

EMC EMISSION - TEST REPORT

UNITED STATES STANDARD 47 CFR PART 15, SUBPART B

Test Report File No. : **9392-06** Date of Issue: 11 August 1999

Model / Serial No. : 473 / ----

Product Type : Long Range Transmitter

Applicant : DIRECTED ELECTRONICS, INC.

Manufacturer : DIRECTED ELECTRONICS, INC.

License holder : DIRECTED ELECTRONICS, INC.

Address : 2560 Progress Street
: Vista, CA 92083

Test Result : **Positive** **Negative**

Test Project Number
Reference(s) : 9392-06

Total pages - Test Report : 9

NOTE: All test equipment used during testing is calibrated and traceable to NIST.

TÜV Product Service reports apply only to the specific sample tested under stated test conditions. It is the manufacturer's responsibility to assure the continued compliance of production units of this model. TÜV Product Service, Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service, Inc. issued reports.

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Test Report**

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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

- EN 50081-1 / 1991
- EN 55011 / 1991 - Group 1 - Group 2
- EN 55013 / 1990 - Class A - Class B
- EN 55014 / 1987 - Household appliances and similar
- EN 55014 / 1987 - Portable tools
- EN 55014 / 1987 - Semiconductor devices
- EN 55014 / A2:1990
- EN 55014 / 1993 - Household appliances and similar
- EN 55014 / 1993 - Portable tools
- EN 55014 / 1993 - Semiconductor devices
- EN 55015 / 1987
- EN 55015 / A1:1990
- EN 55015 / 1993
- EN 55022 / 1987 - Class A - Class B
- EN 55022 / 1998 - Class A - Class B
- BS
- VCCI - Class A ITE - Class B ITE
- 47 CFR Part 15, Subpart B
 - 107(b)
 - 107(a)
 - 107(e) - Class A - Class B
 - 109(b)
 - 109(a)
 - 109(g) - Class A - Class B
 - 231(b)
- AS/NZS 3548: 1995 - Class A - Class B
- CISPR 11 (1990) - Group 1 - Group 2
- CISPR 11 (1990) - Class A - Class B
- CISPR 22 (1998) - Class A - Class B

Environmental Conditions In The Laboratory:

	<u>Actual</u>
Temperature:	: 23 °C
Relative Humidity:	: 50 %
Atmospheric Pressure:	: 100.0 kPa

Power Supply Utilized:

Power supply system : 12 Vdc

Symbol Definitions:

- - Applicable
- - Not Applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

■ - Test not performed - see remarks

- SR-2, Shielded Room, 12' x 24' x 10', Metal Chamber
- SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber
- SR-4, Shielded Room, 20' x 28' x 16', Metal, Anechoic Chamber
- SR-5, Shielded Room, 16' x 28' x 15', Metal, Semi-Anechoic Chamber
- CSR-1, Shielded Room, 10' x 7' x 7', Metal Chamber

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Due Date
NM-7A, NM-17/27, NM-37/57, NM-67, CCA-7, & H/P 9836 HP-1B Computer	156, 162-166	Automated RFI Measurement System (ARMS), NO. 1	Eaton/Ailtech	(multiple)	
LISN-3, 50 A	262-263	Power Mains Network (LISN), 50 μH/250 μH/50 Ω/0.25 μF	Fischer Custom Communications, Inc.	3-4	
LISN-2, 25 A	--	Power Mains Network (LISN), 50 μH/250 μH/50 Ω/0.25 μF	Fischer Custom Communications, Inc.	7	
FCC-LISN-50-25-2	553	Power Mains Network (LISN), 50 μH/250 μH/50 Ω/0.25 μF	Fischer Custom Communications, Inc.	112	
FCC-LISN-50-25-2	552	Power Mains Network (LISN), 50 μH/250 μH/50 Ω/0.25 μF	Fischer Custom Communications, Inc.	113	
8012-50-R-12-BNC	266	LISN, 50 μH/50 Ω/0.1 μF	Solar Electronics Co.	--	
9252-50-R-24-BNC	458	LISN, 50 μH /250 μH/50 Ω/ 0.25 μF	Solar Electronics Co.	941719	
9252-50-R-24-BNC	457	LISN, 50 μH /250 μH/50 Ω/ 0.25 μF	Solar Electronics Co.	941720	
CAT-20	598	20 dB Attenuator	Mini-Circuits	--	
CAT-20	615	20 dB Attenuator	Mini-Circuits	--	

Remarks: EUT battery operated.

One year calibration cycle for all test equipment.

