TEST REPORT

Report Number: 3068641.011
Project Number: 3068641
December 21, 2004

Evaluation of the T3 Remote Control Transmitter

FCC ID: MMURTI0300

For
Remote Technologies

Test Performed by:	Test Authorized by:
Intertek	Remote Technologies
7250 Hudson Blvd. Suite 100	18681 Lake Drive East
Oakdale, MN 55128	Chanhassen, MN 55317

Prepared by: _____ Date: December 21, 2004
Uri Spector

Approved by: _____ Date: December 21, 2004
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1.0 GENERAL DESCRIPTION

1.1 Related Submittals Grants

This is single application of the *Remote Technologies T3 Remote Control Transmitter* for Certification under FCC Part 15, Subpart C.
There are no other simultaneous applications.
The Receiver portion will be verified under Declaration of Conformity.

1.2 Product Description

T3 Remote Control Transmitter is a RF remote control operating in 433.84MHz. The intended use of the *T3 Remote Control Transmitter* is to generate and transmit a RF signal to control home entertainment systems. The *T3 Remote Control Transmitter* powered at 4VDC from Lithium internal rechargeable battery.

Antenna Description:

Integrated antenna

Sample Submitted: December 10, 2004
Test Work Started: December 10, 2004
Test Work Completed: September 20, 2004

1.3 Test Methodology

Emission measurements were performed according to the procedures in ANSI C63.4-2001. All field strength radiated emissions measurements were performed in the semi-anechoic chamber, and for each scan, the procedure for maximizing emissions in Appendices D and E were followed. All field strength radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The test site facility used to collect the radiated and conducted measurement data is located at 7250 Hudson Blvd., Suite 100, Oakdale, Minnesota. This test facility has been fully described in a report dated on March 2003 submitted to FCC. Please reference the site registration number: 90706, dated April 18, 2003.

2.0 SYSTEM TEST CONFIGURATION

2.1 Justification

N/A

2.2 EUT Setup

For simplicity of testing, the transmitter was setup to transmit continuously

2.3 EUT Exercising Software

N/A

2.4 Special Accessories

Remote Technologiesbattery charger using model: HK-CH03-A06 AC Adapter.
USB port.

Note: According to the manufacturers' specification, the T3 remote control transmitter will not operate while it is connected to a PC's USB port. In addition, the T3 will not be able to sync with a PC's USB port while it is transmitting a command. The USB port is only used to download software (by an RTI dealer). Therefore, USB cable was not connected to the T3 remote control transmitter during testing.

2.5 Equipment Modification

No modifications were installed during the testing.

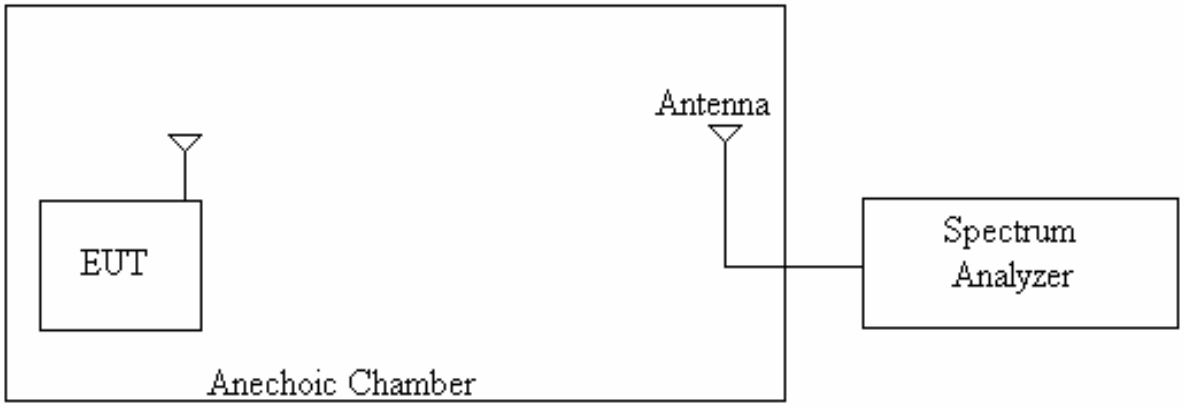
2.6 Support Equipment List and Description

N/A

2.7 Test Configuration Block Diagrams

The EUT was setup as tabletop equipment.
The EUT was powered at 4VDC from Lithium internal rechargeable battery. The battery was fully charged prior to testing.

Field Strength Measurements



3.0 TEST RESULTS

Data is included for the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs, data tables and graphical representations of the emissions are included.

