

TEST REPORT



Certification # 1367-01

Laboratory ID

PRODUCT SAFETY ENGINEERING, INC.
12955 Bellamy Brothers Boulevard
Dade City, Florida 33525 USA
PH (352) 588-2209 FX (352) 588-2544

Report Issue Date: 11 Jul 03

Sample S/N: None

Sample Receipt Date: May 02, 2003

Sample Test Date: see data sheets

Submitter ID

WorldWide Widget Works
7024 Creek Place Drive

Killeen, TX 76549

Test Report Number: 03F261B

Model Designation: TracBack

Product Description: 1.637 MHz
Transmitter

Marketing Approval

Description of non-standard test method or test practice: *None*

Estimated Measurement Uncertainty: *Not Applicable*

Special limitations of use: *None*

Traceability: *reference standards of measurement have been calibrated by a competent body using standards traceable to the NIST.*

According to testing performed at Product Safety Engineering, Inc., the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in regulations indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Engineer, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature

Name David Foerstner

Title Engineering Group Leader

Date 11 Jul 03

Reviewed by:

Approved Signatory

A handwritten signature in black ink that appears to read 'John E. Hahn'.

Date 11 Jul 03

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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- EN 50081-1 : 1992
- EN 50081-2 : 1995
-
- EN 55011 : 1998 / A1:1999 - Group 1 - Group 2
- Class A - Class B
-
- EN 55013 : 1990 / A12:1994 / A13:1996 / A14:1999
-
- EN 55014 : 1993 /A1:1997 - Household appliances and similar
- Portable tools
- Semiconductor devices
-
- EN 55022 : 1998 - Class A - Class B
-
- AS/NZS 3548:1995 - Class A - Class B
-
- ICES-003 - Class A - Class B
-
- CNS 13438 - Class A - Class B
-
- VCCI : 1999 - Class A - Class B
-
- FCC Part 15 - Class A - Class B
-
- Certification
- Verification
- Declaration of Conformity
-
- FCC Part 18

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Environmental conditions during testing:

	LAB	OATS
Temperature: *	_____	_____
Relative Humidity: **	_____	_____
Power supply system	: <u>9</u> Volts <u>DC</u> Hz <u>INTERNAL BATTERY</u>	

Sign Explanations:

- not applicable
- applicable

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Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

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

- Test not applicable

- Darby Test Site (Open Area Test Site)
- Darby Laboratory

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - 8028-50	Solar	50 Ω LISN	829012, 829022
□ - 3825/2	Solar	50 Ω LISN	924840
□ - EMC-30	Electro-Metrics	EMI Receiver	191
□ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - 85662A	Hewlett Packard	Analyzer Display	2403A07352
□ - 8028-50	Solar	50 Ω LISN	903725, 903726
□ - FCC-TLISN-T4	Fisher Custom Com.	Telecom ISN	20072

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The **RADIATED EMISSIONS (MAGNETIC FIELD)** measurements were performed at the following test location:

- Darby Test Site (Open Area Test Site)
-
-

at a test distance of :

- 3 meters
- 30 meters

- Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - 96005	Eaton	Log Periodic Antenna	1099
□ - BIA-25	Electro-Metrics	Biconical Antenna	4283
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - ALR-30M	Electro-Metrics	Loop Antenna	824
□ - 8447D	Hewlett Packard	Preamplifier	2944A06832
□ - EMC-30	Electro-Metrics	EMI Receiver	191
■ - ALA-130/A	Antenna Research	Loop Antenna	106

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Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The **RADIATED EMISSIONS (ELECTRIC FIELD)** measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Test not applicable

- Darby Site (Open Area Test Site)
- Darby Lab
-

at a test distance of :

- 3 meters
- 10 meters
- 30 meters

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
■ - 96005	Eaton	Log Periodic Antenna	1099
■ - BIA-25	Electro-Metrics	Biconical Antenna	4283
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
■ - 8447D	Hewlett-Packard	Preamplifier (26dB)	2944A06832
□ - EMC-30	Electro-Metrics	EMI Receiver	191
□ - 8568B	Hewlett Packard	Spectrum Analyzer	2407A03213
□ - 85650A	Hewlett Packard	Quasi-Peak Adapter	2043A00358
□ - 85662A	Hewlett Packard	Analyzer Display	2340A05806
□ - LPA30	Electro-Metrics	Log Periodic	2280
□ - BIA 30	Electro-Metrics	Biconical Antenna	3852

Emissions Test Conditions): INTERFERENCE POWER

The **INTERFERENCE POWER** measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

- Test not applicable

- Darby Lab
-

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - MDS-21	Rhode&Schwarz	Absorbing Clamp	8608447020
□ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
□ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - 8447D	Hewlett-Packard	Amplifier (26 dB)	2944A06832
□ - EMC-30	Electro-Metrics	EMI Receiver	191

