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DATE: 13 July 2014

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

Test Report According to EN 301 511 V9.0.2: 2003

for

Pointer Telocation Ltd.

Equipment under test:

Asset Tracking Device

CelloTrack Power 3Y P/N GT976001-000;
CelloTrack 3Y P/N GT9760012-000;
CelloTrack XT P/N GT9760025-000;
CelloTrack 8M P/N GT9760022-000;
CelloTrack Power XT P/N GT9760026-000;
CelloTrack Power 8M P/N GT9760021-000*

*See customer's Declaration on page 4

Written by: _____
R. Pinchuck, Documentation

Approved by: _____
A. Sharabi, Test Engineer

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):	Asset Tracking Device
Equipment Model No.:	CelloTrack Power 3Y P/N GT976001-000; CelloTrack 3Y P/N GT9760012-000; CelloTrack XT P/N GT9760025-000; CelloTrack 8M P/N GT9760022-000; CelloTrack Power XT P/N GT9760026-000; CelloTrack Power 8M P/N GT9760021-000*
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	07.07.14
Start of Test:	07.07.14
End of Test:	07.07.14
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	See Section 2

*See customer's Declaration on following page.

POINTER

Cellocator Division
Pointer Telocation Ltd.

Date: 24 July 2014

Declaration

I hereby declare that the **CelloTrack Power 3Y GT9760001-000** is a full configuration model. The below model's:

Product Name:	*Part Number:*
GT9760012-000	CelloTrack 3Y
GT9760025-000	CelloTrack XT
GT9760022-000	CelloTrack 8M
GT9760026-000	CelloTrack Power XT
GT9760021-000	CelloTrack Power 8M

differs from the **CelloTrack Power 3Y GT9760001-000** only by diffrent 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.

POINTER TELOCATION LTD. 14 HAMELACHA ST., ROSH HA'AYIN 48091, ISRAEL • TEL: 972-3-5723111 • FAX: 972-3-5723100 • www.pointer.com

1.2 Abbreviations and Symbols

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

A/m	ampere per meter
AC	alternating current
AM	amplitude modulation
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dbµV	decibel referred to one microvolt
dbµV/m	decibel referred to one microvolt per meter
DC	direct current
EFT/B	electrical fast transient/burst
EMC	electromagnetic compatibility
ESD	electrostatic discharge
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlitt 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
per	period
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt
V/m	volt per meter
VRMS	volts root mean square

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. 90715.
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-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.

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	**R&TTE Directive: 1999**	*DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity*
2.2	**EN 301 511 V9.02: 2003**	*Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)*
2.3	**ETSI TS 151 010-1 V7.10.0: 2008**	*Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 7.10.0 Release 7)*

3. Test Site Description

3.1 Location

The Electromagnetic Compatibility Test Facility of I.T.L. (PRODUCT TESTING) LTD. is located at Kfar Bin Nun, Israel 99780

Telephone: + 972-8-9797799, Fax: + 972-8-9797702

3.2 Shielded Room

A Modular Shielded Room, Type S81, manufactured by Rayproof, consisting of a Main Room and a Control Room.

The dimensions of the Main Room are: length: 7.4 m, width: 4.35 m, height: 3.75 m.

The dimensions of the Control Room are: length: 3.12 m, width: 2.5 m, height: 2.5 m.

The shielding performance is:

magnetic field: 60 dB at 10 kHz rising linearly to 100 dB at 100 kHz,
electric field: better than 110 dB between 50 MHz and 1 GHz,
plane wave: 110 dB between 50 MHz and 1 GHz.

All the power lines entering both shielded rooms are filtered.

3.3 Open Test Site

Consists of 3 meter and 10 meter ranges, using a 7x14 meter solid metal ground plane, a remote controlled turntable and an antenna mast. The turntable and the tested equipment that is placed on it are environment protected. All the power, control and signal lines are routed under the ground plane.

3.4 Antenna Mast

Type AAM-4/A, manufactured by Antenna Research Associates (ARA). The antenna position and polarization are remotely controlled via Fibre Optical Link using ARA Dual Controller Type ACU-2/5, and pressurized air.

The antenna position is adjustable between 1-4 meters.

3.5 Turntable

Type ART-1001/4, manufactured by ARA. The position of the turntable is remotely controlled via a Fibre Optic Link, using ARA Dual Controller Type ACU-2/5. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane.

3.6 EMI Receiver

Type HP8542E, including HP85420E R.F. filter manufactured by Hewlett-Packard, being in full compliance with CISPR 16 requirements.