The EUT is intended for operation under the requirements of Part 15 Subpart C. Specific test requirements include the following:

47 CFR 15.231(a)(1)	Transmitting Time
47 CFR 15.231(b)	Field Strength of Fundamental and Spurious Emissions
47 CFR 15.231(c)	Bandwidth of Emissions

The EUT complied with requirements of Part 15 Subpart B:

47 CFR 15.109, Class B	Radiated Emissions
47 CFR 15.107, Class B	Line Conducted Emissions

3.1 Transmitting Time, FCC 15.231(a)(1)

The transmitter transmitted continuously while the activation button was pressed. According to FCC Part 15.231(a)(1) a manually operated transmitter should stop transmitting within 5 sec after release the activation button. The transmitter was deactivates automatically less then 1 sec after releasing the activation button.

3.2 Field Strength of Fundamental and Spurious Emissions, FCC 15.231(b)

Field Strength of Fundamental and Spurious Emissions measurements were made at Fundamental frequency of 433.84MHz; Spurious Emissions were tested up to 4.5GHz (10th harmonic).

The Tables 3-2-1 shows the Field Strength of Fundamental Radiation. The Table 3-2-2 shows Field Strength of Spurious Emissions for T3 Remote Control Transmitter.

Radiated Emissions **Date:** 12/10/2004
Company: Remote Technologies
Model: T3, Remote Control Transmitter
Test Engineer: Uri Spector
Standard: FCC Part 15.231(b)
Test Site: 3 m Anechoic Chamber
Note: Readings below 1GHz were taken with RBW 100kHz
Measurements were taken with CISPR Peak detector

Table # 3-2-1

Frequency	Antenna			Amplifier	Peak Reading	Net at 3m.	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	Factor(dB/m)	Gain (dB)	dBμV	dBμV/m	dBμV/m	dB	
433.844	V	128	19.2	0.0	54.5	73.7	80.8	-7.1	Fund.
433.844	H	213	19.2	0.0	58.5	77.7	80.8	-3.1	Fund.

Radiated Emissions

Date:	12/10/2004
Company:	Remote Technologies
Model:	T3, Remote Control Transmitter
Test Engineer:	Uri Spector
Standard:	FCC Part 15.231(b)
Test Site:	3 m Anechoic Chamber
Note:	Readings below 1GHz were taken with RBW 100kHz and above 1GHz with RBW 1MHz

Table # 3-2-2

Frequency	Antenna	Antenna	Ant Factor	Amplifier	Peak Reading	Net at 3m.	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	(dB/m)	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB	
867.68	V	127	24.7	0.0	23.1	47.8	60.8	-13.0	1
867.68	H	100	24.7	0.0	23.0	47.7	60.8	-13.1	1
1301.52	V	100	27.1	37.3	56.1	45.9	60.8	-14.9	1
1301.52	H	256	27.1	37.3	53.9	43.7	60.8	-17.1	1
1735.36	V	161	28.8	36.0	51.4	44.2	60.8	-16.6	1
1735.36	H	100	28.8	36.0	56.5	49.3	60.8	-11.5	1
2169.20	V	128	30.8	35.5	56.6	51.9	60.8	-8.9	1
2169.20	H	111	30.8	35.5	51.4	46.7	60.8	-14.1	1
3470.72	V	100	35.5	34.3	41.6	42.8	60.8	-18.0	1
3470.72	H	100	35.5	34.3	37.4	38.6	60.8	-22.2	1
3904.56	V	100	36.7	34.1	36.2	38.8	60.8	-22.0	1
3904.56	H	100	36.7	34.1	35.4	38.0	60.8	-22.8	1

