Lab Code: 200167-0

FCC PART 15C

TEST AND MEASUREMENT REPORT

For

The Q-Track Corporation

3414 Governors Drive SW, Suite Q,

Huntsville, AL 35805, USA

FCC ID: VJ3-QT-600-TAG

Report Type: Original Report	**Product Type:** AM Transmitter
Test Engineers:	Quinn Jiang
Report Number:	R1108103-15C
Report Date:	2011-09-20
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1108103-15C	Initial Report	2011-09-20

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *The Q-Track Corporation* and their product, *model: QT-600, FCC ID: VJ3-QT-600-TAG*, which will henceforth be referred to as the EUT "Equipment Under Test". The EUT is an AM broadcast transceiver that operates from 600 to 1600 kHz. The EUT is microprocessor controlled and powered by a rechargeable lithium ion battery and cannot transmit while it's being charged

1.2 Mechanical Description of EUT

The EUT measures approximately 9cm (L) x 5.8 cm (W) x 2.3 cm (H) and weigh: 69g.

The test data gathered are from sample provided by the manufacturer. Serial number: 3T4SK0.

1.3 Objective

This report is prepared on behalf of *Q-Track Corporation* in accordance with Part 15, Subpart C of the Federal Communication Commissions rules – Causing Equipment Standards for Digital Apparatus.

1.4 Related Submittal(s)/Grant(s)

No Related Submittals.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All tests were performed at Bay Area Compliance Laboratories Corp.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are: spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values range from +2.0 for Conducted Emissions tests and +4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: R-2463 and C-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2001670.htm

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in an operating mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

N/A

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

No special equipment was used during testing.

2.5 Local Support Equipment

Manufacturers	Descriptions	Models	Serial Numbers
-	-	-	-

2.6 EUT Internal Configuration Details

Manufacturers	Descriptions	Models	Serial Numbers
The Q-Track Corporation	Main PCB Board	QT-600 Tag Rev. E	-

2.7 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Emerson Network Power	AC/DC Power Adapter	DCH3-05OUS-0002	BIO1J2

2.8 External I/O Cabling List and Details

Cable Descriptions	Length (m)	From	To
-	-	-	-

3 Summary of Test Results

FCC Rules	Descriptions of Test	Result (s)
§15.207	AC Line Conducted Emissions	N/A
§15.209	Radiated Spurious Emissions	Compliance

Note: N/A, The EUT is battery powered during operating mode, conducted emissions is not required.

4 FCC §15.207 – AC Line Conducted Emissions

4.1 Applicable Standards

As per FCC §15.207: Conducted Limits

As per FCC Section 15.207, For an intentional radiator 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 µH/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 boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

Note 1: The lower limit shall apply at the transition frequency.
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

4.2 Summary of Test Results

N/A, the EUT is battery powered when it is on operating mode.

5 FCC §15.209 – Radiated Emissions

5.1 Applicable Standard

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

5.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

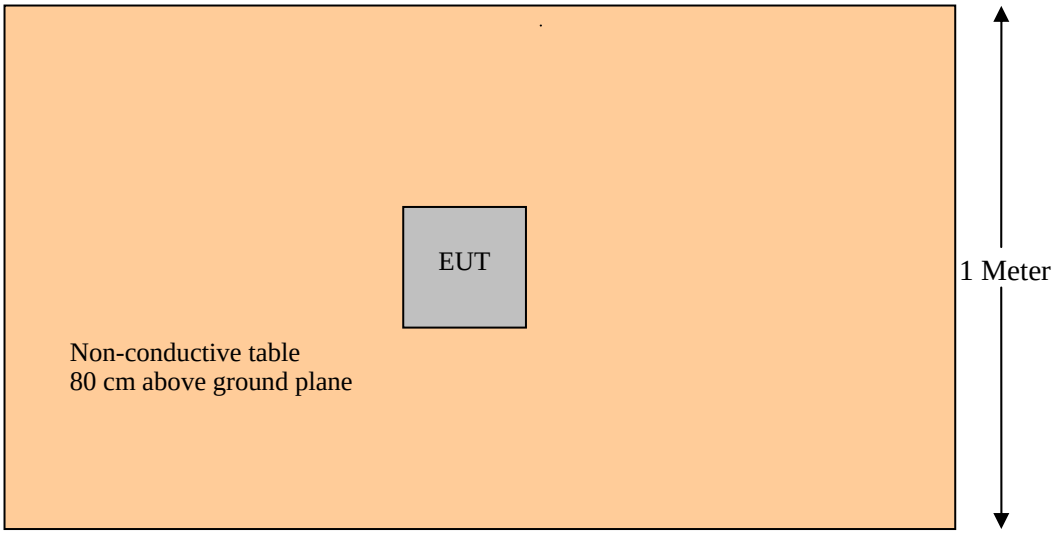
5.3 Test Procedure

For the radiated emissions test, the EUT host was battery powered.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