3.7 Test Equipment

See details in Section 6.

4. Summary of Test Results

Test	Results
Spurious Emissions EN 301 511 V9.02:2003 Clause 5.2.16 TS 151 010-1 V7.10.0: 2008 Clause 12.2.1	The E.U.T met the performance requirements of the specification. The margin between the spurious emission level and the specification limit is 5.21 dB in the worst case at the frequency of 1863.00 MHz, vertical polarization.

5. 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 3Y;
CelloTrack XT;
CelloTrack 8M;
CelloTrack Power 3Y;
CelloTrack Power XT;
CelloTrack Power 8M.

List of Test Equipment

5.1 Emission Tests

The equipment indicated below by an "X" was used for testing Spurious Radiated Emissions, EN 301 511 V9.0.2: 2003, Clause 5.2.16.

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
Dipole Antenna Set	CDI	A100	597	X
Spectrum Analyzer	HP	8592L	3826A01204	X
Spectrum Analyzer	HP	8591E	3414U01226	X
Receiver	HP	85420E/85422E	3427A00103/34	X
Antenna - Biconical	ARA	BCD-235/B	1041	X
Antenna - Log Periodic	A.H..Systems, Inc.	SAS-200/511	253	X
Antenna - Log Periodic	ARA	LPD-2010/A	1038	X
Antenna Mast	ARA	AAM-4A		X
Turntable	ARA	ART-1001/4		X
Mast & Table Controller	ARA	ACU-2/5	1001	X
Double Ridge Guide	EMCO	3115	9702-5111	X

6. Mode of Operation

The E.U.T. was operated, transmitting to, and receiving information from the operator, through the GSM module. The operator sent and received the information via the auxiliary laptop.

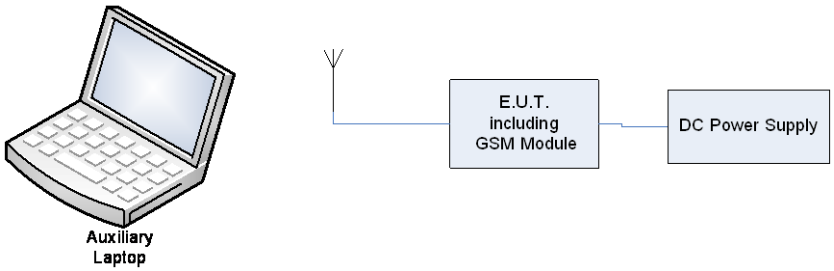

Figure 1. Test Set-up

7. Radiated Emissions

7.1 Test Specification

EN 301 511 V9.02: 2003, Clause 5.2.16

TS 151 010-1 V7.10.0: 2008, Clause 12.2.

7.2 Test Procedure

The test was performed in the frequency bands cellular and DCS 1800.

The E.U.T. was operated as described in Section 7.

A preliminary measurement to identify spurious emissions except for the fundamental and harmonics was performed inside the shielded room. The E.U.T. was tested transmitting and receiving through a passive repeater in two bands cellular and DCS1800. None of the spurious emissions detected were generated by the non-radio part of the unit. The E.U.T. was then transferred to the OATS.

Scanning the frequency range of 30 MHz to 4 GHz was performed. The spurious signals were recorded.

The EMI receiver was operated with 120kHz resolution bandwidth and 300kHz video bandwidth.

The E.U.T. was replaced by the substitution antenna and a signal generator.

The signal generator was adjusted to the same level at the substitution antenna as the level measured with the E.U.T. This level was recorded.

The above tests were performed in both horizontal and vertical polarizations.

The maximum signal generator levels were recorded as the test results.

7.3 Test Results

The E.U.T met the requirements of EN 301 511 V9.02: 2003, Clause 5.2.16.

Additional details are given in *Figure 2*.

The margin between the spurious emission level and the specification limit is 5.21 dB in the worst case at the frequency of 1863.00 MHz, vertical polarization.

Spurious Emissions DCS 1800 Band

E.U.T Description	Asset Tracking Device
Type	CelloTrack Power 3Y P/N GT976001-000
Serial Number:	Not designated

Specification: EN 301 511 V.9.0.1: 2003, Clause 5.2.16

Frequency (MHz)	E (dBµV/m)	Antenna Pol. (H/V)	Power Output Generator (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Spec. (dBm)	Margin (dB)
1863.0	40.8	V	-57.44	5.7	7.68	-53.31	-47.0	-6.31
1863.0	41.9	V	-56.34	5.7	7.68	-52.21	-47.0	-5.21
2752.0	42.5	V	-58.3	8.4	8.4	-56.15	-47.0	-9.15
2752.0	42.7	V	-58.1	8.4	8.4	-55.95	-47.0	-8.95

Figure 2. Spurious Emissions Vertical Polarity

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.