Comments: 1. Readings of Spurious Emissions were taken with Peak detector

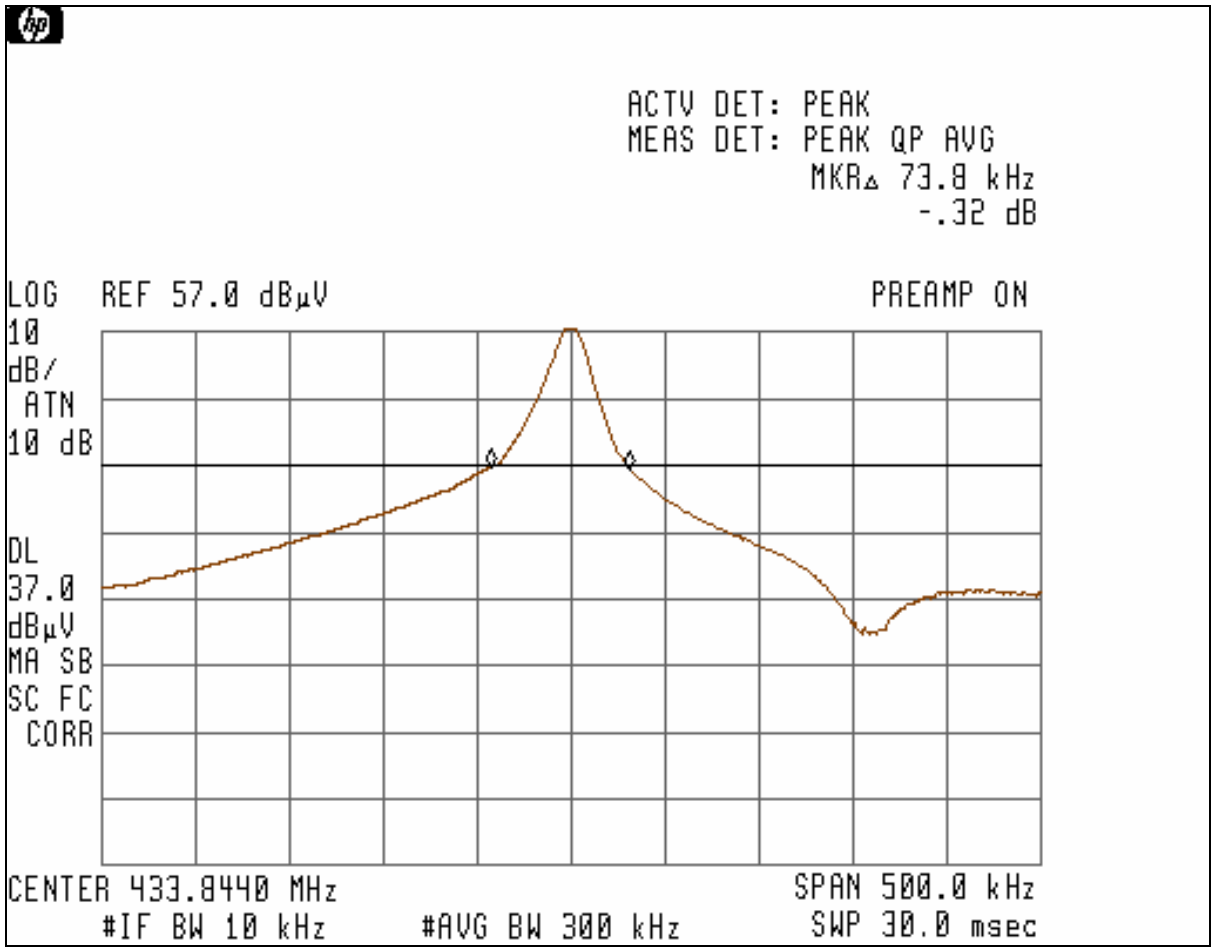
3.3 Bandwidth of Emissions, FCC 15.231(c)

Bandwidth of Emissions measurements was made for frequency of 433.844MHz.

Bandwidth of Emissions at –20dB level was measured at 73.8kHz.
The maximum allowed level is 433.844MHz x 0.25% = 1084.55kHz

The # 3-3-1 shows the Bandwidth of Emissions at –20dB level.

Graph 3-3-1



3.4 Radiated Emissions, FCC 15.109, Class B (T3 remote control transmitter)

The EUT (T3 remote control transmitter) as a digital device was tested according to FCC Part 15.109, Class B in frequency range from 30MHz to 2GHz; emissions at transmitter fundamental frequency and 2nd harmonic were excluded from the Table.
The EUT was tested also for FCC Part 15, Subpart B in charging mode with charger (see Section 3.4.1).

Tables 3-4-1 and 3-4-2 show the Field Strength of Radiated Emissions from 30MHz to 2GHz.

Radiated Emissions **Date:** 12-10-2004
Company: Remote Technologies
Model: T3 Remote Control Transmitter
Test Engineer: Uri Spector
Standard: FCC Part 15.109, Class B
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
All measurements were taken using a peak detector