5.4 Test Setup Block Diagram



5.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

5.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2011-06-18
Sunol Science Corp	Combination Antenna	JB1	A020106-1	2011-05-17
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2011-03-21
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Com-Power	Active Loop Antenna	AL-130	17043	2010-06-01[1]

1) Note: Based on a two year calibration cycle

Statement of Traceability: BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Note: The calibration cycle for Loop Antenna, model AL-130 is 2 years.

5.7 Test Environmental Conditions

Temperature:	25 °C
Relative Humidity:	44 %
ATM Pressure:	101.2kPa

The testing was performed by Quinn Jiang on 2011-08-19 in 5 meter chamber 3.

5.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Subpart C, section 15.209 standard's radiated emissions limits, and had the worst margin of:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range**
-26.95	31.22975	Horizontal	9 kHz – 1000 MHz

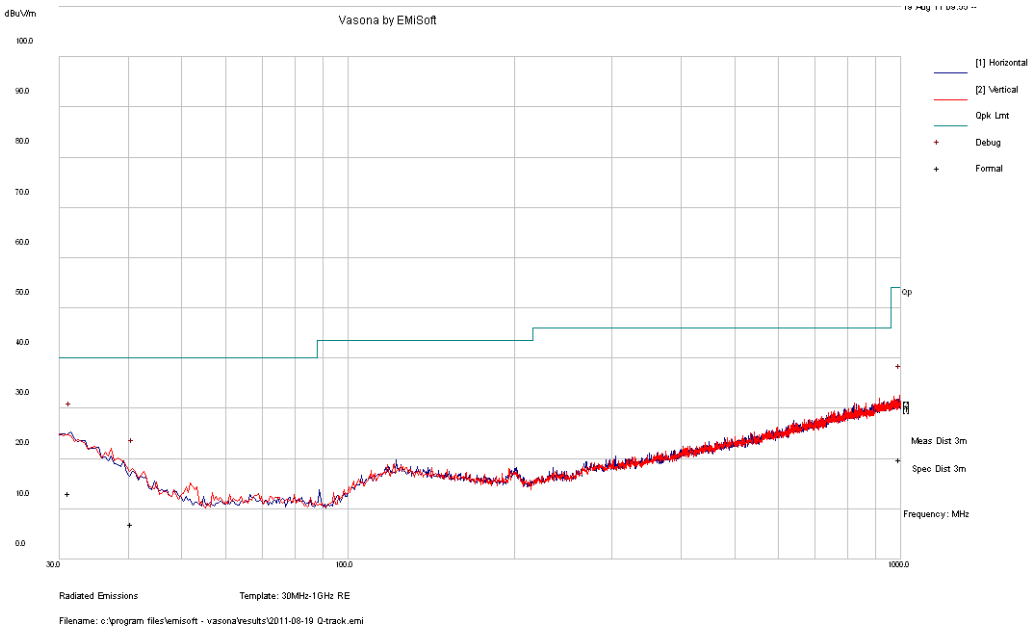
5.9 Radiated Emissions Test Result Data

1) Radiated Emission at 3 meters, 9 kHz – 30 MHz

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	Part 15.209	
			Height (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
0.594	31.51	357	1.0	H	10.5	0.1	0	42.11	72.13	-30.02
0.594	30.18	70	1.0	V	10.5	0.1	0	40.78	72.13	-31.35
1.055	52.51	25	1.0	H	10.7	0.1	0	63.31	67.14	-3.83
1.055	49.33	15	1.0	V	10.7	0.1	0	60.13	67.14	-7.01
2.1096	29.42	99	1.0	H	10.8	0.1	0	40.32	69.54	-29.22
2.1096	25.62	13	1.0	V	10.8	0.1	0	36.52	69.54	-33.02
3.1656	25.03	71	1.0	H	11	0.1	0	36.13	69.54	-33.41
3.1656	20.18	356	1.0	V	11	0.1	0	31.28	69.54	-38.26

Note: 1.055 MHz is the fundamental frequency

2) Radiated Emission at 3 meters, 30 MHz – 1000 MHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
31.22975	13.05	348	H	85	40	-26.95
995.8795	19.82	225	V	349	54	-34.18
40.5865	6.96	388	V	285	40	-33.04