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The **EQUIVALENT RADIATED EMISSIONS** measurements in the frequency range **GHz - GHz** were performed in a horizontal and vertical polarization at the following test location :

- Darby Test Site (Open Area Test Site)
-
-
-

at a test distance of:

- 1 meters
- 3 meters
- 10 meters

- Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
□ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - 8449B	Hewlett-Packard	Preamplifier	3008A00320
□ - 3115	Electro-Mechanics	Double Ridge Guide Horn	3810

The **ANTENNA TERMINAL DISTURBANCE VOLTAGE** in the frequency range **30 MHz - 1,000 MHz** were performed.

- Darby Test Site (Open Area Test Site)
- Laboratory
-
-

- Test not applicable

Model Number	Manufacturer	Description	Serial Number
□ - 2F9-3C4-3C5	Wavecom	UHF PAL TV Modulator	185879
□ - 2F1-3C4-3C5	Wavecom	VHF PAL TV Modulator	157728
□ - A-8000	IFR	Spectrum Analyzer	1306
□ - 8648B	Hewlett-Packard	Signal Generator	3623A01433
□ - 8648B	Hewlett-Packard	Signal Generator	3623A01477
□ - LMV-182A	Leader	RMS Milli-Voltmeter	8010091
□ - 3202	Krhon-Hite	Active filter	5899
□ - FMT115	Leaming	FM Modulator	NONE
□ - 371	UDT	Optical power meter	06657
□ - TSG95	Tektronix	PAL video / Audio generator	B028883
□ -			

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Equipment Under Test (EUT) Test Operation Mode - Emission tests :

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

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- Normal Operating Mode
-

Configuration of the device under test:

- See System Under Test Information in Appendix B

Rationale for EUT setup / configuration:

ANSI C63.4, FCC PART 15.209, Part 15.219

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Emission Test Results:

FCC Part 15 section 15.219 Total Input Power

The requirements are - MET - NOT MET
Minimum limit margin **19.0** mW

Remarks: Total input power to final radio frequency stage shall not exceed 100 milliwatts

Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are - MET - NOT MET
Minimum limit margin **6.6** dB at **9.82** MHz
Remarks:

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are - MET - NOT MET
Minimum limit margin **26.6** dB at **33.0** MHz
Remarks:

Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are **Per FCC Part 15.219** - MET - NOT MET
Minimum limit margin dB at MHz
Remarks:

Radiated emissions GHz - GHz

The requirements are - MET - NOT MET
Minimum limit margin dB at GHz
Remarks:

Antenna Terminal Disturbance Voltage 30 MHz - 1,000 MHz

The requirements are - MET - NOT MET
Minimum limit margin dB at MHz
Remarks:

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GENERAL REMARKS:

Radiated limits used were taken from FCC Part 15.219.

Limits were adjusted to 3 meter distance using FCC Part 15.31 (f) (2)

The EUT was tested in (3) orthogonal positions.

The value of "R37" was changed from (100) ohms to (22) ohms prior to testing.

SUMMARY:

The requirements according to the technical regulations are

- met

- **not** met.

The device under test does

- fulfill the general approval requirements mentioned on page 3.

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

Testing Start Date May 16, 2003

Testing End Date: June 23, 2003

- PRODUCT SAFETY ENGINEERING INC -

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Test-setup photo(s):

Conducted emission 450/150 kHz - 30 MHz

N/A

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Test-setup photo(s):
Radiated emission 1.6 MHz - 1000 MHz