Table # 3-4-1

Frequency	Ant. Polarity	Peak Reading dBμV	Total CF dB(1/m)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
111.76 MHz	H	14.21	13.06	27.27	43.52	-16.25
111.76 MHz	V	13.80	13.06	26.86	43.52	-16.66
326.57 MHz	H	16.70	16.09	32.79	46.02	-13.23
326.57 MHz	V	17.60	16.09	33.69	46.02	-12.33
463.4 MHz	H	20.22	19.5	39.75	46.02	-6.30
463.4 MHz	V	18.40	19.5	37.90	46.02	-8.12
519.36 MHz	H	22.80	20.62	43.42	46.02	-2.60
519.36 MHz	V	19.90	20.62	40.52	46.02	-5.50
544.63 MHz	H	16.60	20.91	37.51	46.02	-8.51
544.63 MHz	V	13.10	20.91	34.01	46.02	-12.01
697.55 MHz	H	22.00	22.57	43.90	46.02	-2.12
697.55 MHz	V	17.40	22.57	39.97	46.02	-6.05

Radiated Emissions: 1GHz-2GHz

Date:	12/10/2004
Company:	Remote Technologies
Model:	T3 Remote Control Transmitter
Test Engineer:	Uri Spector
Standard:	FCC Part 15.109, Class B
Test Site:	3 m Anechoic Chamber
Note:	Readings above 1GHz were taken with RBW 1 MHz
	All measurements were taken using a peak detector

Table # 3-4-2

Frequency	Antenna	Antenna	Ant Factor	Amplifier	Peak Reading	Net at 3m.	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	(dB/m)	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB	
1065.90	V	100	26.1	38.6	33.5	21.1	54.0	-32.9	
1065.80	H	100	26.1	35.8	31.6	21.9	54.0	-32.1	
1200.00	V	100	27.8	34.9	35.4	28.3	54.0	-25.7	
1200.00	H	198	27.8	34.9	34.1	27.0	54.0	-27.0	
1896.00	V	100	29.8	35.8	41.5	35.5	54.0	-18.5	
1896.00	H	100	29.8	35.8	39.8	33.8	54.0	-20.2	

3.4.1 Line Conducted Emissions, FCC 15.107 & Radiated Emissions FCC 15.109, Class B (T3 remote control charger)

The T3 remote control charger was tested according to FCC Part 15.109 Radiated Emissions and FCC Part 15.107, Class B Line Conducted Emissions. The Table 3-4-3 shows Radiated Emissions data from 30MHz to 1000MHz. Table 3-4-4 & Graphs ## 3-4-1 & 3-4-2 show the Line Conducted Emissions from 150kHz to 30MHz. Testing was performed on the Remote Technologies battery charger using RTI model: HK-CH03-A06AC Adapter in charging mode. Line Conducted Emissions was tested at 120 VAC/60Hz.

Radiated Emissions **Date: 12/11/2004**
Company: Remote Technologies
Model: T3 Remote Control Charger
Test Engineer: Troy Ihle
Standard: FCC Part 15.109, Class B
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
All measurements were taken using peak detector

Table # 3-4-3

Frequency	Antenna			Peak reading	Total Peak	QP Limit	Margin	Comments
MHz	Polarity	Hts(cm)	Factor (dB1/m)	dBµV	dBµV/m	dBµV/m	dB	
45.30	V	100	12.1	18.6	30.7	40.0	-9.3	
53.40	V	100	9.0	18.1	27.1	40.0	-12.9	
60.60	V	100	7.2	17.1	24.3	40.0	-15.7	
109.50	V	100	12.8	19.3	32.1	43.5	-11.5	
112.00	V	100	13.0	20.0	33.0	43.5	-10.5	
123.90	V	100	13.7	20.1	33.8	43.5	-9.7	
130.70	V	100	13.5	19.7	33.2	43.5	-10.3	
136.30	V	100	13.4	21.6	35.0	43.5	-8.5	
61.00	H	276	7.2	15.2	22.4	40.0	-17.6	
99.70	H	225	11.7	17.4	29.1	43.5	-14.4	
117.60	H	248	13.6	21.8	35.4	43.5	-8.2	
131.20	H	231	13.5	19.5	33.0	43.5	-10.5	
136.30	H	274	13.4	22.0	35.4	43.5	-8.1	

Conducted Emissions **Date:** 12/10/2004
Company: Remote Technologies
Model: T3 Remote Control Charger
Test Engineer: Troy Ihle
Special Config. Info: Charging mode
Standard: FCC Part 15.107, Class B
Note: The table shows the worst case conducted emissions
All measurements were taken using a CISPR Quasi-peak detector

