TEST REPORT FROM:

COMMUNICATION CERTIFICATION LABORATORY
1940 W. Alexander Street
Salt Lake City, Utah
84119-2039

Type of Report: Certification

TEST OF: RAV 900 & RAV 600 Mixer

FCC ID: FBIRAV

To FCC PART 15, Subpart C
Section 15.249

Test Report Serial No: 73-7990

Applicant:

ClearOne Communications, Inc.
1825 Research Way
Salt Lake City, UT 84119

Date(s) of Test: October 26-27, 2004

Issue Date: November 11, 2004

CERTIFICATION OF ENGINEERING REPORT

This report has been prepared by Communication Certification Laboratory to determine compliance of the device described below with the certification requirements of FCC Part 15, Subpart C Sections 15.249. This report may be reproduced in full, partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

- Applicant: ClearOne Communications, Inc.
- Manufacturer: ClearOne Communications, Inc.
- Trade Name: ClearOne
- Model Number: RAV 900 & RAV 600 Mixer
- FCC ID: FBIRAV

On this 11th day of November 2004, I, individually, and for Communication Certification Laboratory, certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

Although NVLAP has recognized that the Communication Certification Laboratory EMC testing facilities are in good standing, NVLAP does not endorse the product described in this report.

COMMUNICATION CERTIFICATION LABORATORY

Tested by: Jeffrey L. Draney
EMC Technician

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SECTION 1.0 CLIENT INFORMATION

1.1 Client Information:

Company Name: ClearOne Communications, Inc.
1825 Research Way
Salt Lake City, UT 84119

Contact Name: Roger Midgley
Title: Project Manager

1.2 Manufacturer:

Company Name: ClearOne Communications, Inc.
1825 Research Way
Salt Lake City, UT 84119

Contact Name: Roger Midgley
Title: Project Manager

SECTION 2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of EUT:

Trade Name:	ClearOne
Model Name or Number:	RAV 900 & RAV 600 Mixer
Serial Number:	N/A
Options Fitted:	N/A
Country of Manufacture:	USA

2.2 Description of EUT:

The RAV product line is a complete audio conferencing system that fits a broad range of applications. RAV is available in two models, RAV 600 and RAV 900, and is designed for use in medium to large conference rooms. RAV 600 includes an audio mixer with an integrated telephone interface and amplifier, two RAV microphone pods (comprised of three microphones each), two Bose® ceiling (FreeSpace model 16) or wall-mount speakers (model 161), a wireless control unit for dialing functions (902-928 MHz for North America & 868-870 MHz for Europe) and RAV-Ware software. The RAV 900 adds an extra microphone pod to deliver optimal voice pickup in larger rooms. The RAV 600's main board is a short stuffed version of the fully populated RAV 900; therefore, the RAV 900 was tested as representative of both units.

The RAV 900 was tested with 3 different power supplies, a Phihong PSA31U-120, an Edac EA10301, and an Ault PW128RA1203101 power supply. The RAV 900 was also tested with a 5 dbi, and 0 dBi external monopole antenna with a 13 foot coax and a direct connect 900 monopole antenna. The antennas connect to the RAV 900 through a reverse SMA connector. The RAV 900 uses a TI 6901 or a TI 6903 RF chipset to communicate between the controller and the mixer. The TI 6903 chipset produced the highest emissions. All data in this report reflects this configuration.

This report covers the radio portion of the device only. The digital portion of the EUT is covered under a separate Verification report.

2.3 Modification Incorporated/Special Accessories on EUT:

The RAV 900 required a programming change (10 dB attenuation) to the transmitter to reduce the harmonic emissions. This modification will be made on all production units.

Signature: _____

Typed Name: Roger Midgley

Title: Project Manager

SECTION 3.0 TEST SPECIFICATION, METHODS & PROCEDURES

3.1 Test Specification:

Title: FCC PART 15, Subpart C (47 CFR 15).
Section 15.249

Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz and 24.0-24.25 GHz.

Purpose of Test: The tests were performed to demonstrate Initial compliance.

3.2 Methods & Procedures:

3.2.1 § 15.249

(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902 – 902 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

(b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject to the following conditions:

(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.

(2) The frequency tolerance of the carrier signal shall be maintained within [plusmn]0.001% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery-operated equipment, the equipment tests shall be performed using a new battery.

(3) Antenna gain must be at least 33 dBi. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Sec. 15.209, whichever is the lesser attenuation.

(e) As shown in Sec. 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

(f) Parties considering the manufacture, importation, marketing or operation of equipment under this section should also note the requirement in Sec. 15.37(d).

3.2.2 § 15.207/15.107 Conducted Limits

The RAV 900 radio receives power from a Class A digital device and is subject to the requirements of § 15.107(b).

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of emission (MHz)	Conducted limit (dB[mu]V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

(b) For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms LISN. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB[mu]V)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

(c) The limits shown in paragraphs (a) and (b) of this section shall not apply to carrier current systems operating as unintentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 [mu]V within the frequency band 535-1705 kHz, as measured using a 50 [mu]H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in Sec. 15.109(e).

(d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power

lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

3.3 Test Procedure

The testing was performed according to the procedures in ANSI C63.4 (2003). Testing was performed at CCL's anechoic chamber located in Salt Lake City, Utah. This site has been fully described in a report submitted to the FCC, and was accepted in a letter dated March 11, 2002 (Registration Number: 90502).

CCL participates in the National Voluntary Laboratory Accreditation Program (NVLAP) and has been accepted under NVLAP Lab Code:100272-0, which is effective until September 30, 2005.

For radiated emissions testing that is performed at distances closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

SECTION 4.0 OPERATION OF EUT DURING TESTING

4.1 Operating Environment:

Power Supply: 120 VAC, 60 Hz

4.2 Operating Modes:

Each mode of operation was exercised to produce worst-case emissions. The worst-case emissions were with the RAV 900 fully cabled and continuously transmitting an FSK signal. The RAV 900 was tested with a back of the set antenna and two remote antennas (0 dBi, 5 dBi). The 5 dBi remote antenna produced the highest emissions. The report data reflects this configuration.

4.3 EUT Exercise Software:

The serial port of the RAV 900 was connected to a computer for programming. The RAV 900 was programmed to transmit on three channels (1, 4, & 8) using a continuous FSK signal.

SECTION 5.0 SUMMARY OF TEST RESULTS

5.1 FCC PART 15, Subpart C Sections 15.249

5.1.1 Summary of Tests:

Section	Test Performed	Frequency Range (MHz)	Result
15.249 (a)	Radiated Emissions – Transmitting at 902.55 MHz, 913.0 MHz, and 926.7 MHz	30 to 10,000	Complied
15.109	Radiated Emissions – Receiving at 902.55 MHz, 913.0 MHz, and 926.7 MHz	30 to 5,000	Complied
15.207/ 15.107	Line Conducted Emissions (Hot Lead to Ground)	0.45 to 30	Complied
15.207/ 15.107	Line Conducted Emissions (Neutral Lead to Ground)	0.45 to 30	Complied

5.2 Result

In the configuration tested, the EUT complied with the requirements of the specification.

