CFR Title 47 Part 15.209
Class II Permissive Change to Application
FCC ID# LQC289

EMI TEST REPORT

on

Q-Tron LTD.
Q-Tron Excitation System

Prepared for

Q-Tron LTD.
3855 64th Avenue SE
Calgary, AB T2C 2V5
Tel: (403) 279-0205
Fax: (403) 236-2555

Prepared by

Electronic Compliance Laboratories Inc.
1249 Birchwood Dr.
Sunnyvale, CA 94089
Tel: (408) 747-1490
Fax: (408) 747-1495

Test Report Number: P806016

Date of Test: June 11 and 15, 1998

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1.0 Verification of Compliance

Purpose of Test: To validate compliance on the Q-Tron Excitation System

Description: Control System for Locomotive.

Model Number: QES 1000

Serial Number: N/A

Applicant: Q-Tron LTD.

Type of Test: CFR 47 Part 15.209 Class A; Class II Permissive Change
Addendum to Application for FCC ID# LQC289

Date of Test: June 11 and 15, 1998

Tested By: Donnie Brooks

The above equipment was tested by Electronic Compliance Laboratories, Inc. and found to be in compliance with the requirements set forth in the FCC Rules and Regulations, Part 15, Subpart B. The equipment, Test in the configuration described in this report, shows that the maximum emission levels emanating from this equipment are within the compliance requirements.

_____ Date:_____
Chris Byleckie
Technical Director

2.0 General Information

Applicant:	Q-Tron LTD. 3855 64th Avenue SE Calgary AB T2C 2V5
Contact Person:	Ed Hildebrandt
Equipment Under Test:	Q-Tron Excitation System
Model Number:	QES 1000
FCC ID No:	LQC289
Report Number:	P806016
Date of Test:	June 11 and 15, 1998
Manufacturer:	Q-Tron LTD.
Type of Test:	FCC part 15, Subpart C, 15.209; Class II Permissive Change Addendum to Application for FCC ID# LQC289
Frequency Range:	30MHz to 1000 MHz

3.0 Test Facility

Name: Electronic Compliance Laboratories

Location: 1249 Birchwood Drive
Sunnyvale, CA 94089

Site Filing: A site description is on file at the Federal Communications Commission
P.O. Box 429
Columbia, MD 21045

Types of Sites: Open Field Radiated and Indoor (Screen Room).
Line Conducted: All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements.
Test facility is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations.

NVLAP Code: 20089 effective through: March 31, 1999

4.0 Test Equipment

The following list contains equipment used at EC Laboratories, Inc. for compliance testing. The equipment conforms to the American National Standard Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1000 MHz.

Description	Manufacturer	S/N	Model No.	Cal. Due Date
EMI Receiver	HP	3325A00137	8456A	5/3/99
Pre-amp	HP	313A06829	8447F	5/10/99
Biconical Antenna	EM	677	EM-6912	3/3/99
Log-Periodic Antenna	EM	858	EM-6950	4/18/99

HP = Hewlett Packard
EM = Electro Metrics

The antenna used at the time the data was taken is indicated on each data page. The antenna height and polarization are also noted on the data pages.

The calibration of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

5.0 Data Reporting Format

The measurement results are expressed in accordance with FCC Part-15, Subpart C; Class B limits, where applicable, are presented in tabular or graphical form.

6.0 Detector Functions

On any frequency or frequencies below or equal to 1000 MHz, the limits shown below are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths.

On any frequency or frequencies above 1000 MHz, the radiated limits shown below are based on the use of measuring equipment employing an average detector function.

EC Laboratories uses the Peak detection mode for normal testing and initial screening of the EUT. The Peak detection mode will produce a measurement value that is always greater than, or equal to, the quasi-peak or average detection mode. Whenever the measurement value is 6 dB below the applicable limit or greater, the appropriate detector function will be employed and recorded.

7.0 Frequency Range of Investigation

The spectrum was investigated up to the frequency specified in the following table according to the highest clock frequency generated in the device.

Highest Frequency Used (Clock)	Upper Limit of Range Measured
Below 1.705 MHz	30 MHz
1.705 to 108 MHz	1000 MHz
108 to 500 MHz	2000 MHz
500 to 1000 MHz	5000 MHz
Above 1000 MHz	5th Harmonic or 40 GHz (Whichever is Lower)

8.0 Summary of Measurements

Summary of Measurements

CFR Title 47, Part 15.209

Manufacturer: Q-Tron LTD.
3855 64th Avenue SE
Calgary AB T2C 2V5

Contact: Ed Hildebrandt

FCC ID: LQC289

Test Report Number: P806016

Pass/Fail: Passed

15.209 Radiated Emission Test:

The DUT was placed on a 10 meter open field test site. The highest emission observed was **-9.0 dB** below the applicable limit. All emissions observed were below the FCC Class B limit.

APPENDIX A
Radiated Emissions Data

Electronic Compliance Laboratories, Inc.
1249 Birchwood Ave.
Sunnyvale, CA
Radiated Emissions
Frequency range: 30MHz-1000MHz
3 Meter Open Site
Site Calibrated: June 1997
Government Agency and Limit: FCC Class A

QP = Quasi-Peak Note: Ignore peak readings when Quasi-Peak reading exists
PK = Peak

Customer: QTRON Operator: DONNIE
Date: 06-15-1998 Time: 16:24:03
Temperature Range: 75 Deg F Percent Humidity: 45
E.U.T.: QES 1000
Serial Number:
Support Devices: TWINHEAD LAPTOP,KIKUSUI POWER SUPPLY
Serial Number:
FCC ID:
Exercise Program:
Modifications: None
Report File Name: F:\TESTDATA\8060501.RF

Antenna Type: BICONICAL

TEST FREQ	TEST dBuV	ACTUAL dBuV/m	CLASS A LIMIT	VERSUS A LIMIT	TABLE DEGREES	ANTENNA HEIGHT	POLAR-IZATION	DETECTOR Type
48.000	47.2	34.1	49.0	-14.9	135	2.0	H	PK
110.592	44.2	32.2	53.5	-21.3	0	1.5	H	PK
143.770	48.4	38.8	53.5	-14.7	180	1.5	H	PK
143.996	52.8	43.2	53.5	-10.3	270	2.0	H	PK
165.888	41.6	32.7	53.5	-20.8	45	1.3	H	PK
168.000	47.4	38.5	53.5	-15.0	135	1.8	H	PK
287.509	41.6	37.5	56.4	-18.9	225	2.0	H	PK
264.000	48.2	41.3	56.4	-15.1	225	1.0	H	PK
251.920	33.3	25.9	56.4	-30.5	45	1.0	H	PK
48.000	47.8	34.7	49.0	-14.3	45	1.5	V	PK
60.000	47.6	31.1	49.0	-17.9	270	1.3	V	PK
143.996	58.6	49.0	53.5	-4.5	0	1.0	V	PK
143.996	54.1	44.5	53.5	-9.0	0	1.0	V	QP
167.995	45.0	36.1	53.5	-17.4	290	1.0	V	PK
180.000	41.4	32.7	53.5	-20.8	90	1.0	V	PK
192.000	48.8	40.4	53.5	-13.1	45	2.0	V	PK
251.898	37.0	29.6	56.4	-26.8	135	1.0	V	PK
264.000	39.2	32.3	56.4	-24.1	90	1.0	V	PK

TEST FREQ	TEST dBuV	ACTUAL dBuV/m	CLASS A LIMIT	VERSUS A LIMIT	TABLE DEGREES	ANTENNA HEIGHT	POLAR-IZATION	DETECTOR Type
			CHANGED ANTENNA TO LOG PERIODIC					
312.000	48.1	39.1	56.4	-17.3	300	1.0	V	PK
324.000	40.0	30.7	56.4	-25.7	315	1.3	V	PK
336.000	48.4	39.4	56.4	-17.0	315	1.3	V	PK
432.000	45.7	38.6	56.4	-17.8	300	1.0	V	PK
552.000	39.5	34.9	56.4	-21.5	0	1.0	V	PK
564.000	39.1	34.8	56.4	-21.6	0	1.0	V	PK
324.000	42.0	32.7	56.4	-23.7	200	1.0	H	PK
432.000	40.3	33.2	56.4	-23.2	180	1.0	H	PK
552.000	35.4	30.8	56.4	-25.6	210	1.0	H	PK

APPENDIX B
Support Equipment

Equipment Type:	Laptop
Model Number:	Slimnote-6
Serial Number:	F0115993
FCC ID Number:	FKGP66
Manufacturer:	Twinhead

Equipment Type:	Power Supply
Model Number:	PCR 2000L
Serial Number:	BF001689
Manufacturer:	Kikusui

APPENDIX C

Set-up Photographs

15.209 Radiated Emissions

APPENDIX D

SCHEMATICS