Table # 3-4-4

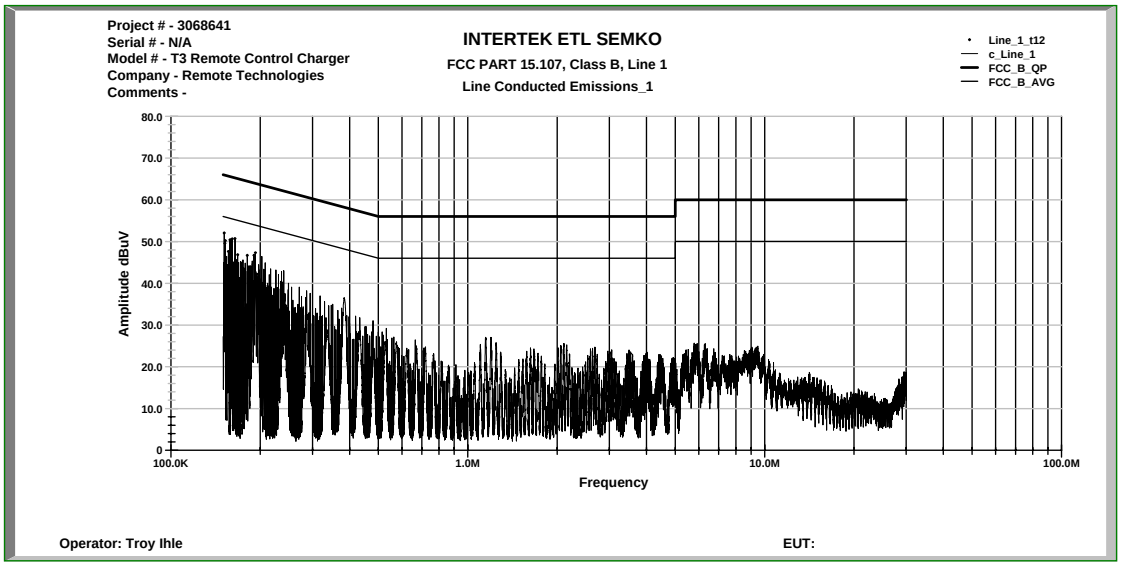
Line 1

Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
150.18 KHz	44.0	17.7	66.0	-22.0	56.0	-38.3
150.54 KHz	43.5	16.3	66.0	-22.5	56.0	-39.7
150.95 KHz	43.9	17.7	66.0	-22.1	56.0	-38.3
155.3 KHz	42.7	13.6	65.9	-23.2	55.9	-42.3
157.35 KHz	42.2	12.4	65.8	-23.6	55.8	-43.4
159.27 KHz	41.8	12.0	65.7	-23.9	55.7	-43.7
159.55 KHz	42.0	12.1	65.7	-23.8	55.7	-43.6
164.36 KHz	41.0	11.5	65.6	-24.6	55.6	-44.1
165.14 KHz	40.8	11.3	65.6	-24.8	55.6	-44.2
180.52 KHz	43.9	28.9	65.1	-21.2	55.1	-26.2
189.12 KHz	38.3	13.0	64.9	-26.6	54.9	-41.9
192.31 KHz	37.5	8.6	64.8	-27.3	54.8	-46.2