SECTION 6.0 MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

6.1 General Comments:

This section contains the test results only. Details of the test methods used and a list of the test equipment used during the measurements can be found in Appendix 1 of this report.

6.2 Test Results:

6.2.1 Radiated Interference Level Data - (Vertical Polarity)

(Transmitting Channel 1 at 902.55 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
902.55	Quasi-Peak	67.6	23.8	91.4	94.0
1805.1	Peak	62.0	-7.7	54.3	74.0
1805.1	Average	61.4	-7.7	53.7	54.0
2707.6	Peak*	47.1**	-5.2	41.9	54.0
3610.2	Peak*	46.2**	-2.8	43.4	54.0
4512.8	Peak*	43.3**	-0.6	42.7	54.0
5415.3	Peak*	43.8**	1.1	44.9	54.0
6317.9	Peak*	42.7**	1.6	44.3	54.0
7220.4	Peak*	43.8**	3.5	47.3	54.0
8122.9	Peak*	43.8**	5.1	48.9	54.0
9025.5	Peak*	42.8**	5.1	47.9	54.0

Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

6.2.2 Radiated Interference Level Data - (Horizontal Polarity)

(Transmitting Channel 1 at 902.55 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
902.55	Quasi-Peak	61.0	23.8	84.8	94.0
1805.1	Peak*	52.7	-7.7	45.0	54.0
2707.6	Peak*	47.1**	-5.2	41.9	54.0
3610.2	Peak*	46.2**	-2.8	43.4	54.0
4512.8	Peak*	43.3**	-0.6	42.7	54.0
5415.3	Peak*	43.8**	1.1	44.9	54.0
6317.9	Peak*	42.7**	1.6	44.3	54.0
7220.4	Peak*	43.8**	3.5	47.3	54.0
8122.9	Peak*	43.8**	5.1	48.9	54.0
9025.5	Peak*	42.8**	5.1	47.9	54.0

Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

6.2.3 Radiated Interference Level Data - (Vertical Polarity)

(Transmitting Channel 4 at 913.0 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
913.0	Quasi-Peak	68.9	23.8	92.7	94.0
1826.0	Peak*	54.3	-7.7	46.6	54.0
2739.0	Peak*	47.1**	-5.2	41.9	54.0
3652.0	Peak*	46.2**	-2.8	43.4	54.0
4565.0	Peak*	43.3**	-0.6	42.7	54.0
5478.0	Peak*	43.8**	1.1	44.9	54.0
6391.0	Peak*	42.7**	1.6	44.3	54.0
7304.0	Peak*	43.8**	3.5	47.3	54.0
8217.0	Peak*	43.8**	5.1	48.9	54.0
9130.0	Peak*	42.8**	5.1	47.9	54.0

Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

6.2.4 Radiated Interference Level Data - (Horizontal Polarity)

(Transmitting Channel 4 at 913.0 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
913.0	Quasi-Peak	58.0	23.8	81.8	94.0
1826.0	Peak*	56.3	-7.7	48.6	54.0
2739.0	Peak*	47.1**	-5.2	41.9	54.0
3652.0	Peak*	46.2**	-2.8	43.4	54.0
4565.0	Peak*	43.3**	-0.6	42.7	54.0
5478.0	Peak*	43.8**	1.1	44.9	54.0
6391.0	Peak*	42.7**	1.6	44.3	54.0
7304.0	Peak*	43.8**	3.5	47.3	54.0
8217.0	Peak*	43.8**	5.1	48.9	54.0
9130.0	Peak*	42.8**	5.1	47.9	54.0

Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

6.2.5 Radiated Interference Level Data - (Vertical Polarity)

(Transmitting Channel 8 at 926.7 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
926.7	Quasi-Peak	68.6	23.8	92.4	94.0
1853.4	Peak*	58.4	-7.7	50.7	54.0
2780.1	Peak*	47.1**	-5.2	41.9	54.0
3706.8	Peak*	46.2**	-2.8	43.4	54.0
4633.5	Peak*	43.3**	-0.6	42.7	54.0
5560.2	Peak*	43.8**	1.1	44.9	54.0
6486.9	Peak*	42.7**	1.6	44.3	54.0
7413.6	Peak*	43.8**	3.5	47.3	54.0
8340.3	Peak*	43.8**	5.1	48.9	54.0
9267.0	Peak*	42.8**	5.1	47.9	54.0

Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

6.2.6 Radiated Interference Level Data - (Horizontal Polarity)

(Transmitting Channel 8 at 926.7 MHz)

Frequency MHz	Detector	Receiver Reading dBμV	Correction Factor dB	Field Strength dBμV/m	Limit dBμV/m
926.7	Quasi-Peak	57.7	23.8	81.5	94.0
1853.4	Peak*	51.0	-7.7	43.3	54.0
2780.1	Peak*	47.1**	-5.2	41.9	54.0
3706.8	Peak*	46.2**	-2.8	43.4	54.0
4633.5	Peak*	43.3**	-0.6	42.7	54.0
5560.2	Peak*	43.8**	1.1	44.9	54.0
6486.9	Peak*	42.7**	1.6	44.3	54.0
7413.6	Peak*	43.8**	3.5	47.3	54.0
8340.3	Peak*	43.8**	5.1	48.9	54.0
9267.0	Peak*	42.8**	5.1	47.9	54.0

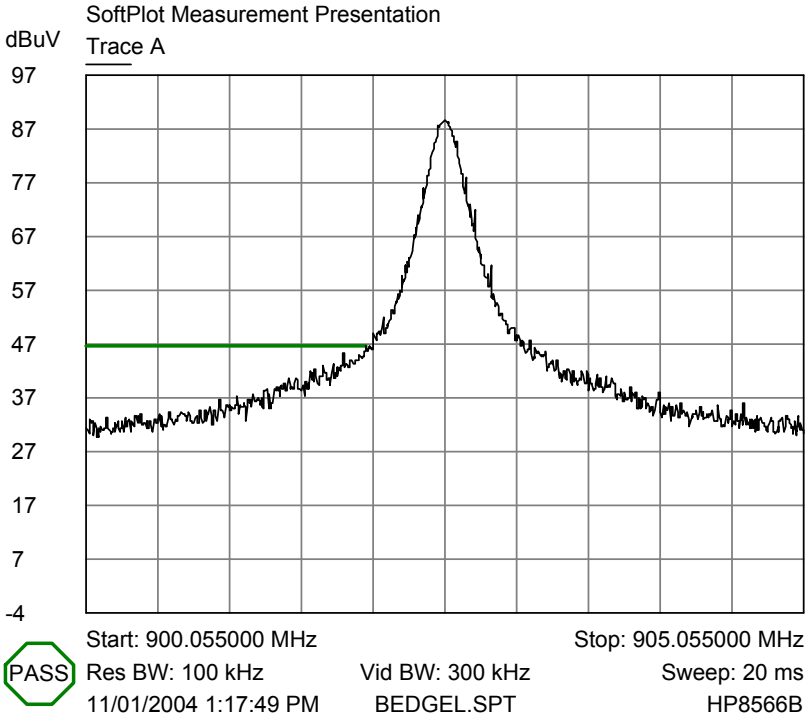
Note 1: * Peak reading compared to average limit