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APPENDIX

A

Test Equipment Calibration Information

&

Test Data Sheets

TEST EQUIPMENT CALIBRATION INFORMATION

Manufacturer	Model	Description	Serial Number	Cal Due
Hewlett Packard	8566B	Spectrum Analyzer	2421A00526	08/22/03
Hewlett Packard	85662A	Display	2403A07352	08/22/03
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00209	08/22/03
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06832	11/13/03
Hewlett Packard	8568B	Spectrum Analyzer	2407A03213	08/22/03
Hewlett Packard	85662A	Display	2340A05806	08/22/03
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00358	08/22/03
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06901	08/02/03
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	1937A03247	07/19/03
Hewlett Packard	8449B	Preamp 1 - 26.5 GHz	3008A00320	11/08/03
Hewlett Packard	8648B	Signal Generator	3443U00312	04/25/03
Hewlett Packard	8672A	Signal Generator	2211A02426	11/14/03
Eaton	96005	Log Periodic Antenna	1099	01/24/04
Electro-Metrics	LPA 30	Log Periodic Antenna	2280	12/06/03
Electro-Metrics	BIA 30	Biconical Antenna	3852	12/05/03
Electro-Metrics	BIA 25	Biconical Antenna	4283	01/22/04
Electro-Mechanics	3115	Double Ridge Guide Ant.	3810	11/07/03
Electro-Metrics	ALR30M	Magnetic Loop Antenna	824	12/12/03
Solar	8012	LISN	924840	12/29/03
Solar	8028	LISN	829012/809022	12/19/03
Solar	8028	LISN	903725/903726	11/18/03
Schwartzbeck	MDS-21	Absorbing Clamp	02581	09/13/03
Leader	LFG1310	Function Generator	8060233	04/23/03
Holaday Ind.	HI 4422	Isotropic Probe	90310	05/22/03
IFR Systems	A-8000	Spectrum Analyzer	1306	11/13/03
Fischer Custom	F-33-1	RF Current Probe	360	11/20/03
Electro-Metrics	EMC-30	EMI Receiver	191	04/24/04
Boonton	4220A	RF Power Meter	204103AA	11/08/03
Boonton	51011	RF Power Meter	28823	11/08/03
Antenna Research	ALA-130/A	Loop Antenna	106	03/14/04

PRODUCT EMISSIONS

PRODUCT SAFETY ENGINEERING

PRODUCT SAFETY ENGINEERING

Data File: TRACBACK FCC-B BIC 5-16-2003

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS			SITE		CORR FACTOR dB	COMMENTS
			ABS	dLIM	MODE	POL	HGT cm		
1	33.04	40.0	13.4	-26.6	PK	V	100	90	
2	51.20	40.0	11.2	-28.8	PK	V	100	90	
3	62.59	40.0	13.1	-26.9	PK	V	100	270	
4	122.29	43.5	15.1	-28.4	PK	V	100	180	
5	214.91	43.5	13.8	-29.7	PK	V	100	225	
6	216.22	46.0	3.7	-42.3	PK	V	100	315	
7	444.85	46.0	19.4	-26.6	PK	V	100	225	

A3

World Wide Widget

Intentional Radiator Emissions

Measured @ 3 Meters

Frequency (MHz)	Spec Limit (dB μ V/M)	ACF	CL	Measurement (dB μ V/M)	Δ Limit
1.637	63.3	-8.2	0.5	52.5	-10.8
3.274	32.5	-10.3	0.5	24.2	-8.3
4.911	32.5	-9.2	0.5	22.6	-9.9
6.548	32.5	-7.8	0.5	24.0	-8.5
8.185	32.5	-6.4	0.5	24.2	-8.3
9.822	32.5	-4.6	0.5	25.9	-6.6
11.459	32.5	-3.7	0.5	24.6	-7.9
13.096	32.5	-2.4	0.5	24.8	-7.7
14.733	32.5	-1.0	0.5	24.6	-7.9
16.370	32.5	-0.7	0.5	22.2	-10.3

Total Input Power & Harmonics

Total Input Power to final Radio Frequency Stage per FCC Part 15.219 was measured to be 81.0 mW which is 19 mW below the allowable 100 mW limit. We then measured the field strength of the fundamental and found it to be (52.5) dB μ V/m at (3) meters. This amplitude is below the limit stated in the general radiated emissions (15.209). Once the field strength of the fundamental was established, the harmonics were each measured and compared to a limit which was set at (20) dB below the measured fundamental level.

Magnetic loop antenna is active and includes a preamplifier.

APPENDIX

B

System Under Test Description

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SYSTEM COMPONENTS

DEVICE TYPE: EUT, WORLD WIDE WIDGET TRACBACK

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INTERFACE CABLES

DEVICE TYPE: EUT **NONE**
SHIELD:
LENGTH:
CONNECTOR TYPE:
PORT:

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AC LINE CORDS

DEVICE TYPE: EUT **NONE**
SHIELD:
LENGTH:
CONNECTOR TYPE:

APPENDIX

C

Measurement Protocol

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The test methodology followed during the collection of the data included within this technical report was ANSI C63.4:1992.

The EUT was powered with (120) VAC / (60) Hz during the collection of data included within.

The data is compared to the FCC Part 15 Class B limits.

The "EMI" instrumentation is capable of calculating the final emission level based on the following formula:

Level at the receiver (dB μ V) + Antenna Correction Factor (dB/M) + Cable Loss (dB) - Preamp Gain (dB) = Actual Level in dB μ V/M.

The sample calculation below is based on the actual test data collected:

Observed Level	39.9	dB μ V
ACF	+	12.0 dB/M
Cable Loss	+	0.7 dB
Preamp Gain	-	<u>26.0</u> dB
Actual Level		26.6 dB μ V/M @ 33.0 MHz

Please have a company official review this report and sign.