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements were tested in a horizontal and vertical polarization at the following test location :

■ - Test not performed - see remarks

- - Roof (Small Open Area Test Site) (Calibration Due Date: 28 May 2000)
- Canyon #1 (10- and 30-Meter Open Area Test Site), Carroll Canyon, San Diego (Calibration Due Date: 21 July 1999)
- Canyon #2 (3- and 10-Meter Open Area Test Site), Carroll Canyon, San Diego (Calibration Due Date: 20 May 2000)

Testing was performed at a test distance of :

- - 3 meters
- 10 meters
- 30 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3115	453	Antenna, Double Ridge Guide	EMCO	9412-4363	10/99
3146	418	Antenna, Log Periodic Dipole	EMCO	9402-3775	06/99
8566B	720	Spectrum Analyzer	Hewlett Packard	211500842	03/00
8566B	721	Spectrum Analyzer Display	Hewlett Packard	2112A02185	03/00

Remarks: Pre-scan in shielded room detected no measurable emissions from 30 - 1000 MHz except fundamental and harmonics of the fundamental.

One year calibration cycle for all test equipment.

Equipment Under Test (EUT) Test Operation Mode - Emissions Tests :

The equipment under test was operated under the following conditions during emissions testing:

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Practice Operation
- Normal Operating Mode
- Continuous transmit

Configuration of the equipment under test:

- See Constructional Data Form in Appendix B - Page B2
- See Product Information Form(s) in Appendix B - Page B2

The following peripheral devices and interface cables were connected during the testing:

- | | |
|---|----------------|
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - unshielded power cable | |
| <input type="checkbox"/> - unshielded cables | |
| <input type="checkbox"/> - shielded cables | MPS.No.: _____ |
| <input type="checkbox"/> - customer specific cables | |
| <input type="checkbox"/> - _____ | |
| <input type="checkbox"/> - _____ | |

GENERAL REMARKS:

NOTE: All photographs are representative of setup for maximum emissions.

(*) Conducted Emissions - EUT battery operated.

Radiated Emissions - Pre-scan in shielded room detected no measurable emissions from 30 - 1000 MHz except fundamental and harmonics of the fundamental.

SUMMARY:

All tests according to the regulations cited on page 3 were

- Performed

- **Not Performed***

The Equipment Under Test

- **Fulfills** the general approval requirements cited on page 3.

- **Does not** fulfill the general approval requirements cited on page 3.

Statement of Measurement Uncertainty

The data and results referenced in this document are true and accurate. The measurement uncertainty is calculated to be ± 2 dB for conducted emissions and ± 4 dB for radiated emissions.

Equipment Received Date: 10 August 1999

Testing Start Date: 10 August 1999

Testing End Date: 10 August 1999

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Dave Marshall
(EMC Test Engineer)

Responsible Engineer:



Mary Washington
(EMC Engineer)

Technical Documentation

Test Data Sheets

and

Test Setup Drawing(s)

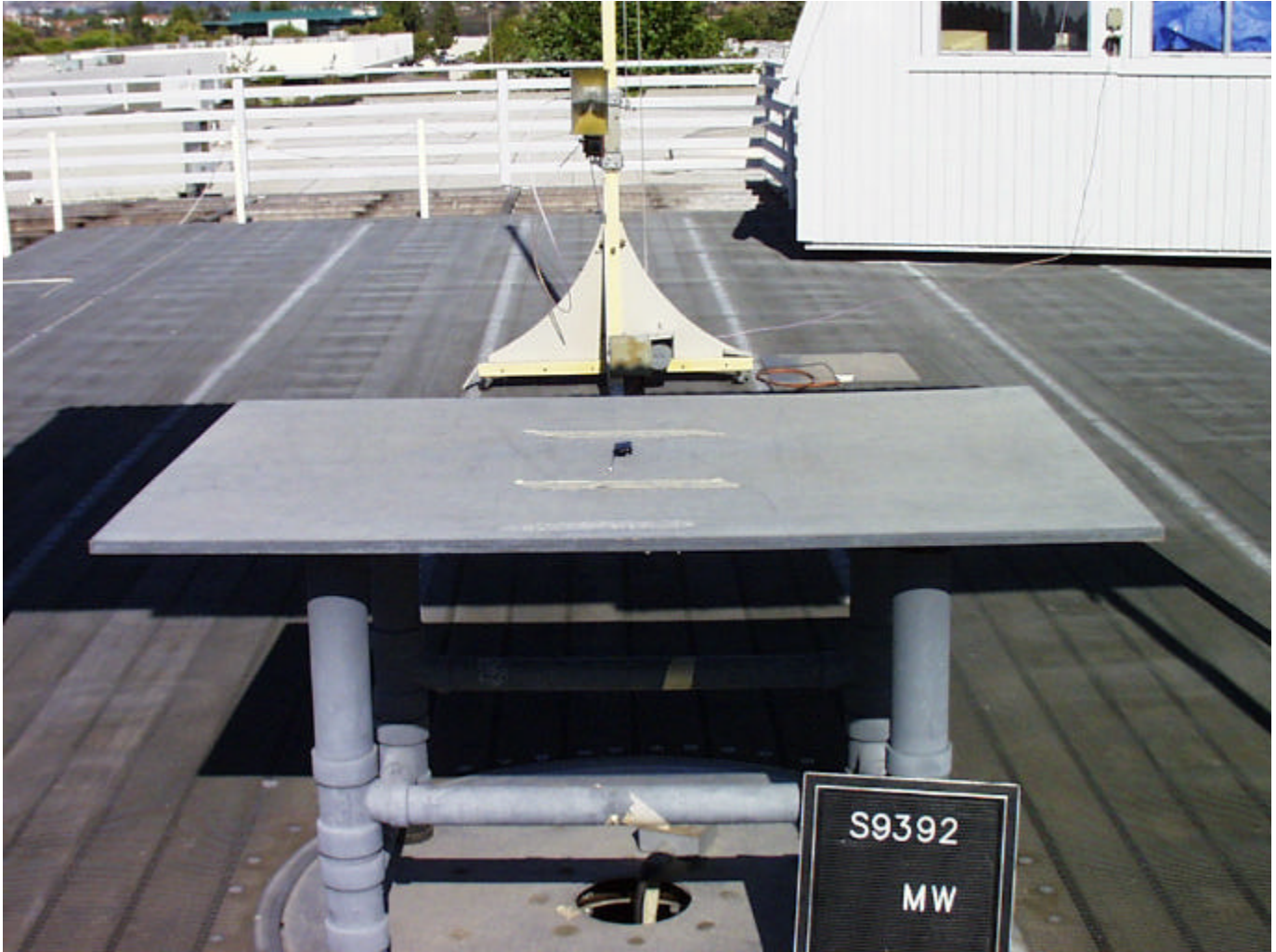
(See photograph for test setup.)