Note 2: ** No emission detected, noise floor reading from spectrum analyzer

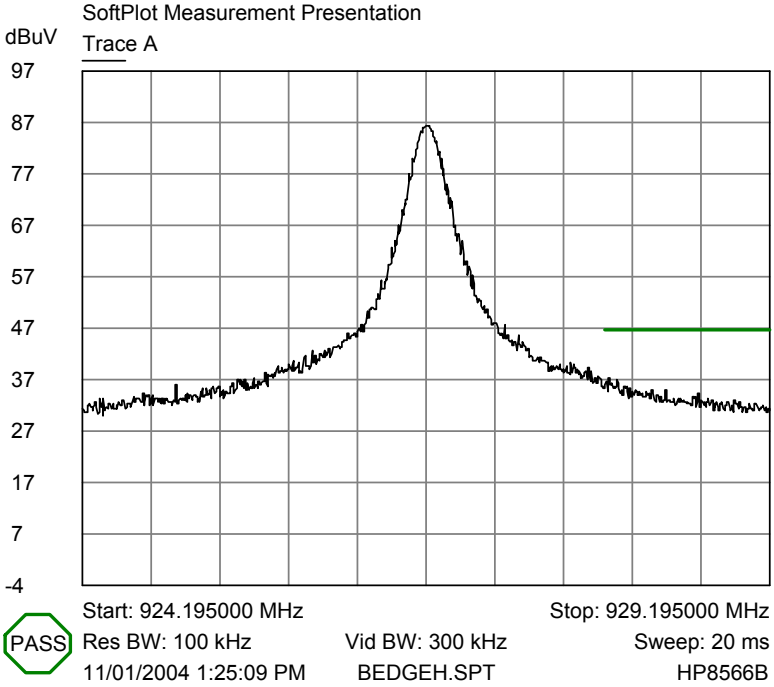
6.2.7 Radiated Interference Level Data (Receiver)

No emissions were detected from the receiver portion of the RAV 900 radio. The emissions were checked from 30 MHz to 5000 MHz. The emissions from the digital portion of the EUT are covered under a separate verification report.

6.2.8 Radiated Band Edge Plots



Base Unit with 6903 Channel 1 low band edge



Base Unit with 6903 Channel 8 high band edge

6.2.9 Conducted Disturbance at Mains Ports Data (Hot Lead)

Frequency (MHz)	Detector	Measured Level (dBμV)	Class A Limit (dBμV)	Margin (dB)
0.19	Peak (Note 1)	56.5	66.0	-9.5
1.46	Peak (Note 1)	46.2	60.0	-13.8
1.52	Peak (Note 1)	46.7	60.0	-13.3
1.59	Peak (Note 1)	46.9	60.0	-13.1
4.51	Peak (Note 1)	46.4	60.0	-13.6
18.10	Peak (Note 1)	50.9	60.0	-9.1
18.95	Peak (Note 1)	52.0	60.0	-8.0
22.05	Peak (Note 1)	52.7	60.0	-7.3
23.00	Peak (Note 1)	51.4	60.0	-8.6
23.70	Peak (Note 1)	51.6	60.0	-8.4

Note 1: The reference detector used for the measurements was Quasi-Peak or Peak and the data was compared to the average limit; therefore, the EUT was deemed to meet both the average and quasi-peak limits.

Note 2: The reference detector used for the measurements was quasi-peak and average and the data was compared to the respective limits.

Measurement Uncertainty

The measurement uncertainty (with a 95% confidence level) for this test was: ± 3.3 dB.

RESULT

The EUT complied with the specification limit by a margin of 7.3 dB.

6.2.10 Conducted Disturbance at Mains Ports Data (Neutral Lead)

Frequency (MHz)	Detector	Measured Level (dBμV)	Class A Limit (dBμV)	Margin (dB)
0.19	Peak (Note 1)	55.6	66.0	-10.4
4.46	Peak (Note 1)	44.2	60.0	-15.8
4.53	Peak (Note 1)	46.1	60.0	-13.9
4.59	Peak (Note 1)	45.1	60.0	-14.9
4.66	Peak (Note 1)	45.9	60.0	-14.1
18.18	Peak (Note 1)	51.8	60.0	-8.2
19.30	Peak (Note 1)	50.9	60.0	-9.1
21.35	Peak (Note 1)	51.6	60.0	-8.4
22.30	Peak (Note 1)	51.6	60.0	-8.4
23.35	Peak (Note 1)	50.7	60.0	-9.3

Note 1: The reference detector used for the measurements was Quasi-Peak or Peak and the data was compared to the average limit; therefore, the EUT was deemed to meet both the average and quasi-peak limits.

Note 2: The reference detector used for the measurements was quasi-peak and average and the data was compared to the respective limits.

Measurement Uncertainty

The measurement uncertainty (with a 95% confidence level) for this test was: ± 3.3 dB.

RESULT

The EUT complied with the specification limit by a margin of 8.2 dB.

6.3 Sample Field Strength Calculation:

The field strength is calculated by adding the Correction Factor (Antenna Factor + Cable Factor), to the measured level from the receiver. The receiver amplitude reading is compensated for any amplifier gain. The basic equation with a sample calculation is shown below:

FS = RA + CF Where

FS = Field Strength
RA = Receiver Amplitude Reading
CF = Correction Factor (Antenna Factor + Cable Factor – Amplifier Gain)

Assume a receiver reading of 42.5 dBμV is obtained from the receiver, an amplifier gain of 26.5 dB and a correction factor of 8.5 dB. The field strength is calculated by subtracting the amplifier gain and adding the correction factor, giving a field strength of 24.5 dBμV/m, FS = (42.5 - 26.5) + 8.5 = 24.5 dBμV/m

APPENDIX A TEST PROCEDURES AND TEST EQUIPMENT

Radiated Interference Emissions:

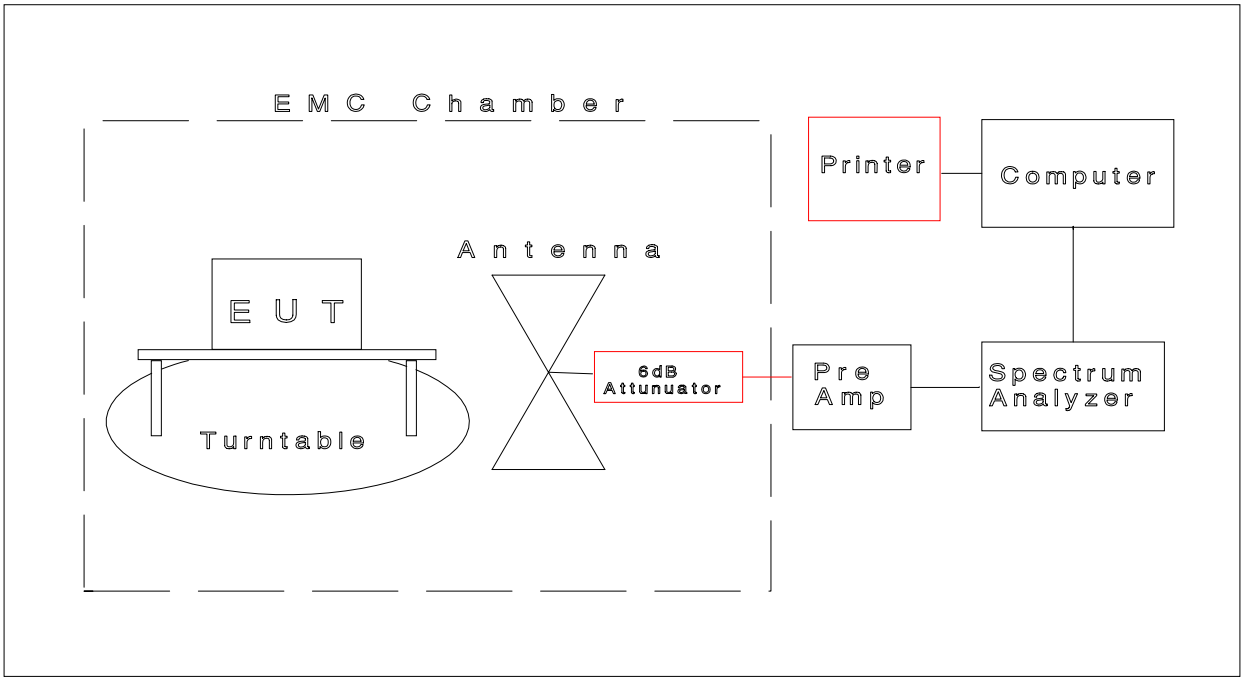
The radiated emission from the intentional radiator was measured using a spectrum analyzer with a quasi-peak adapter for peak and quasi-peak readings. A preamplifier with a fixed gain of 26 dB and a power amplifier with a fixed gain of 22 dB were used to increase the sensitivity of the measuring instrumentation. The quasi-peak adapter uses a bandwidth of 120 kHz, with the spectrum analyzer's resolution bandwidth set at 1 MHz, for readings in the 30 to 1000 MHz frequency range. For peak emissions above 1000 MHz the spectrum analyzer’s resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3 MHz. For average emissions above 1000 MHz the spectrum analyzer’s resolution bandwidth was set to 1 MHz and the video bandwidth was set to 10 Hz.

A biconilog antenna was used to measure the frequency range of 30 to 1000 MHz and a Double Ridge Guide Horn antenna was used to measure the frequency range 1 GHz to 10 GHz, at a distance of 3 meters from the EUT. The readings obtained by these antennas are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration
Anechoic Chamber Test Site #2	CCL	N/A	N/A	12/23/2003
Test Software	CCL	Radiated Emissions	Revision 1.3	N/A
Spectrum Analyzer	Hewlett Packard	8566B	2230A01711	12/08/2003
Quasi-Peak Detector	Hewlett Packard	8565A	3107A01582	12/08/2003
Biconilog Antenna	EMCO	3141	1045	12/26/2003
Double Ridged Guide Antenna	EMCO	3115	9409-4355	7/02/2003
3 Meter Radiated Emissions Cable Anechoic Chamber	CCL	Cable B	N/A	01/28/2004
Pre-Amplifier	Hewlett Packard	8447D	1937A03151	04/22/2004
Power-Amplifier	Hewlett Packard	8447E	2434A01975	04/22/2004
6 dB Attenuator	Hewlett Packard	8491A	32835	04/01/2004

An independent calibration laboratory or CCL personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Radiated Emissions Test



Conducted Disturbance at Mains Ports:

The conducted disturbance at mains ports from the intentional radiator was measured using a spectrum analyzer with a quasi-peak adapter for peak, quasi-peak and average readings. The quasi-peak adapter uses a bandwidth of 9 kHz, with the spectrum analyzer's resolution bandwidth set at 100 kHz, for readings in the 450 kHz to 30 MHz frequency ranges.

The conducted disturbance at mains ports measurements are performed in a screen room using a (50 Ω/50 μH) Line Impedance Stabilization Network (LISN).

Where mains flexible power cords are longer than 1 m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

Where the EUT is a collection of intentional radiator with each intentional radiator having its own power cord, the point of connection for the LISN is determined from the following rules:

a) Each power cord, which is terminated in a mains supply plug, shall be tested separately.

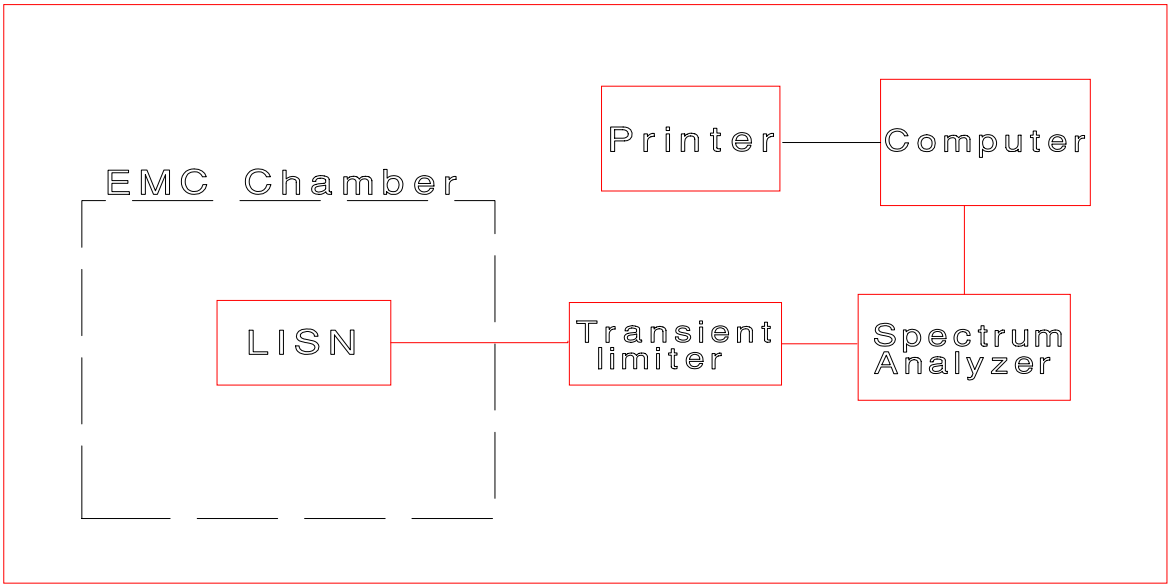
b) Power cords, which are not specified by the manufacturer to be connected via a host unit, shall be tested separately.
c) Power cords which are specified by the manufacturer to be connected via a host unit or other power supplying equipment shall be connected to that host unit and the power cords of that host unit connected to the LISN and tested.
d) Where a special connection is specified, the necessary hardware to effect the connection is supplied by the manufacturer for the testing purpose.
e) When testing equipment with multiple mains cords, those cords not under test are connected to an artificial mains network (AMN) different than the AMN used for the mains cord under test.