8. Set Up Photographs

Figure 3 Spurious Emission Test

9. Signatures of the E.U.T's Test Engineers

Test	Test Engineer Name	Signature	Date
Spurious Emission	A. Sharabi		11.08.14

10. APPENDIX A - CORRECTION FACTORS

10.1 Correction factors for CABLE

**from EMI receiver
to test antenna
at 3 meter range.**

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3
20.0	0.6
30.0	0.8
40.0	0.9
50.0	1.1
60.0	1.2
70.0	1.3
80.0	1.4
90.0	1.6
100.0	1.7
150.0	2.0
200.0	2.3
250.0	2.7
300.0	3.1
350.0	3.4
400.0	3.7
450.0	4.0
500.0	4.3
600.0	4.7
700.0	5.3
800.0	5.9
900.0	6.3
1000.0	6.7

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	7.3
1400.0	7.8
1600.0	8.4
1800.0	9.1
2000.0	9.9
2300.0	11.2
2600.0	12.2
2900.0	13.0

NOTES:

1. The cable type is RG-214.

2. The overall length of the cable is 27 meters.

3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

10.2 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.

2. The overall length of the cable is 10 meters.

10.3 Correction factors for CABLE

from EMI receiver to test antenna

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.2
20.0	0.2
30.0	0.2
40.0	0.2
50.0	0.3
60.0	0.4
70.0	0.4
80.0	0.4
90.0	0.5
100.0	0.5
150.0	0.6
200.0	0.6
250.0	0.7
300.0	0.8
350.0	0.9
400.0	1.0
450.0	1.1
500.0	1.2
600.0	1.3
700.0	1.4
800.0	1.4
900.0	1.5
1000.0	1.5

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	1.6
1400.0	1.8
1600.0	2.1
1800.0	2.2
2000.0	2.3
2300.0	2.8
2600.0	2.7
2900.0	3.1

NOTES:

1. The cable type is RG-214.

2. The overall length of the cable is 5.5 meters.

10.4 Correction factors for LOG PERIODIC ANTENNA

Type LPD 2010/A
at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. *Antenna serial number is 1038.*
2. *The above lists are located in file number 38M3O.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.*
3. *The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".*

10.5 Correction factors for LOG PERIODIC ANTENNA

Type SAS-200/511 at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4

NOTES:

1. Antenna serial number is 253.

2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.

3. The files mentioned above are located on the disk marked "Antenna Factors".

10.6 Correction factors for BICONICAL ANTENNA

Type BCD-235/B, at 3 meter range

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.

2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

17.8 Correction factors for Double-Ridged Waveguide Horn

Model: 3115
at 1 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)
1.0	25.0
2.0	28.0
3.0	29.0
4.0	33.0
5.0	34.0
6.0	34.9
7.0	36.0
8.0	37.0
9.0	38.0
10.0	39.5
11.0	39.0
12.0	39.5
13.0	40.0
14.0	42.0
15.0	39.8
16.0	38.5
17.0	41.0
18.0	46.5

FREQUENCY (GHz)	ANTENNA Gain (dB)
1.0	5.5
2.0	8.5
3.0	9.0
4.0	9.5
5.0	10.0
6.0	11.0
7.0	10.5
8.0	11.0
9.0	11.5
10.0	12.0
11.0	12.5
12.0	13.0
13.0	12.5
14.0	12.0
15.0	14.0
16.0	15.9
17.0	14.0
18.0	8.5

10.9 Correction factors for BICONICAL ANTENNA

Type 3109,
1.0 meter range

FREQUENCY (MHz)	AFE (dB/m)
20.0	11.1
30.0	12.0
40.0	12.0
50.0	11.4
60.0	10.3
70.0	10.7
80.0	8.3
90.0	9.0
100.0	10.0
110.0	11.6
120.0	13.6
130.0	14.2
140.0	13.5
150.0	12.7
160.0	12.7
170.0	13.6
180.0	15.3
190.0	14.6
200.0	14.7
210.0	15.3
220.0	15.8
230.0	17.0
240.0	18.0
250.0	18.1
260.0	18.0
270.0	17.5
280.0	18.2
290.0	19.7
300.0	21.8

NOTES:

1. Antenna serial number is 3244.

2. The above list is located in file 44BIC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver"