

Advanced
Compliance Laboratory

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

STAFF TAG
MODEL: IT-744E
FCC ID: ST2-IT744E

December 04, 2012

This report concerns (check one): Original grant <input checked="" type="checkbox"/> Class II change <input type="checkbox"/>	
Equipment type: <u>Low Power Intentional Radiator</u>	
Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes <input type="checkbox"/> no <input checked="" type="checkbox"/>	
If yes, defer until: _____ (date)	
Company agrees to notify the Commission by _____ (date)	
of the intended date of announcement of the product so that the grant can be issued on that date.	
Transition Rules Request per 15.37? yes <input type="checkbox"/> no <input checked="" type="checkbox"/>	
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-90 Edition] provision.	
Report prepared for:	CENTRAK, INC.
Report prepared by:	Advanced Compliance Lab
Report number:	0048-121203-02-FCC



Lab Code: 200101

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT: STAFF TAG

Model: IT-744E

Applicant: CENTRAK, INC.

Test Type: FCC Part 15C CERTIFICATION

Result: PASS

Tested by: ADVANCED COMPLIANCE LABORATORY

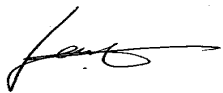
Test Date: December 04, 2012

Report Number: 0048-121203-02-FCC

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date December 04, 2012

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	STAFF TAG, Model IT-744 ⁽¹⁾	ST2-IT744E	
Housing	PLASTICS		
Power Supply	3V DC Battery		
Operation Freq.	904MHz ~ 926MHz		
Receiver	IT-744E(RX)	Verification	

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2003 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated February 21, 2012 (Test Firm Registration # 90601). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3448A0029 0	EMI Receiver	15/10/13
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	15/01/13
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	15/01/13
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	18/03/13
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/13
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	24/03/13
EMCO	3115	4945	Double Ridge Guide Horn Antenna	22/01/13

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

2. PRODUCT LABELING

FCC ID: ST2-IT744E

This device complies with part 15 of the FCC Rules. Operating is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Figure 2.1 FCC ID Label
(Only FCC ID shown on EUT)**



Figure 2.2 FCC Label Location

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently attached to the EUT with max length, 3”.

Testing was performed as EUT was continuously operated at the following frequency channels: Low=904MHz, Middle= 914MHz, High=926MHz.

Fresh external battery was used for extended operating time.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 to Figure 3.3 illustrate this system, which is tested standing along.



Figure 3.1 Radiated Test Setup, position 1



Figure 3.2 Radiated Test Setup, position 2



Figure 3.3 Radiated Test Setup, position 3





4. SYSTEM SCHEMATICS

See Attachment

Figure 4.1 System Schematics

5. RADIATED EMISSION DATA

5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

THE "DUTY CYCLE CORRECTION FACTOR" FOR SPURIOUS RADIATED EMISSIONS IS;
 $20 \log * (4 \text{ ms} / 100 \text{ ms}) = -28 \text{ dB}$, WHICH WAS USED TO CORRECT THE AVERAGE RADIATED EMISSION READINGS.

5.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 100KHz IF bandwidth / 100KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. Up to 10th harmonics were investigated.

5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel: _____



Typed/Printed Name: Edward Lee

Date: December 04, 2012

Radiated Test Data (CH-904MHz/914MHz/926MHz)

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
904	V/X	1.2	330	80.7	80.7	94	-13.3
1808	V/X	1.1	135	59.8	31.8	54	-22.2
2712	V/X	1.1	235	60.2	32.2	54	-21.8
904	H/X	1.2	180	90.7	90.7	94	-3.3
1808	H/X	1.1	235	62.3	34.3	54	-19.7
2712	H/X	1.1	090	57.6	29.6	54	-24.4
914	V/X	1.2	235	81.6	81.6	94	-12.4
1828	V/X	1.1	180	60.8	32.8	54	-21.2
2712	V/X	1.0	180	57.5	29.5	54	-24.5
914	H/X	1.2	045	91.6	91.6	94	-2.4
1828	H/X	1.1	330	61.0	33.0	54	-21.0
2742	H/X	1.1	330	56.5	28.5	54	-25.5
926	V/X	1.2	090	81.1	81.1	94	-12.9
1852	V/X	1.0	135	61.4	33.4	54	-20.6
2778	V/X	1.0	235	56.4	28.4	54	-25.6
926	H/X	12.0	045	91.9	91.9	94	-2.1
1852	H/X	1.0	235	60.8	32.8	54	-21.2
2778	H/X	1.0	235	55.7	27.7	54	-26.3
904	V/Y	1.2	270	89.8	89.8	94	-4.2
1808	V/Y	1.1	270	61.6	33.6	54	-20.4
2712	V/Y	1.0	045	60.6	32.6	54	-21.4
904	H/Y	1.1	235	90.0	90.0	94	-4.0
1808	H/Y	1.1	180	60.2	32.2	54	-21.8
2712	H/Y	1.0	180	57.3	29.3	54	-24.7
914	V/Y	1.2	235	90.9	90.9	94	-3.1
1828	V/Y	1.1	090	60.4	32.4	54	-21.6
2712	V/Y	1.0	270	60.2	32.2	54	-21.8
914	H/Y	1.2	135	89.8	89.8	94	-4.2
1828	H/Y	1.0	235	60.5	32.5	54	-21.5
2742	H/Y	1.0	180	56.4	28.4	54	-25.6
926	V/Y	1.2	235	91.9	91.9	94	-2.1
1852	V/Y	1.0	090	60.7	32.7	54	-21.3

2778	V/Y	1.0	090	58.2	30.2	54	-23.8
926	H/Y	1.2	235	89.2	89.2	94	-4.8
1852	H/Y	1.0	180	60.0	32.0	54	-22.0
2778	H/Y	1.0	180	55.7	27.7	54	-26.3
904	V/Z	1.2	270	92.8	92.8	94	-1.2
1808	V/Z	1.1	090	64.2	36.2	54	-17.8
2712	V/Z	1.1	090	60.2	32.2	54	-21.8
904	H/Z	1.2	235	89.1	89.1	94	-4.9
1808	H/Z	1.0	090	56.5	28.5	54	-25.5
2712	H/Z	1.0	090	57.5	29.5	54	-24.5
914	V/Z	1.2	270	92.7	92.7	94	-1.3
1828	V/Z	1.1	090	63.0	35.0	54	-19.0
2712	V/Z	1.1	135	59.6	31.6	54	-22.4
914	H/Z	1.2	235	88.8	88.8	94	-5.2
1828	H/Z	1.1	285	56.6	28.6	54	-25.4
2742	H/Z	1.0	135	56.7	28.7	54	-25.3
926	V/Z	1.2	270	92.9	92.9	94	-1.1
1852	V/Z	1.0	090	62.2	34.2	54	-19.8
2778	V/Z	1.0	090	58.3	30.3	54	-23.7
926	H/Z	1.2	235	88.5	88.5	94	-5.5
1852	H/Z	1.0	135	55.6	27.6	54	-26.4
2778	H/Z	1.0	135	55.4	27.4	54	-26.6

- (1) The limit for emissions within the 902-928MHz band is 50mV(94dB) per Sec. 15.249. The limit for its harmonics is 500uV (54dB). Other spurious emissions shall be lower than either its fundamental by 50dB or the limit defined in Sec. 15.209, whichever is higher.
- (2) If each peak reading is less than the FCC average limit, it'll be not necessary to show the measured/ calculated average reading.

Other Spurious outside of the band 902-928MHz

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
806	V/Y	1.2	180	31.9		46.5	-14.6
836	V/Y	1.2	045	32.1		46.5	-14.4
878	V/Y	1.1	330	34.5		46.5	-12.0
754	H/Y	1.0	235	38.6		46.5	-7.9
806	H/Y	1.0	235	36.2		46.5	-10.3
836	H/Y	1.0	235	35.5		46.5	-11.0
878	H/Y	1.0	180	35.5		46.5	-11.0

Comparing to the limit defined in Sec. 15.209, emissions below the limit by 20dB were not recorded