Desktop intentional radiators are placed on a non-conducting table at least 0.8 meters from the metallic floor. The equipment is placed a minimum of 40 cm from all walls. Floor standing equipment is placed directly on the earth grounded floor.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration
Wanship Open Area Test Site #2	CCL	N/A	N/A	12/27/2003
Test Software	CCL	Conducted Emissions	Revision 1.2	N/A
Spectrum Analyzer	Hewlett Packard	8566B	2230A01711	10/11/2004
Quasi-Peak Detector	Hewlett Packard	85650A	3107A01582	10/11/2004
LISN	EMCO	3825/2	9305-2099	02/03/2004
Conductance Cable Wanship Site #2	CCL	Cable J	N/A	12/09/2003
Transient Limiter	Hewlett Packard	11947A	3107A02266	12/08/2003

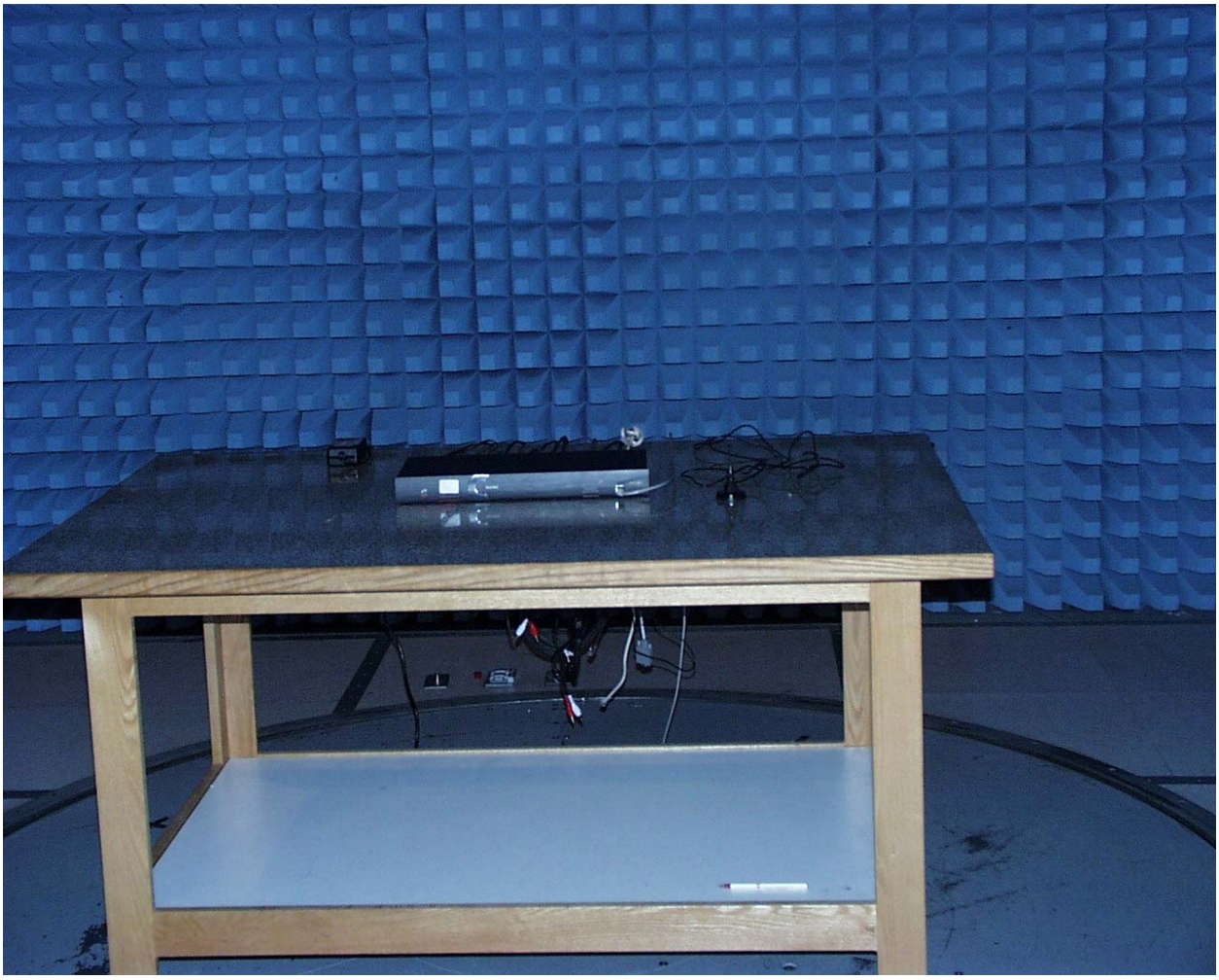
An independent calibration laboratory or CCL personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Line Conducted Emissions Test