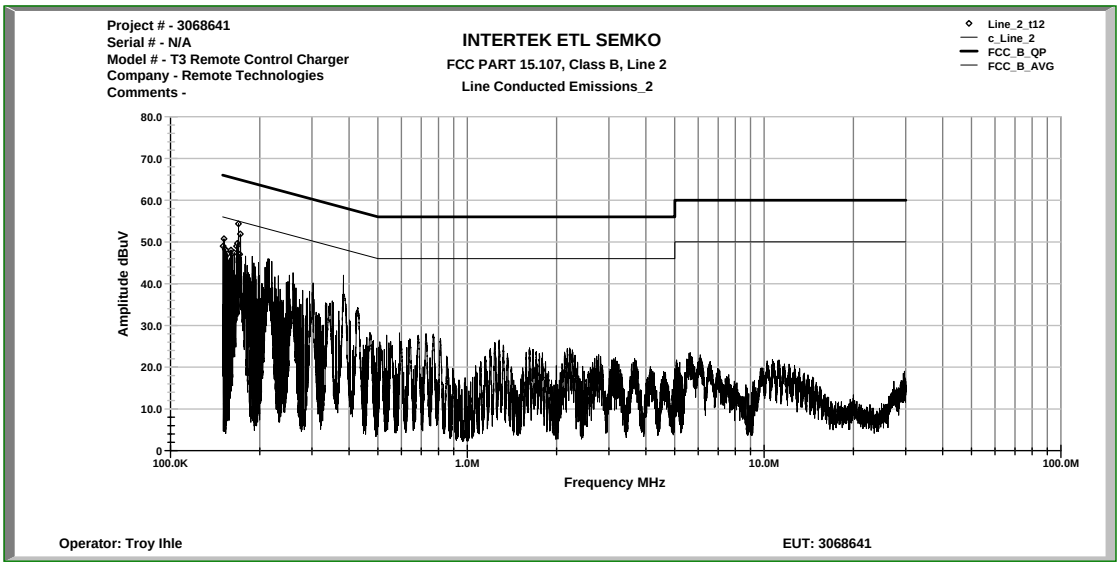
Line 2

Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
150.03 KHz	42.0	12.7	66.0	-24.0	56.0	-43.3
150.56 KHz	42.1	12.6	66.0	-23.8	56.0	-43.4
151.76 KHz	41.9	13.7	66.0	-24.0	56.0	-42.3
152.82 KHz	41.8	13.8	65.9	-24.1	55.9	-42.1
154.36 KHz	41.5	16.2	65.9	-24.3	55.9	-39.6
161.16 KHz	50.5	35.4	65.7	-15.2	55.7	-20.3
163.27 KHz	41.1	18.8	65.6	-24.5	55.6	-36.8
163.36 KHz	45.2	26.3	65.6	-20.4	55.6	-29.4
164.09 KHz	51.0	35.9	65.6	-14.6	55.6	-19.7
169.97 KHz	39.5	11.3	65.4	-26.0	55.4	-44.1
170.46 KHz	39.6	11.3	65.4	-25.9	55.4	-44.2
173.84 KHz	39.0	10.9	65.3	-26.4	55.3	-44.4

Graph # 3-4-1



Graph # 3-4-2



3.5 Test Procedure

Field Strength Measurements

The EUT was placed on a non-conductive table 0.8m above the ground plane inside the Anechoic Chamber. The table was centered on a motorized turntable, which allows 360-degree rotation. The measurement antenna was positioned at 3m distance. The Bicono-Log antenna was used in frequency range from 30MHz to 1GHz, and the Horn antenna was used in frequency range above 1GHz. The radiated emissions were maximized by configuring the EUT through its placement in three orthogonal axes, by rotating the EUT, by changing antenna polarization, and by changing antenna height from 1 to 4m. Method of the direct Field Strength Calculation is shown in Section 3.6.

3.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where: FS = Field Strength in dB(µV/m)
RA = Receiver Amplitude in dB(µV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(m^{-1})
AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(µV) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(µV/m).

RA = 48.1 dB(µV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(µV/m)

In the tables the Cable correction factors are included to the Antenna Factors.

Tested by:

Uri Spector
EMC Project Engineer
Intertek ETL SEMKO

Signature

Date: September 13, 2004

4.0 TEST EQUIPMENT

Receivers/Spectrum Analyzers

DESCRIPTION	SERIAL NO.	LAST CAL	CAL DUE	USED
HP85462A Receiver RF Section	3549A00306	01/04	01/05	X
HP85460A RF Filter Section	3448A00276	01/04	01/05	X
Advantest Spectrum Analyzer R3271A	55050084	06/04	06/05	X
TILE! Instrument Control System	ver. 3.4.C.2	N/A	N/A	X

Antennas/Pre-Amplifiers

DESCRIPTION	SERIAL NO.	LAST CAL	CAL DUE	USED
Schaffner-Chase Bicono-Log Antenna	2468	01/04	01/05	X
EMCO Horn Antenna 3115	6579	01/04	01/05	X
HP 83017A Pre-Amplifier	3123A00475	05/04	05/05	X

