



**DATE: 25 February 2013**

**I.T.L. (PRODUCT TESTING) LTD.**

# **FCC EMC Test Report**

**(Equipment Authorization Under FCC Verification Process)**

**for**

**Pointer Telocation Ltd.**

**Equipment under test:**

**Asset Tracking Device**

**CelloTrack3G Power P/N GT9740001-000, CelloTrack3G LighterP/N GT9740005-000\*;**


**CelloTrack3G IP67 P/N GT9740012-000\*;**


**CelloTrack3G Power 6M P/N GT9740021-000\* ;CelloTrack3G 6M P/N GT9740022-000\*;**

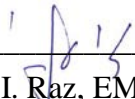
**CelloTrack3G Lighter 6M P/N GT9740023-000\*;**

**CelloTrack3G XT P/N GT9740025-000\* ; CelloTrack3G Power XT P/N GT9740026-000\***

\* See customer's declaration on page 4.

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Y. Raz, Documentation

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Approved by:   
I. Raz, EMC Laboratory Manager

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# 1. General Information

## 1.1 Administrative Information

Manufacturer:	Pointer Telocation Ltd.
Manufacturer's Address:	14 Hamelacha St., Rosh Ha'ayin, 48091 Israel Tel: +972-3-572-3111 Fax: +972-3-572-3100
Manufacturer's Representative:	Itamar Gohary
Equipment Under Test (E.U.T):	CelloTrack3G Power P/N GT9740001-000, CelloTrack3G Lighter P/N GT9740005-000*; CelloTrack3G IP67 P/N GT9740012-000*; CelloTrack3G Power 6M P/N GT9740021-000*; CelloTrack3G 6M P/N GT9740022-000*; CelloTrack3G Lighter 6M P/N GT9740023-000*; CelloTrack3G XT P/N GT9740025-000*; CelloTrack3G Power XT P/N GT9740026-000*
Equipment Model No.:	Not designated
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	05.12.2012
Start of Test:	05.12.2012
End of Test:	10.12.2012
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 71100
Test Specifications:	See Section 2

\* See customer's declaration on following page.



**POINTER**



Cellocator Division  
Pointer Telocation Ltd.

Date: 26 December 2012

### Declaration

I hereby declare that the **CelloTrack3G Power P/N GT9740001-000** is a full configuration model. The below model's:

<i>Product Name:</i>	<i>Part Number:</i>
CelloTrack3G Lighter	GT9740005-000
CelloTrack3G IP67	GT9740012-000
CelloTrack3G Power 6M	GT9740021-000
CelloTrack3G 6M	GT9740022-000
CelloTrack3G XT	GT9740025-000
CelloTrack3G Power XT)	GT9740026-000

differs from the **CelloTrack3G Power P/N GT9740001-000** only by different Internal battery type\removal of battery charger components\External Harness connection. Please relate to all models (from an EMC/Radio point of view) as the same product.

Thank you,  
Signature: \_\_\_\_\_

*Pointer Telocation Ltd.*

**Itamar Gohary**  
Certification Manager  
Pointer Telocation Ltd.



## 1.2 Abbreviations and Symbols

The following abbreviations and symbols are applicable to this test report:

AC	alternating current
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
db $\mu$ V	decibel referred to one microvolt
db $\mu$ V/m	decibel referred to one microvolt per meter
DC	direct current
EMC	electromagnetic compatibility
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlett Packard
Hz	Hertz
kHz	kilohertz
kV	kilovolt
LED	light emitting diode
LISN	line impedance stabilization network
m	meter
mHn	millihenry
MHz	megahertz
msec	millisecond
N/A	not applicable
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt



### 1.3 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 861911.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-3006, R-2729, T-1877, G-245.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025A-1.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.



## 2. Applicable Documents

- 2.1 **Code of Federal Regulations Title 47,  
Federal Communications Commission  
Part 15, Subpart B.  
Rev. November 08, 2012  
GPO Access Web Site** *Unintentional Radiators.*
- 2.2 **ANSI C63.4-2003** *American National Standards for  
Methods of Measurement of Radio-  
Noise Emissions from Low-Voltage  
Electrical and Electronic Equipment  
in the Range of 9 kHz to 40 GHz.*



## 3. Test Site Description

### 3.1 Location:

The Electromagnetic Compatibility Test Facility of I.T.L. (Product testing) Ltd. Is located at

Telrad Industrial Park, Lod, 71100 Israel.