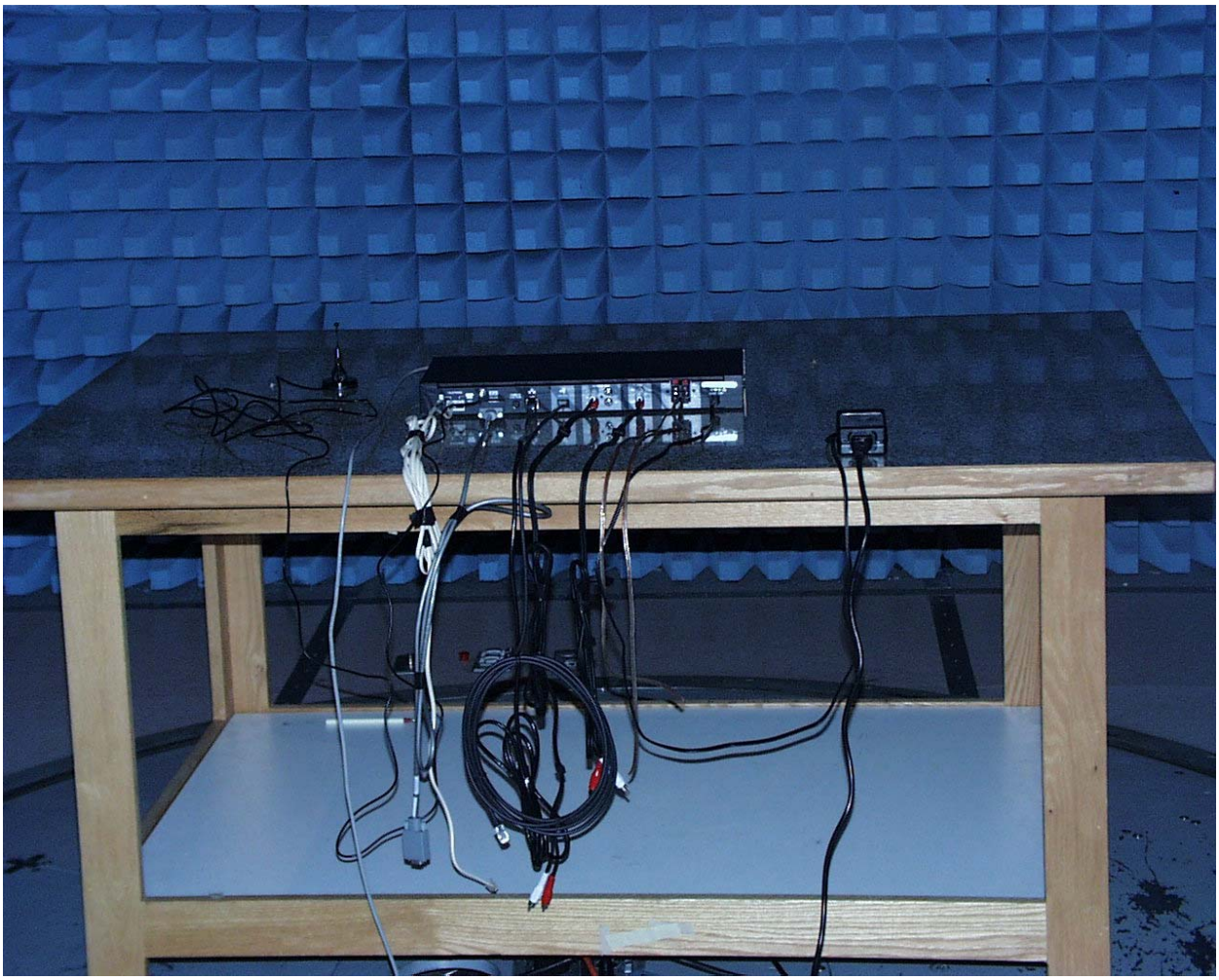


APPENDIX B PHOTOGRAPHS:

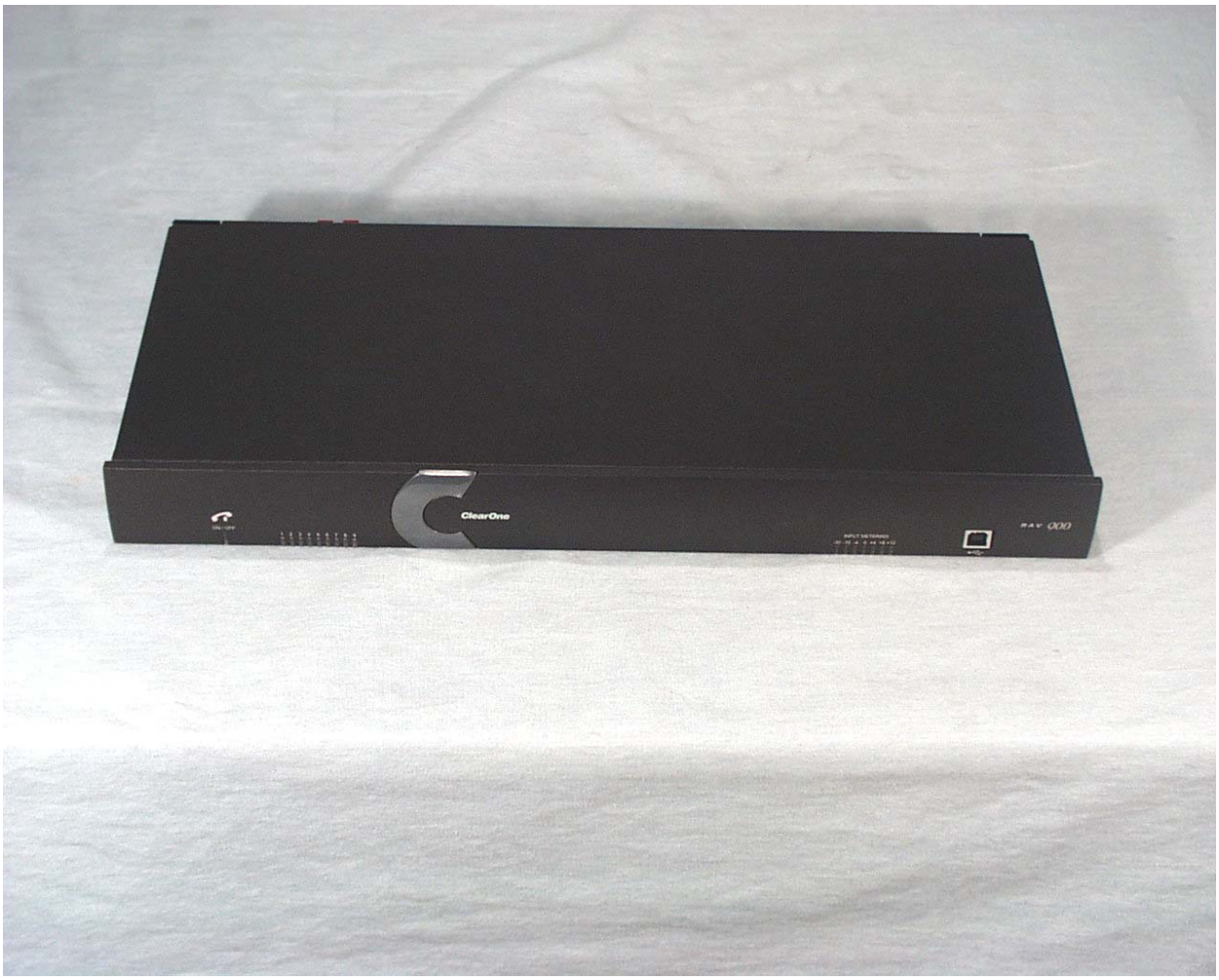
Front view of the Radiated Emissions Test Setup