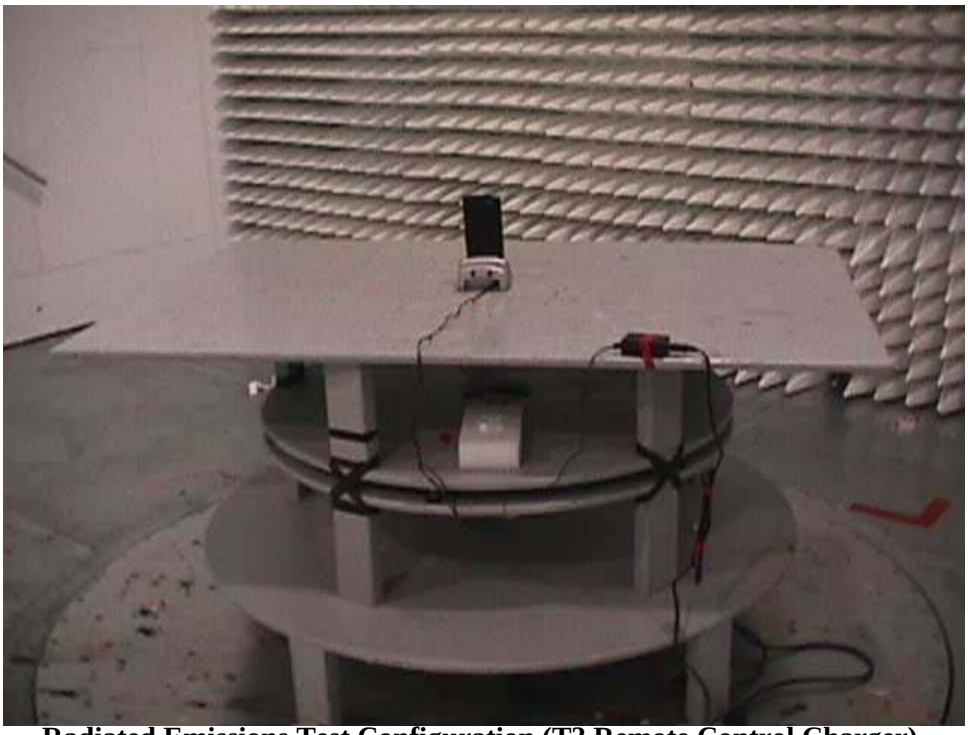
Artificial Mains Networks/Absorbing Clamps

DESCRIPTION	SERIAL NO.	LAST CAL	CAL DUE	USED
FCC LISN-2	316	05/04	05/05	X

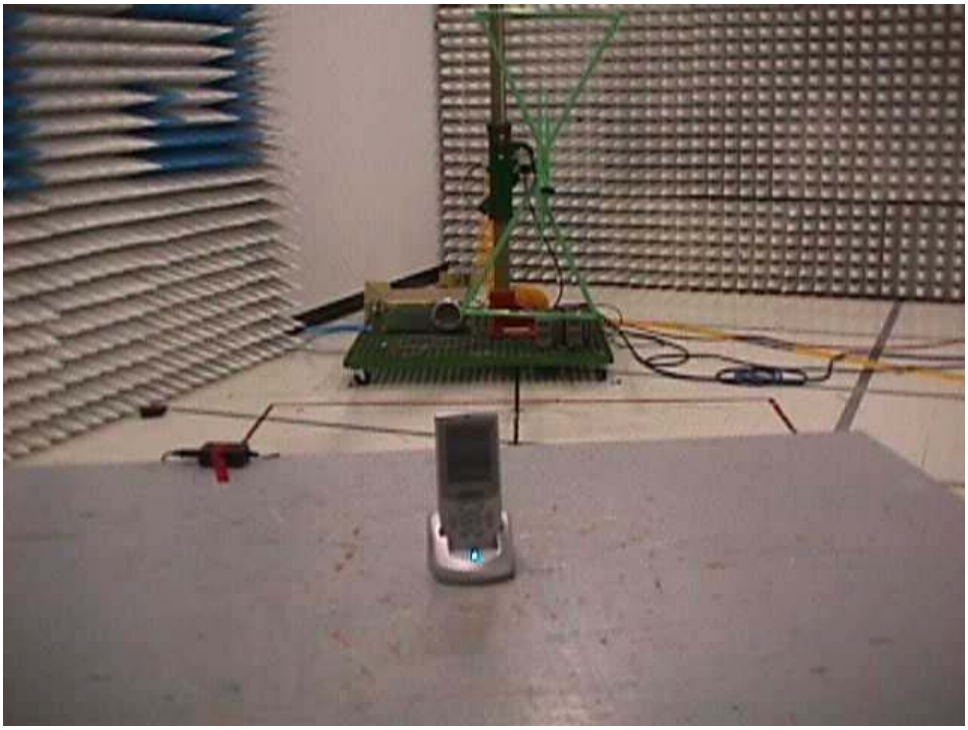
EXHIBIT 1
CONFIGURATION PHOTOS

Radiated Emissions Test Configuration (T3 Remote Control Transmitter)