Telephone: +972-8-9153100

Fax: +972-8-9153101

### 3.2 Open Site:

The OATS is located on a one floor-building roof. The OATS consists of 3 meter and 10 meter ranges, using a 21.5m X 8.5m solid metal ground plane, a remote controlled turntable and an antenna mast.

### 3.3 Ground Plane:

The ground plane is made from steel plates, which are welded continuously together. The Ground plane is lies and welded on welded steel construction with vias to allow for water drainage.

All the power, control, and signal lines to the turntable and the 3 m and 10m antenna mast outlets are routed in shielded conduits under the plane to the control building.

### 3.4 Antenna Mast:

ETS model 2070-2. The antenna position and polarization are remote controlled via Fiber Optical Link using ETS/EMCO Dual Controller Type 2090. The antenna position is adjustable between 1-4 meters. Pressurized air is used to power changing the polarity of the antenna.

### 3.5 Turntable:

ETS model 2087 series. The position of the turntable is remote-controlled via Fiber Optic Link, using ETS/EMCO Dual Controller Type 2090. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane. Brushes near the periphery of the turntable ensure good conductive connection to the ground plane. The Turntable maximum load is 1250 Kg.

### 3.6 EMI Receiver:

Type 1066.301, manufactured by Rhode & Schwarz, being in full compliance with CISPR 16 requirements.

### 3.7 E.U.T. Support:

Table mounted E.U.T.s are supported during testing on 80 cm high all-wooden tables (no metal nails or screws).

### 3.8 Test Equipment:

See details in Section 6.



## 4. System Test Configuration

### 4.1 Mode of Operation

The E.U.T. was fully operative and transmitted in a high rate of one transmission per 4 seconds to Pointer servers

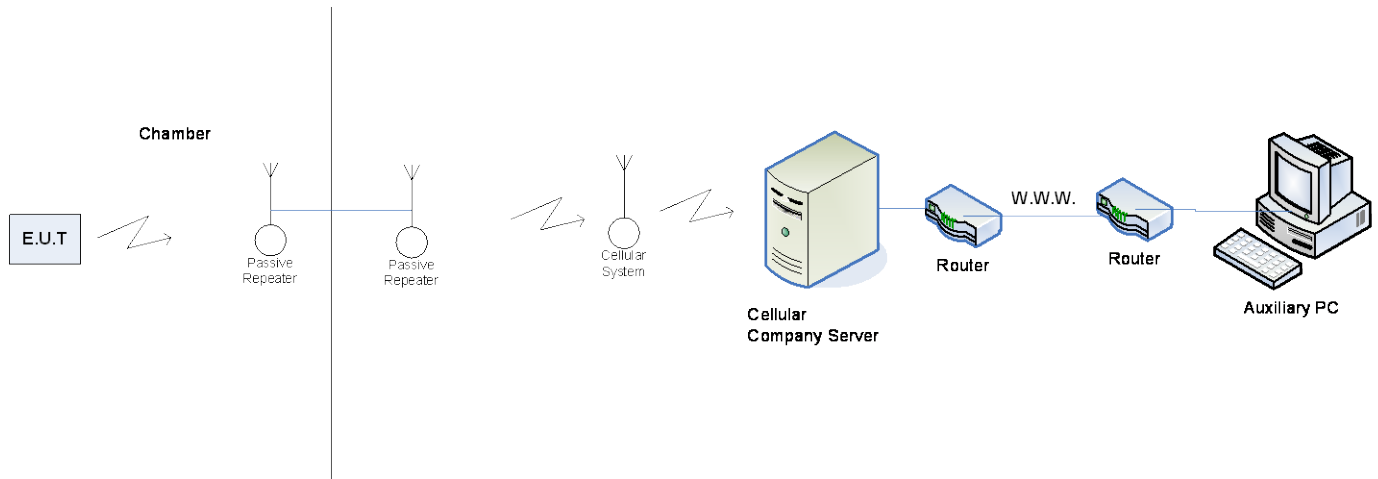


Figure 1. Configuration of Tested System

### 4.2 Equipment Modifications

No modifications were required in order to achieve compliance.



