.1000	-0.008	0.1000	0.0026	>10	pass
	120 kHz	-0.1000	-0.064	0.1000	0.0054	>10	pass
Channel B	10 Hz	-0.1000	-0.012	0.1000	0.0026	>10	pass
	20 Hz	-0.0100	0.002	0.0100	0.0026	3.8	pass
	20 kHz	-0.0100	-0.004	0.0100	0.0020	5.0	pass
	50 kHz	-0.1000	-0.008	0.1000	0.0026	>10	pass
	120 kHz	-0.1000	-0.066	0.1000	0.0054	>10	pass
<b>[12] Input Residual Crosstalk (dB)</b>							
Ch B into Ch A	1 kHz	-999	-166.61	-100.0	1.1	na	pass
	20 kHz	-999	-138.70	-100.0	1.1	na	pass
Ch A into Ch B	1 kHz	-999	-163.26	-100.0	1.1	na	pass
	20 kHz	-999	-149.47	-100.0	1.1	na	pass
<b>[13] Residual Noise (uVolts) - self-test</b>							
Channel A	20 kHz BW	0	1.23	1.60	0.06	na	pass
	A-weighted	0	0.94	1.20	0.06	na	pass
	CCIR-rms	0	1.48	2.00	0.08	na	pass
	CCIR-qpk	0	4.36	6.00	0.30	na	pass
	5 kHz bandpass	0	0.15	0.50	0.02	na	pass
	20 kHz bandpass	0	0.29	1.00	0.03	na	pass
Channel B	20 kHz BW	0	1.39	1.60	0.06	na	pass
	A-weighted	0	1.00	1.20	0.06	na	pass
	CCIR-rms	0	1.49	2.00	0.08	na	pass
	CCIR-qpk	0	4.50	6.00	0.30	na	pass
	5 kHz bandpass	0	0.16	0.50	0.02	na	pass
	20 kHz bandpass	0	0.30	1.00	0.03	na	pass
<b>[14] Residual THD+N at 1 kHz, 20 kHz BW (dB) - self-test</b>							
Channel A	1.00 V	-999	-106.91	-101.0	1.2	na	pass
	300 mV	-999	-103.62	-99.6	1.2	na	pass
	10 mV	-999	-78.50	-75.9	1.2	na	pass
Channel B	1.00 V	-999	-105.93	-101.0	1.2	na	pass
	300 mV	-999	-102.71	-99.6	1.2	na	pass
	10 mV	-999	-77.56	-75.9	1.2	na	pass
<b>[15] FFT Residual Distortion (dB) - self-test</b>							
ChA HighRes	2 kHz	-999	-112.5	-105.0	2.0	na	pass
ChA HighBW	20 kHz	-999	-96.8	-90.0	1.0	na	pass
ChB HighRes	2 kHz	-999	-109.6	-105.0	2.0	na	pass
ChB HighBW	20 kHz	-999	-98.6	-90.0	1.0	na	pass
<b>[16] Residual SMPTE IMD (%) - self-test</b>							
Channel A	16.00 V, bal	0%	0.00162%	0.00250%	0.00050%	na	pass
	1.00 V, bal	0%	0.00139%	0.00250%	0.00050%	na	pass
	200 mV, bal	0%	0.00183%	0.00250%	0.00050%	na	pass
Channel B	16.00 V, bal	0%	0.00137%	0.00250%	0.00050%	na	pass
	1.00 V, bal	0%	0.00152%	0.00250%	0.00050%	na	pass
	200 mV, bal	0%	0.00177%	0.00250%	0.00050%	na	pass
<b>[17] Frequency Measurement Accuracy (µHz/Hz)</b>							
	20 kHz	-2.00	0.17	2.00	0.63	3.2	pass
<b>[18] Phase Measurement Offset (Degrees)</b>							
	10 Hz, dc coupled	-2.000	0.00	2.000	0.004	>10	pass
	10 Hz, ac coupled	-2.000	-0.04	2.000	0.004	>10	pass
	1 kHz	-2.000	0.00	2.000	0.020	>10	pass
	5 kHz	-2.00	-0.03	2.00	0.10	>10	pass
	20 kHz	-3.00	0.07	3.00	0.80	3.8	pass
	50 kHz	-5.00	0.04	5.00	0.80	6.3	pass

Item	Setting(s)	Lower Limit	READING	Upper Limit	MU	TUR	Result
<b>AES/EBU DIGITAL I/O CHARACTERISTICS</b>							
<b>[19] Digital Output Amplitude Accuracy (Volts) - oscilloscope referenced</b>							
<i>Output I, balanced</i>	4.00 Vpp	3.540	4.09	4.460	0.050	na	pass
	800 mVpp	660	823	940	10	na	pass
<i>Output II, balanced</i>	4.00 Vpp	3.540	4.13	4.460	0.050	na	pass
	800 mVpp	660	829	940	10	na	pass
<i>Unbalanced</i>	1.00 Vpp	0.905	1.013	1.095	0.015	na	pass
	200 mVpp	169	205	231	3	na	pass
<b>[20] Input Voltage Measurement Accuracy (Volts) - oscilloscope referenced</b>							
<i>Input I, balanced</i>	4.00 Vpp	3.550	4.064	4.450	0.050	na	pass
	800 mVpp	664	787.1	930	10	na	pass
<i>Input II, balanced</i>	4.00 Vpp	3.550	4.037	4.450	0.050	na	pass
	800 mVpp	670	788.3	930	10	na	pass
<i>Unbalanced</i>	1.00 Vpp	0.905	1.027	1.12	0.015	na	pass
	200 mVpp	168	196.2	232	3	na	pass
<b>[21] Jitter Accuracy at 500 Hz (UI) - self-test</b>							
<i>Avg Detection</i>	2.500 UI	2.238	2.42	2.762	0.060	na	pass
	0.305 UI	0.263	0.30	0.348	0.006	na	pass
<i>Pk Detection</i>	2.500 UI	2.238	2.41	2.762	0.060	na	pass
	0.305 UI	0.263	0.30	0.348	0.006	na	pass
<b>[22] Jitter Flatness at 300 mUI (dB) - self-test</b>							
	100 Hz	-1.00	-0.04	1.00	0.12	na	pass
	200 Hz	-1.00	-0.03	1.00	0.12	na	pass
	1 kHz	-1.00	0.04	1.00	0.12	na	pass
	5 kHz	-1.00	-0.01	1.00	0.12	na	pass
	10 kHz	-1.00	-0.03	1.00	0.12	na	pass
	20 kHz	-1.00	-0.05	1.00	0.12	na	pass
<b>[23] Residual Jitter, Peak detection, 700 Hz to 100 kHz BW (ns) - self-test</b>							
<i>Input signal path I</i>	48k sample rate	0	0.740	2.00	0.40	na	pass
	96k sample rate	0	1.088	2.00	0.40	na	pass
<i>Input signal path II</i>	48k sample rate	0	0.740	2.00	0.40	na	pass
	96k sample rate	0	1.305	2.00	0.40	na	pass

END OF REPORT