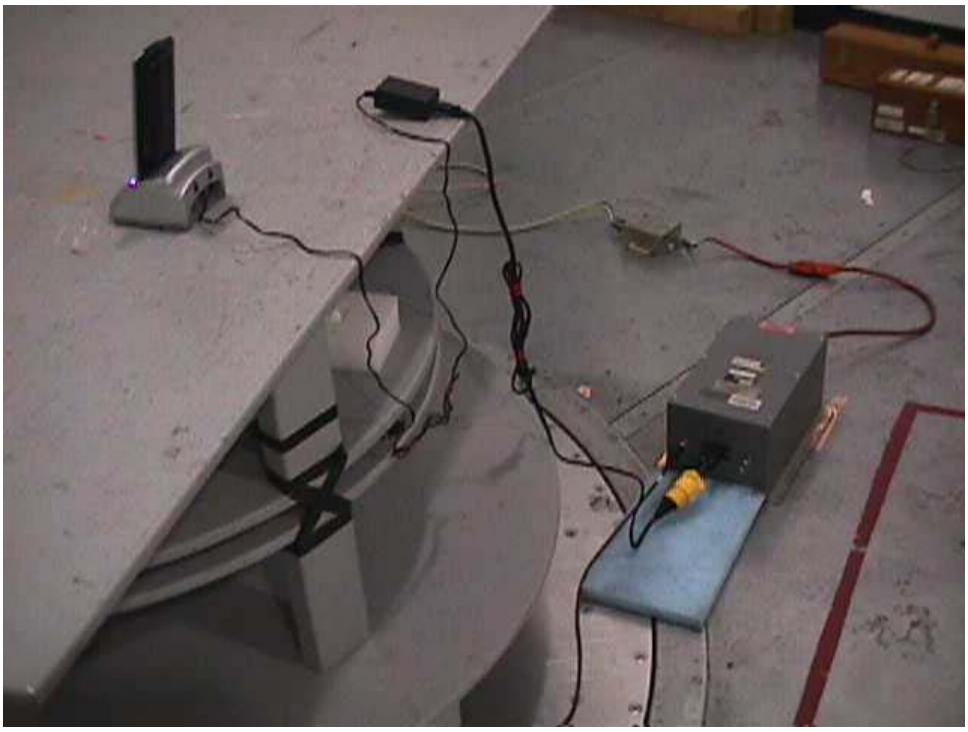
Radiated Emissions Test Configuration (T3 Remote Control Transmitter)



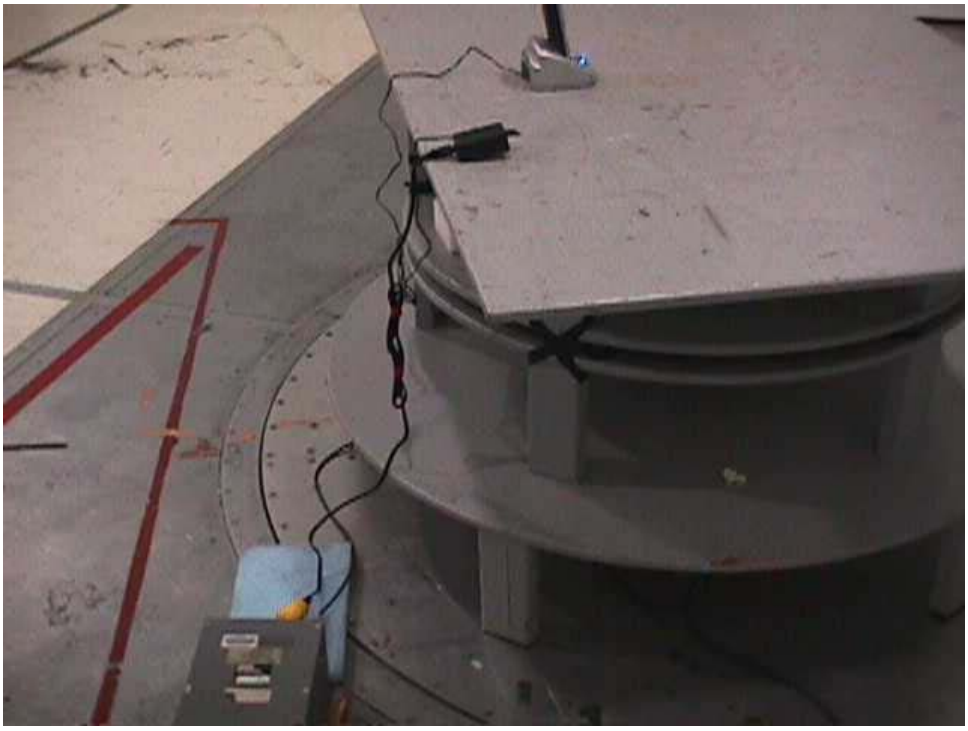
Radiated Emissions Test Configuration (T3 Remote Control Charger)



Radiated Emissions Test Configuration (T3 Remote Control Charger)



Line Conducted Emissions Test Configuration (T3 Remote Control Charger)



Line Conducted Emissions Test Configuration (T3 Remote Control Charger)