Appendix A

Test Setups (Photographs)

NOTE: All photographs are representative of setup for maximum emissions.

Photograph of Test Setup:
Radiated Emissions



Photograph of Test Setup:
Radiated Emissions



Appendix B

Product Information Form(s)

Electromagnetic Compatibility (EMC) Test Plan

Date: 8/2/99

Company: Directed Electronics, Inc. Contact: Tyson Mackjust
Address: 2560 Progress Street Phone: 760-599-1334
City: Vista FAX: 760-599-1380
Zip: 92083 E-mail: tyson@directed.com

****EUT Name: Long Range Transmitter**

****Model: 473 S/N:n/a**

Test Objective:

EMC Directive 89/336/EEC (EMC Requirements)
Machinery Directive 89/362/EEC (EMC Requirements)
Medical Device Directive 93/42/EEC (EMC Requirements)
xxxxFCC Part 15.231 (list)
Other (please specify)

Test will be,

Attended by the customer.
xxxxx Unattended by the customer.

If a failure occurs, TÜV Product Service should,

xxxxx Call contact list above, if not available then stop testing.
Continue testing to complete test series.
Continue testing to define corrective action.
Stop testing.

Customer authorization to perform tests according to this test plan.

XTyson Mackjust Date: 8/2/99

Test plan prepared by:

xTyson Mackjust Date: 8/2/99
(Please Print)

Test plan reviewed by:

xMartin Gonzalez Date: 8/2/99

() PLEASE NOTE: Information in this box will be the information in your test reports.**

Electromagnetic Compatibility (EMC) Test Plan

1.0 EUT Documentation

This section provides the necessary documentation for detailing the Equipment Under Test (EUT). Descriptions of the equipment including software and documentation on installation and operations should be provided.

Additional documentation necessary for test plan completion should be attached to the back of the test plan. For additional instruction on how to complete your test plan contact your TÜV Product Service representative.

1.1 EUT Description: Long Range Security Remote Control Transmitter for use in Automotive Security Systems.

1.1.1 Components of EUT

(List each one separately. Add attachment if necessary. NOT TO INCLUDE PERIPHERALS.)

Description	Model Number	Serial Number	FCC ID Number
Long Range Transmitter	473	n/a	EZSDEI473
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a

1.2 Operating modes: (list and describe)

Manually operated by operator by pressing one of the momentary switches. Transmission deactivates within 5 seconds of being released. Transmission automatically concludes after 15 seconds if transmitter button is held on. Transmitter will be configured to transmit continuously for testing purposes only.