## 5. Summary of Test Results

Test	Results
<p><b>Radiated Emissions</b> FCC Part 15, Subpart B Class B</p>	<p>The E.U.T met the performance requirements of the specification.</p> <p>The margin between the emission level and the specification limit is 5.2 dB in the worst case at the frequency of 173.24 MHz, vertical polarization.</p>



## 6. Equipment Under Test (E.U.T.) Description

The CelloTrack family is comprised of a small, standalone tracking device intended for mobile assets and assets having limited access to power or without a power supply at all.

The capabilities provided by the CelloTrack family can greatly reduce an enterprise's financial losses incurred as a result of the often difficult task of successfully tracking equipment such as trailers, containers and trains.

CelloTrack supports tracking, communication, GPS location-based features and maintenance capabilities similar to the compact family and supports also the following additional features:

Durability and long life, making it ideal for tracking trailers, trains, containers, high-value assets, and more.

Stand-alone tracking device. May be installed without a power supply.

An internal long-life 13.6 AHr rechargeable Li-Polymer battery providing up to three years of autonomous operation without recharging (subject to the rate of transmission).

Advanced power management algorithms preserving battery power and extending battery life period.

Highly durable IP67 weatherproof casing that houses all components – battery, GSM module and GPS module.

A 3D accelerometer that detects movement of assets and enables different transmission rates for a moving asset and a standing asset.

A programmable (ON/OFF/Test/Panic) push button, charging and communication capabilities, a tamper switch to detect tampering and two monitoring LEDs.

Almost instant assembly and removal.

Minimal maintenance.

The CelloTrack family includes the following units:

CelloTrack (regular).

CelloTrack Power.

CelloTrack Lighter.

CelloTrack IP67 6M.

CelloTrack Power 6M.

CelloTrack Lighter 6M.

CelloTrack XT.

CelloTrack XT Power.



## 7. List of Test Equipment

### 7.1 Emission Tests

The equipment indicated below by an "X" was used for testing Conducted Emission (CE) and Radiated Emission (RE)

Test equipment calibration is in accordance with ITL Q.A. Procedure PM 110 "Calibration Control Procedure", which complies with ISO 9002 and ISO/IEC Guide 17025.

Instrument	Manufacturer	Model	Serial No.	Used in Test	
				CE	RE
LISN	EMCO	3810/2BR	1297		
Transient Limiter	HP	11947A	3107A03041		
RF Amplifier	HP	8447F	3113A06386		X
EMI Receiver	Rohde & Schwarz	ESCI7	100724		
EMI Receiver	Rohde & Schwarz	1066.301	100120		X
Biconilog Antenna	EMCO	3142B	1250		X
Horn Antenna	ETS	3115	6142		
Antenna Mast	ETS	2070-2	9608-1497		X
Turntable	ETS	2087	-		X
Mast & Table Controller	ETS/EMCO	2090	9608-1456		X



## 8. Radiated Emission

### 8.1 Test Specification

30-1000 MHz, FCC Part 15, Subpart B, CLASS B

### 8.2 Test Procedure

The E.U.T operation mode and test set-up are as described in section 4.1.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in *Figure 3. Radiated Emission Test*.

The E.U.T. highest frequency source or used frequency is 8 MHz.

The frequency range 30-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters.

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

Where:

FS: Field strength [dB $\mu$ V/m]

RA: Receiver Amplitude [dB $\mu$ V]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable attenuation Factor [dB]

Example: FS = 30.7 dB $\mu$ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB $\mu$ V



### 8.3 Test Results

The E.U.T met the requirements of the FCC Part 15, Subpart B ,Class B specification.

The margin between the emission level and the specification limit is 5.2 dB in the worst case at the frequency of 173.24 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 2*.



## Radiated Emission

E.U.T Description    Asset Tracking Device  
Type                    CelloTrack3G Power P/N GT9740001-000  
Serial Number:        Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal/Vertical      Frequency range: 30 MHz to 1000 MHz  
Antenna: 3 meters distance                        Detectors: Peak, Quasi-peak

Frequency (MHz)	Peak Amp dBµV/m	QP Amp dBµV/m	Antenna Polarization:		Limit dBµV/m	Margin (dB)
			Hor.	Ver.		
698.49	40.2	37.5	X		46.0	-8.5
388.87	38.5	35.3	X		46.0	-10.7
543.25	39.5	37.6	X		46.0	-8.4
560.26	35.6	30.6	X		46.0	-15.4
749.00	39.3	33.7	x		46.0	-12.3
128.13	32.6	28.9		X	43.5	-14.6
144.30	33.5	29.7		X	43.5	-13.8
34.68	29.5	27.1		X	40.0	-12.9
173.24	42.3	38.3		x	43.5	-5.2

**Figure 2. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.  
Detectors: Peak, Quasi-peak**

*Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

## 9. Set Up Photographs




**Figure 3. Radiated Emission Test**





## 10. Signatures of the E.U.T's Test Engineers

Test	Test Engineer Name	Signature	Date
Radiated Emissions	D. Yadidi		30.12.12



## 11. APPENDIX A - CORRECTION FACTORS

### 11.1 Correction factors for

### CABLE

from EMI receiver  
to test antenna  
at 3 AND 10 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
30	1.96	700	11.25
35	2.08	800	12.53
40	2.26	900	13.86
45	2.43	1000	14.86
50	2.59	1200	15.7
55	2.65	1400	17.05
60	2.86	1600	18.2
65	2.96	1800	19.4
70	3.04	2000	21.3
75	3.27		
80	3.41		
85	3.54		
90	3.68		
95	3.77		
100	3.93		
110	4.19		
120	4.41		
130	4.6		
140	4.83		
150	5.06		
160	5.35		
170	5.57		
180	5.7		
190	5.84		
200	6.02		
250	6.86		
300	7.59		
350	8.09		
400	8.7		
450	9.15		
500	9.53		
550	9.82		
600	10.24		
650	10.74		

*NOTES:*

1. The cable type is RG-214/U



## 11.2 Correction factors for GAIN

## Amplifier 8447F 30M-1.3G

<b>FREQUENCY (MHz)</b>	<b>GAIN (dB)</b>
<b>20</b>	<b>27.16</b>
<b>30</b>	<b>27.18</b>
<b>50</b>	<b>27.15</b>
<b>100</b>	<b>27.01</b>
<b>200</b>	<b>26.48</b>
<b>500</b>	<b>27.54</b>
<b>1000</b>	<b>26.96</b>
<b>1100</b>	<b>26.69</b>
<b>1200</b>	<b>26.28</b>
<b>1300</b>	<b>25.85</b>



### 11.3 Correction factors for

**Bilog ANTENNA**

**Model: 3142**

**Antenna serial number: 1250**

**3 meter range**

<b>FREQUENCY</b>	<b>AFE</b>	<b>FREQUENCY</b>	<b>AFE</b>
<b>(MHz)</b>	<b>(dB/m)</b>	<b>(MHz)</b>	<b>(dB/m)</b>
30	18.4	1100	25
40	13.7	1200	24.9
50	9.9	1300	26
60	8.1	1400	26.1
70	7.4	1500	27.1
80	7.2	1600	27.2
90	7.5	1700	28.3
100	8.5	1800	28.1
120	7.8	1900	28.5
140	8.5	2000	28.9
160	10.8		
180	10.4		
200	10.5		
250	12.7		
300	14.3		
400	17		
500	18.6		
600	19.6		
700	21.1		
800	21.4		
900	23.5		
1000	24.3		



## 12. 11.4 APPENDIX B - MEASUREMENT UNCERTAINTY

### 12.1 Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for  
open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

$\pm 4.98$  dB



## 13. Appendix C - FCC Verification Process Instructions

- Label

### Prepare Label

- Design a FCC compliance label that will be affixed to all units marketed.
- The label must include the compliance statement below.

