

RETLIF TESTING LABORATORIES  
TEST REPORT R-4719N  
March 28, 2007

FCC PART 15 COMPLIANCE TEST REPORT  
ON

ORTOVOX  
S1 AVALANCHE TRANSCEIVER  
FCC ID: KF5ORTOVOXS1

APPLICANT	MANUFACTURER
Ortovox Sportartikel Rotwandweg 5 D-82024 Taufkirchen Germany	Same

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.209

TEST PROCEDURE: ANSI C63.4:2003

**TEST SAMPLE DESCRIPTION:**

BRANDNAME: Ortovox

MODEL: S1

TYPE: Avalanche Transceiver

POWER REQUIREMENTS: 3VDC Internal Battery

FREQUENCY OF OPERATION: 457kHz

MODULATION: Pulsed

APPLICATION: To Locate Avalanche Victims

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**TESTS PERFORMED:**

15.209 Fundamental & Spurious Radiated Emissions (450kHz to 1000MHz)

**TEST SAMPLE OPERATION:**

The Ortovox D3 Avalanche Transceiver is used to locate avalanche victims. It is manually activated by the user and in transmit mode will continuously transmit at 457kHz. During testing the EUT was continuously transmitting at 457kHz with new batteries installed.

## TEST SAMPLE / TEST PROGRAM

- 15.203 Antenna Requirements - The device uses a permanently attached internal ferrite antenna. The antenna is totally enclosed inside the case.
- 15.205 Restricted Bands - No emissions were observed from the EUT in any restricted bands.
- 15.207 Conducted Emissions - Not applicable (battery operated device)
- 15.209 Radiated Emissions - Fundamental Frequency .457MHz, Harmonic/Spurious Emissions 450kHz to 1000MHz
- The peak value of fundamental emissions did not exceed a peak field strength limit corresponding to 20dB above the maximum permitted average limit.
- No harmonic or spurious emissions were observed within 20dB of the specified limit at test distances of 1 or 3 meters.
- Radiated Emissions from the EUT were measured in all three axis. The attached Radiated Emissions test data shows the maximized fundamental emission of each orientation.

## DETERMINATION OF FIELD STRENGTH LIMITS

The field strength limits shown below were calculated as instructed in Section 15.209.

### Fundamental Frequency: 457kHz

Where F is the frequency in kHz, the formula for calculating the maximum permitted fundamental field strength at 300 Meters is:

$$\begin{aligned} 2400/(F) &= \text{Field Strength Limit } (\mu\text{V/m}) \\ 2400/(457) &= 5.25\mu\text{V/M} \\ \text{Field Strength Limit} &= 14.4\text{dBuV/M} \end{aligned}$$

The maximum permitted unwanted emission level cannot exceed the level of the fundamental emission.

## DUTY CYCLE

No Duty Cycle Factor was used. The test sample was operating at close to 100% duty cycle and the maximized peak signal of the 457kHz fundamental frequency met the average limit specified in 15.209.

## Test Method

### 15.209 Fundamental & Spurious Radiated Emissions

The test sample was placed on a 80cm high wooden test stand which was located 3 meters from the test antenna on an FCC listed open area test site. Emissions from the EUT were maximized by rotating the test sample and adjusting the test sample orientation and antenna polarization. The maximized peak field strength of each emission was measured and recorded and compared to the specified limits. The 3 meter measurements were extrapolated to the 300 meter limits using the 40dB/decade extrapolation factor specified for frequencies less than 30MHz.

**Test Results:** The maximized peak field strength at 457kHz was below the average limit specified in 15.209 and therefore also met the peak emission requirement specified in 15.35. No harmonic or spurious emissions were observed at 3 or 1 meter test distances.

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Radiated Emissions 450 kHz to 1 GHz								
Customer:	Ortovox			Job No:	R-4719N				
Test Sample:	Avalanche Transceiver								
Model No:	S1			Serial No:	N/A				
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.209								
Operating Mode:	Transmitting signal @ 457 kHz								
Technician:	M. Seamans			Date:	3/6/2007				
Notes:	Test Distance: 3 Meters      Detector used: Peak								
Test Frequency	Antenna Polarization	Uncorrected Reading	Correction Factor	Duty Cycle Factor	Corrected Reading	Distance Factor	Corrected Reading	Converted Reading	Average Limit at 300 Meters
MHz	/EUT Axis	dBuV	dB	dB	dBuV/m	dB	dBuV/m	uV/m	uV/m
Radiated Emission Limit (Per 15.209)									
0.45	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
0.457	V/X	72.63	9.10	0.00	81.73	-80.00	1.73		1.22
0.457	V/Y	62.06	9.10	0.00	71.16	-80.00	-8.84		0.36
0.457	V/Z	73.64	9.10	0.00	82.74	-80.00	2.74		1.37
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
1000.00	-	-	-	-	-	-	-	-	-
The frequency range from 450 kHz to 1 GHz was scanned. No harmonic or spurious emissions were observed at 3 or 1 meter test distances.									

## RADIATED EMISSIONS SETUP PHOTOGRAPHS



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## RADIATED EMISSIONS EQUIPMENT LIST

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due</b>
3207	Loop Antenna, Active	EMCO	10 KHz - 30 MHz	6502	7/20/2006	7/20/2007
3427B	Biconical Antenna	Electro-Mechanics	20MHz - 200MHz	3104	4/6/2006	4/6/2007
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	5/24/2006	5/24/2007
5070	EMI Test Receiver	Rohde & Schwarz	20Hz - 40GHz	ESIB40	11/22/2006	11/22/2007
7034	Log Periodic Antenna	EMCO	200 MHz - 1 GHz	3146	4/6/2006	4/6/2007

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