



Engineering and Testing for EMC and Safety Compliance



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FCC Certification Report

BriarTek, Inc.
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MODEL: ORCA TX104

FCC ID: QJYORCA1

May 1, 2008

Standards Referenced for this Report	
Part 2: 2007	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 80: 2007	Stations in the Maritime Services
ANSI TIA-603-C-2004	Land Portable FM or PM Communications Equipment - Measurement and Performance Standards

Frequency Range (MHz)	Rated Conducted Power (W)	Frequency Tolerance (ppm)	Emission Designator
121.5	0.1	0.005%	8K50F3E

Report Prepared by: Richard B. McMurray, P.E.

Document Number: 2008083

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1 General Information

This Certification Report is prepared on behalf of **BriarTek, Inc.** in accordance with the Federal Communications Commission Rules and Regulations. The Equipment Under Test (EUT) was the **ORCA TX104, FCC ID: QJYORCA1**.

The BriarTek, Inc. "ORCA" is a low power Personal Locator Beacon intended to be attached to a Personal Flotation Device, and used as an automatic alert in a man-overboard occurrence and to locate personnel swept overboard in the event that he/she can no longer be tracked visually.

The device is to be used to quickly rescue personnel in close proximity of a vessel; it is water-activated and signals a receiver installation on the vessel's bridge to allow local search and rescue.

The FCC granted a waiver (DA 02-287) for the ORCA (please see the waiver exhibit uploaded with this application) that waives the requirements of 47 CFR Paragraphs 80.1053(a)(4) through (7), (a)(a4), (e) and 80.1055(a)(3), 80.1055(a)(4) and 80.1055(a)(3)(4).

The ORCA transmits on 121.5 MHz with a rated power of 100 mW using FM modulation to transmit a time and unit identifier.

All measurements contained in this application were conducted in accordance with FCC Rules and Regulations CFR 47. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

1.2 Related Submittal(s)/Grant(s)

This is an original application report.

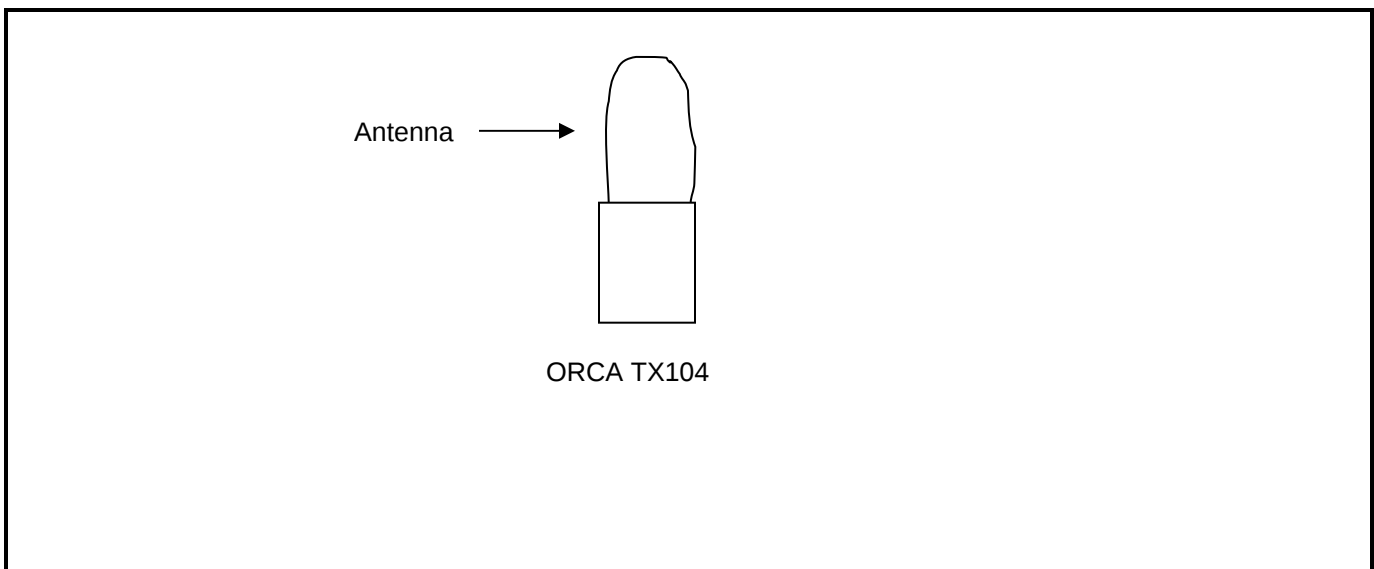
2 Tested System Details

The test sample was received on April 21, 2008. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this testing, as applicable.

Table 2-1: Equipment under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
Personal Locator Beacon	BriarTek, Inc.	ORCA TX104	7032-039	QJYORCA1	18396

Figure 2-1: Configuration of Tested System



3 FCC Rules and Regulations Part 2 §2.1046(a): RF Conducted Power Output; Output Power Test

3.1 Test Procedure

ANSI TIA-603-C-2004, section 2.2.1

3.2 Test Data

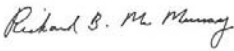
Table 3-1: RF Power Output - Conducted

Frequency (MHz)	Power (W)
121.5	0.1

Table 3-2: Test Equipment for RF Power Output - Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	6/14/2008

Test Personnel:

Richard B. McMurray, P.E.		April 24, 2008
Test Engineer	Signature	Date of Test

4 FCC Rules and Regulations Part 2 §2.1053(a): Field Strength of Spurious Radiation

4.1 Test Procedure

ANSI TIA-603-C-2004, Section 2.2.12

The spurious emissions levels were measured at 3 meters and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna was further corrected to a half wave dipole.

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

where:

P_d is the dipole equivalent power

P_g is the generator output power into the substitution antenna

4.2 Test Data

Table 4-1: Field Strength of Spurious Radiation

Frequency (MHz)	Polarity (H/V)	Spectrum Analyzer Level (dBμV)	Spectrum Analyzer (dBm)	Cable Loss (dB)	notch filter	PreAmp	Antenna Factor (dB)	Corrected data (dBμV/m)	Field Intensity μV/m @ 3m	dBc
121.510	V	95.4	-11.6	1.5	0.0	0.0	12.7	109.6	301995.2	0
243.000	V	76.8	-30.2	2.0	0.8	-39.3	12.5	52.8	436.5	-56.8
364.500	H	55.9	-51.1	2.6	0.9	-38.2	15.8	37.0	70.8	-72.6
486.000	H	51.5	-55.5	3.0	0.8	-37.6	17.9	35.6	60.3	-74.0
607.512	H	67.2	-39.8	3.3	0.8	-37.2	19.4	53.5	473.2	-56.1
729.012	H	49.8	-57.2	3.6	0.7	-36.9	20.0	37.2	72.4	-72.4
850.516	H	47.0	-60.0	3.8	1.1	-35.9	21.4	37.4	74.1	-72.2
972.016	V	45.3	-61.7	4.2	1.6	-35.6	22.3	37.8	77.6	-71.8
1093.518	H	49.6	-57.4	4.5	4.2	-35.4	23.0	45.9	197.2	-63.7
1215.022	H	42.0	-65.0	4.8	6.2	-35.4	24.3	41.9	124.5	-67.7

Table 4-2: Test Equipment for Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	12/20/08
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridges Guide Antenna (1 - 18 GHz)	2310	03/30/09
901215	Hewlett Packard	8596EM	EMC Analyzer (9 kHz – 12.8 GHz)	3826A00144	10/17/08
901281	Rhein Tech Laboratories	PR-1040	Amplifier (10 MHz - 2 GHz)	1004	1/19/2009
901131	Par Electronics	118-174	VHF Notch Filter, 118-174 MHz, 25W	NA	2/1/2009
901422	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	10/5/2008
901158	Compliance Design, Inc.	Roberts Dipole Antenna	Adjustable Elements Dipole 25-1000 MHz Antennas	00401	2/4/2009

Test Personnel:

Rick McLay		April 22, 2008
Test Engineer	Signature	Date of Test

5 FCC Rules and Regulations Part 2 §2.1049: Occupied Bandwidth

5.1 Test Procedure

5.2 Test Data

Plot 5-1: Occupied Bandwidth

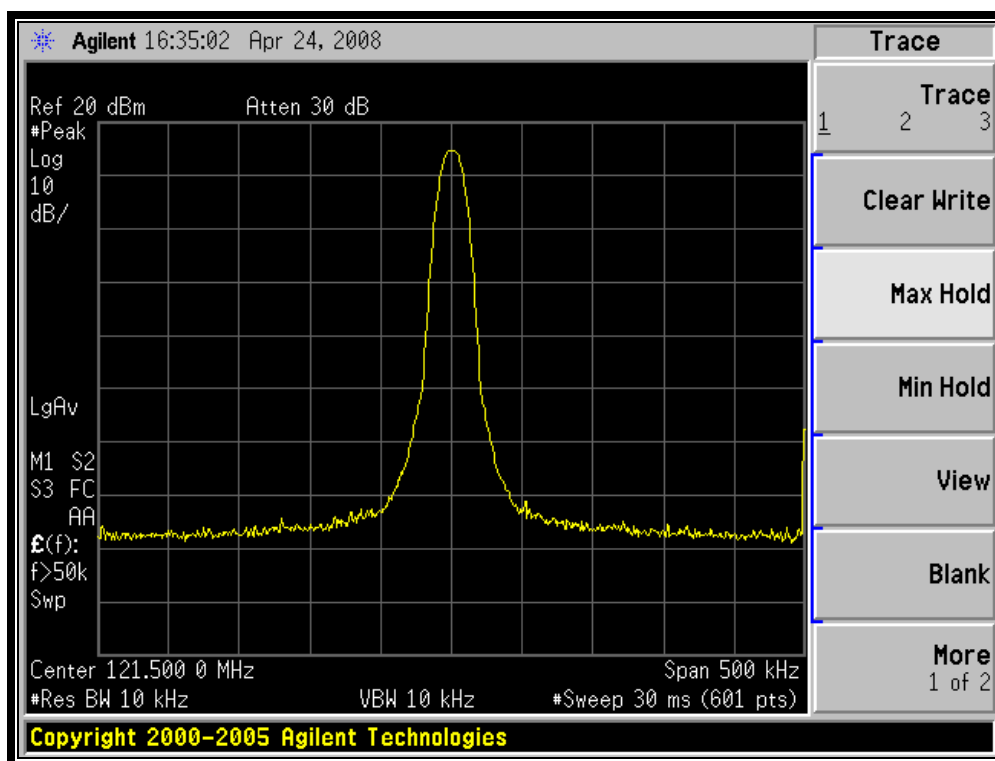


Table 5-1: Test Equipment for Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	6/14/2008

Test Personnel:

Richard B. McMurray, P.E.	<i>Richard B. McMurray</i>	April 24, 2008
Test Engineer	Signature	Date of Test