Example of Label:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note - The label may also contain other information, such as the model number, the country of origin, etc. (The country of origin information is required by Customs and the Federal Trade Commission for imports to the U.S.)

Small Products:

If the product is too small for a label containing the statement above, the information paragraph required must be placed in a prominent location in the instruction manual or, alternatively, the information can be placed on the container in which the product is marketed.

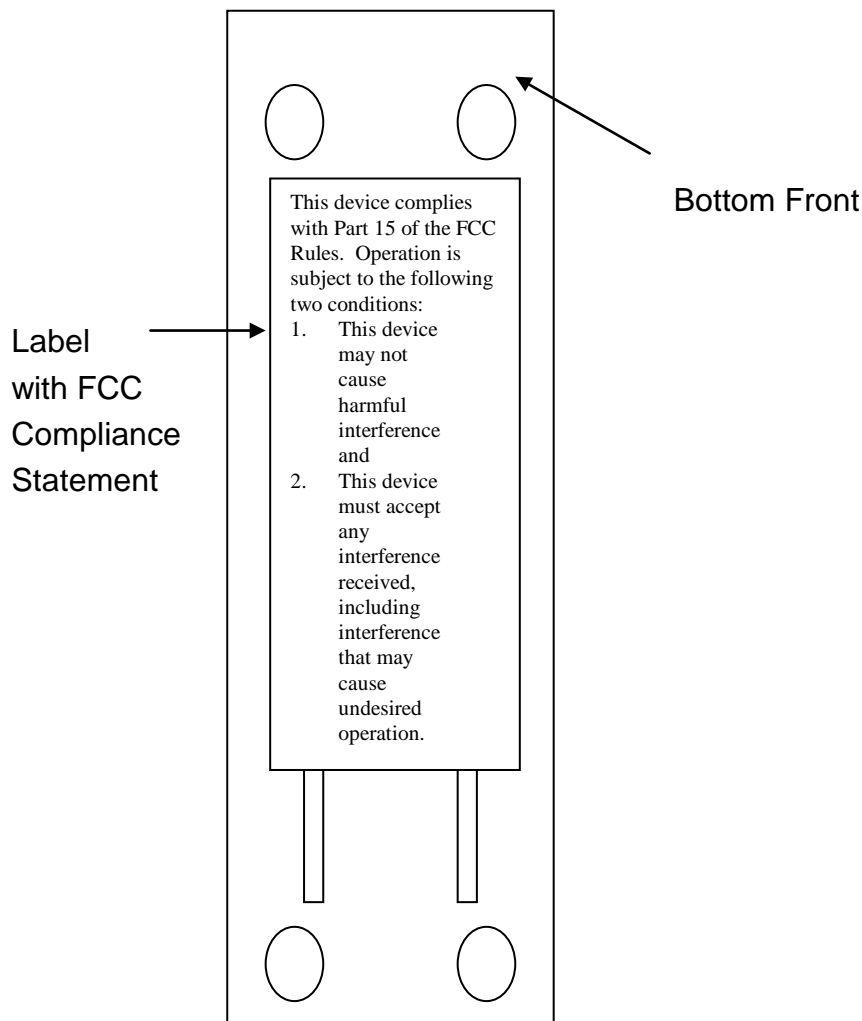
- **Label**

The FCC requires that the compliance statement above be placed in a “conspicuous location on the device.”

The following are the FCC Rules about how the label will be permanently attached.:

The label is expected to last the life of the product. It must be permanently marked (etched, engraved, indelibly printed, etc.) either directly on the device, or on a tag that is permanently affixed (riveted, welded, etc.) to the device.

Example of Product with Label:





- **FCC Compliance Statement**

## **FCC Compliance Statement in User's Manual**

For a Class A or Class B digital device or peripheral, the instructions given to the user shall include the following, or a similar, statement that should be placed in a prominent location in the text of the manual. (from FCC Rules 15.105)

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. (from FCC Rules 15.21)

Information about any special accessories needed to ensure FCC compliance must also be included.

Sample User Information for a Class A digital device:

### **The FCC Wants You to Know**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

### **FCC Warning**

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.





## Sample User Information for a Class B digital device:

### The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

### FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.