Electromagnetic Compatibility (EMC) Test Plan

1.3 EUT I/O Ports and Cables:

1.3.1 I/O Cables (Add attachment if necessary.)

CONNECTION:	n/a
SHIELD:	n/a
CONNECTORS:	n/a
TERMINATION TYPE:	n/a
LENGTH:	n/a
REMOVABLE:	n/a
<hr/>	
CONNECTION:	n/a
SHIELD:	n/a
CONNECTORS:	n/a
TERMINATION TYPE:	n/a
LENGTH:	n/a
REMOVABLE:	n/a
<hr/>	
CONNECTION:	n/a
SHIELD:	n/a
CONNECTORS:	n/a
TERMINATION TYPE:	n/a
LENGTH:	n/a
REMOVABLE:	n/a
<hr/>	
CONNECTION:	n/a
SHIELD:	n/a
CONNECTORS:	n/a
TERMINATION TYPE:	n/a
LENGTH:	n/a
REMOVABLE:	n/a

Electromagnetic Compatibility (EMC) Test Plan

1.3.2 Power Cords (Add attachment if necessary.)

UNIT:	n/a
MANUFACTURER:	n/a
SHIELDED:	n/a
LENGTH:	n/a

UNIT:	n/a
MANUFACTURER:	n/a
SHIELDED:	n/a
LENGTH:	n/a

UNIT:	n/a
MANUFACTURER:	n/a
SHIELDED:	n/a
LENGTH:	n/a

1.3.3 Power requirements:

***Note:** European power is typically 230 VAC 50Hz or 400 VAC 50Hz, single and three phase, respectively. FCC requires testing to be performed at typical US power ratings at 60Hz.

230 VAC 50Hz – single phase	Amps
400 VAC 50Hz – three phase	Amps per phase
120 VAC 60Hz – single phase	Amps
VDC	Amps
Battery: 12 VDC Expected life: 15 Hours	
Other:	(describe)

Electromagnetic Compatibility (EMC) Test Plan

1.4 Oscillator Frequencies

Frequency	EUT Location	Description of use
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a

1.5 Power Supply

Description	Manufacturer	Model #	Serial #	Switching frequency or linear
n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a

1.6 Power Line Filters

Manufacturer	Model #	Qty	LOCATION ON EUT
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a

1.7 Critical EMI Components (Capacitors, ferrites, etc.)

Description	Manufacturer	Part # or value	Qty	LOCATION ON EUT
n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a

1.8 Description of Enclosure: (Including Gasketing, Coatings, Bonding, etc.)

n/a

Electromagnetic Compatibility (EMC) Test Plan

1.9 Interfacing and/or Simulators Peripheral Equipment

(Please provide a complete description of all peripherals to be used during testing, please note that all I/O ports must be appropriately loaded)

DESCRIPTION:	n/a
MANUFACTURER:	n/a
MODEL NUMBER:	n/a
SERIAL NUMBER:	n/a
FCC ID:	n/a

DESCRIPTION:	n/a
MANUFACTURER:	n/a
MODEL NUMBER:	n/a
SERIAL NUMBER:	n/a
FCC ID:	n/a

DESCRIPTION:	n/a
MANUFACTURER:	n/a
MODEL NUMBER:	n/a
SERIAL NUMBER:	n/a
FCC ID:	n/a

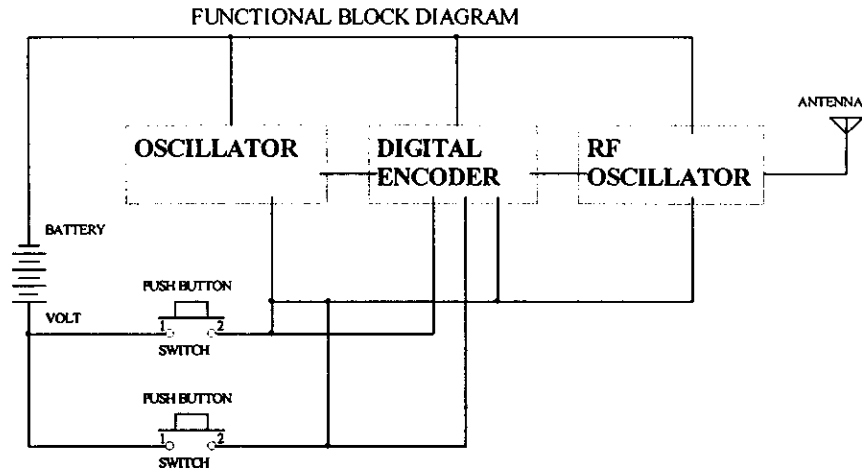
DESCRIPTION:	n/a
MANUFACTURER:	n/a
MODEL NUMBER:	n/a
SERIAL NUMBER:	n/a
FCC ID:	n/a

DESCRIPTION:	n/a
MANUFACTURER:	n/a
MODEL NUMBER:	n/a
SERIAL NUMBER:	n/a
FCC ID:	n/a

Electromagnetic Compatibility (EMC) Test Plan

1.10 System Configuration Block Diagram

Use Word Draw or another draw program to draw the block diagram.



Appendix C

Change History

Not Applicable

Appendix D

Supplemental Information

Not Applicable