Back view of the Radiated Emissions Test Setup

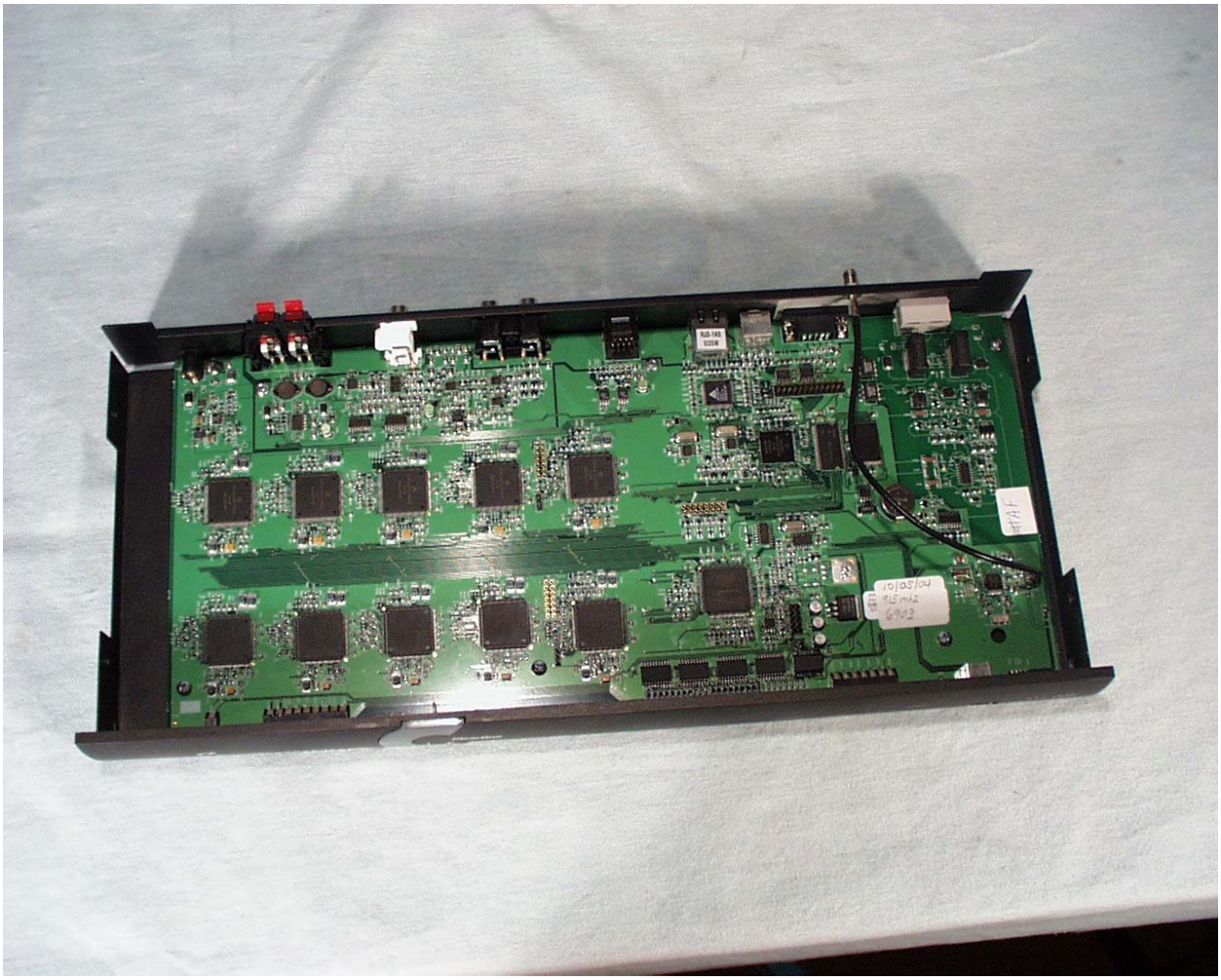


Front View of the EUT

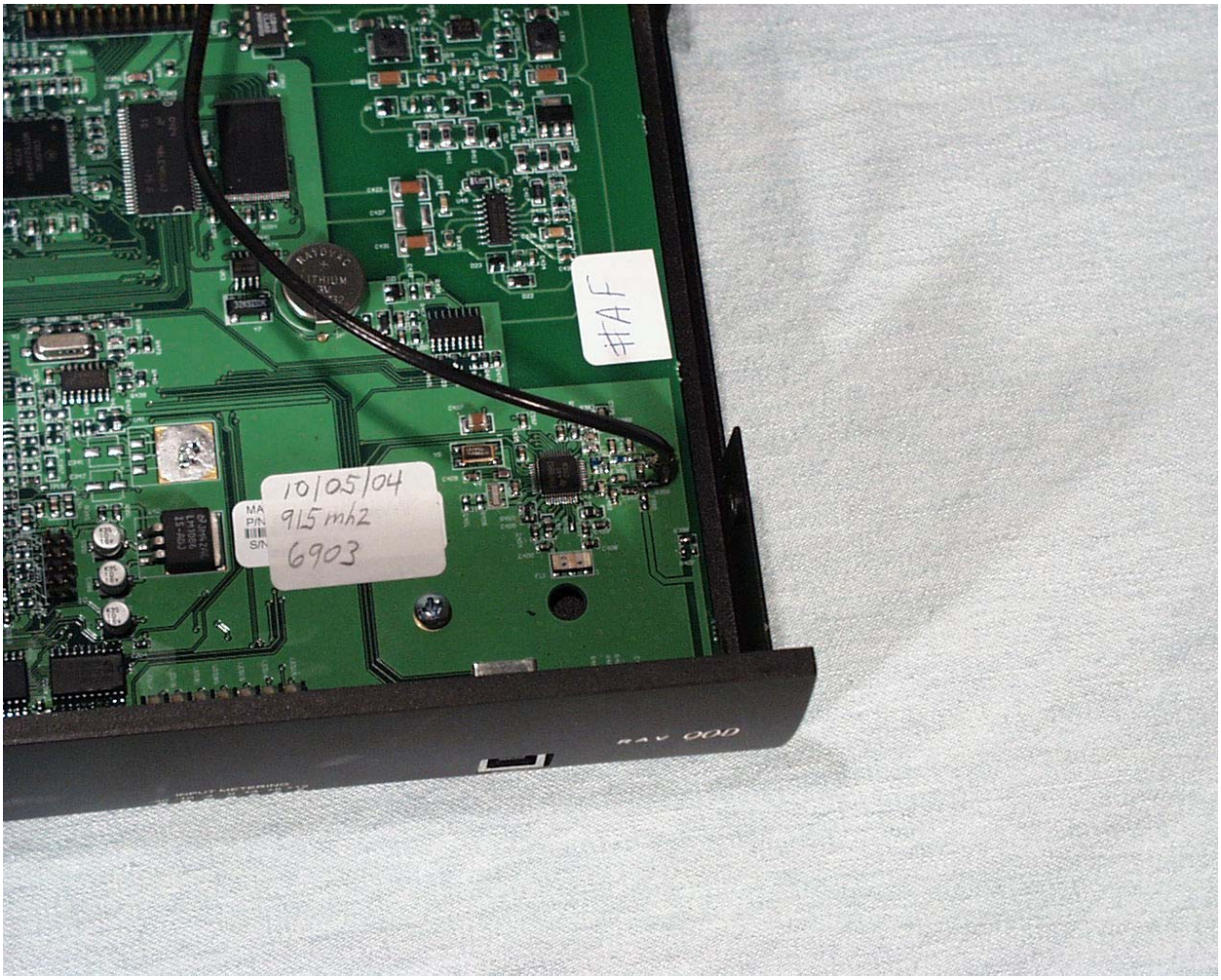


Back View of the EUT

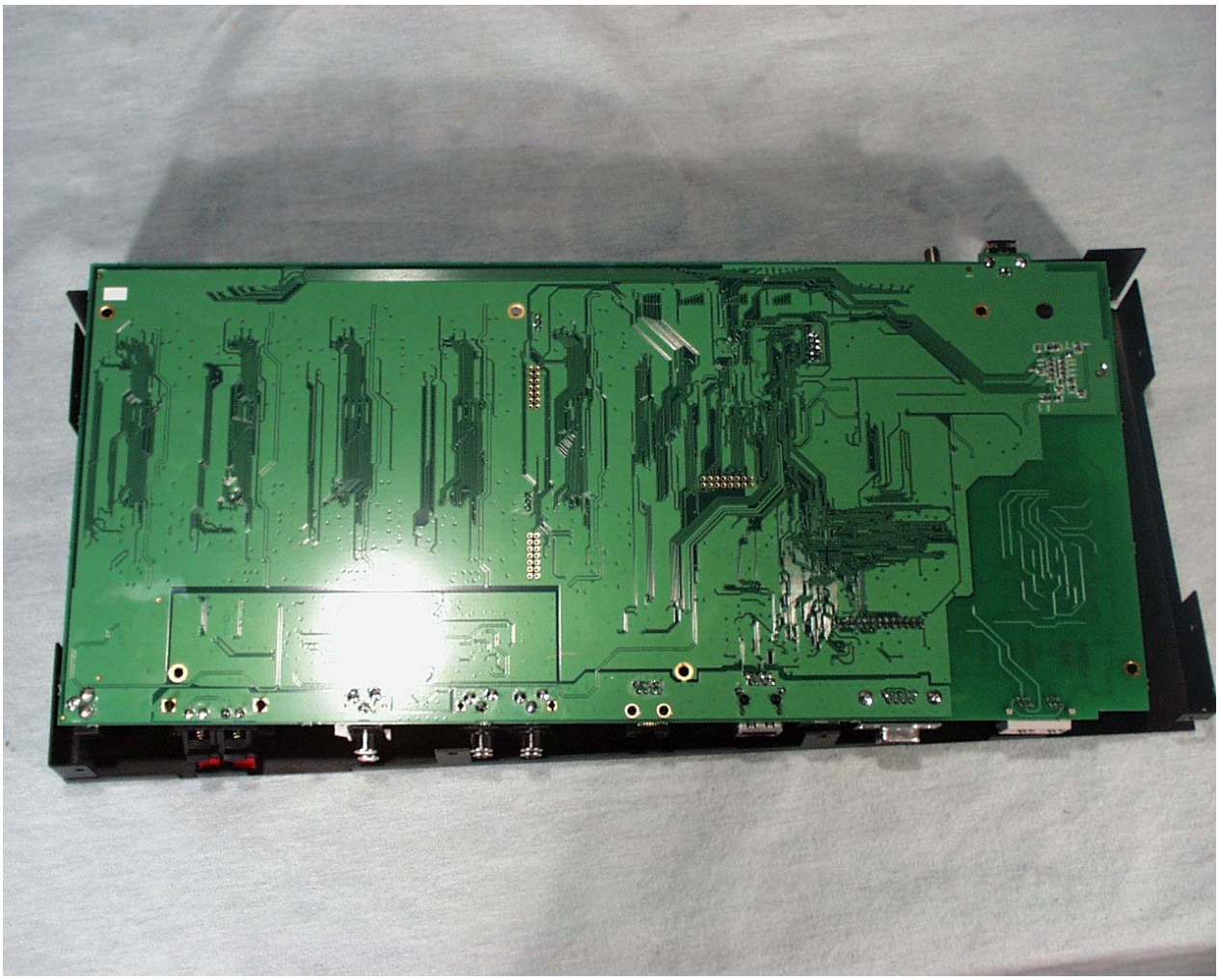
Inside View of the EUT



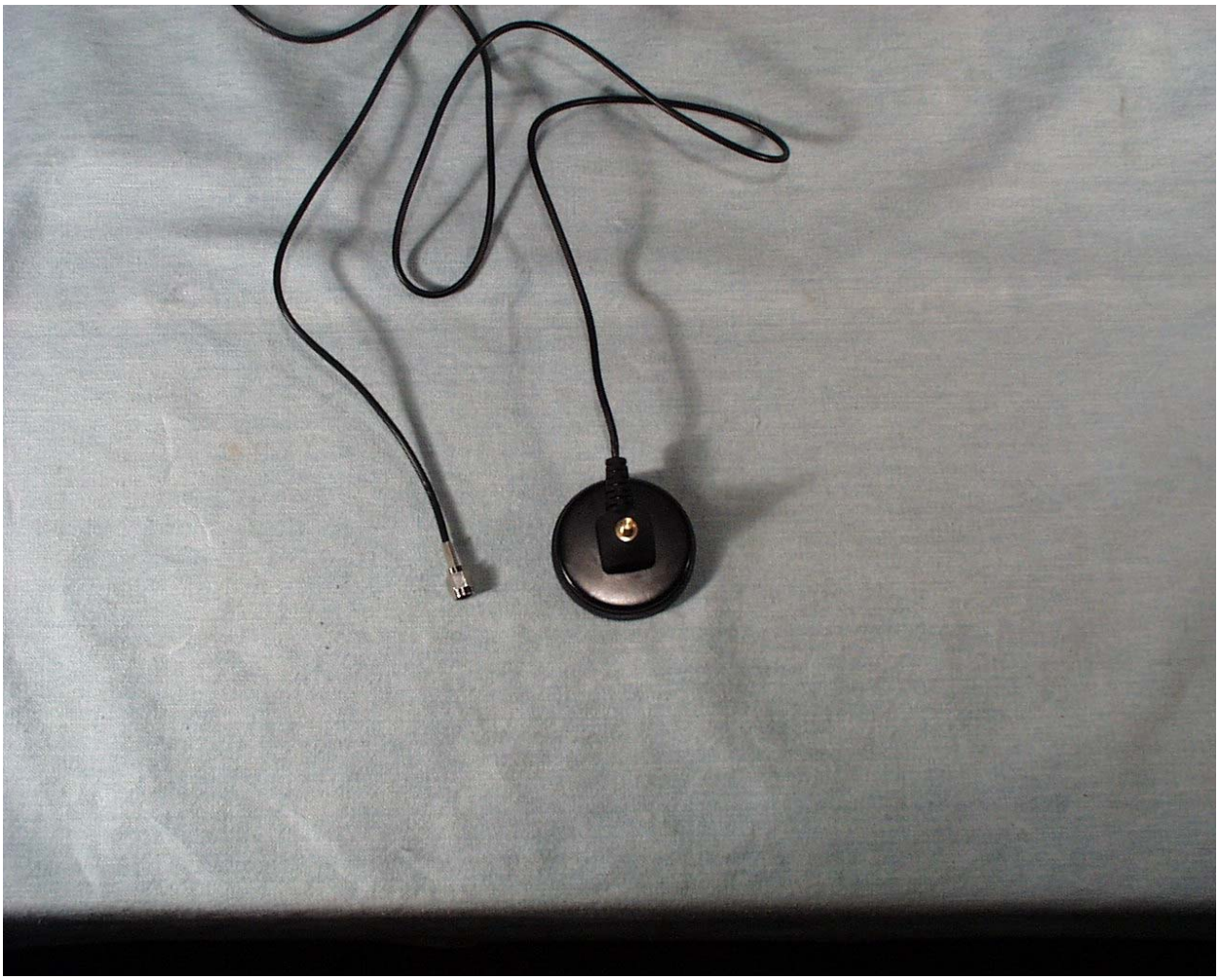
RF Section of the EUT



Trace Side of the EUT PC Board



Remote Antenna Base



Back of Set Antenna

O dBi Remote Antenna

5 dBi Remote Antenna