125 Technology Parkway
Norcross, Georgia, US 30092

Test Report

LXE Model: 6730

FCC ID: KDZLXE6730M

Direct Sequence Spread Spectrum Transmitter

Mobile Equipment Certification

Applicant:	LXE Inc. 125 Technology Parkway Norcross, GA 30092
Purpose of Testing:	To demonstrate compliance with FCC Part 15 Subpart C

Prepared By:

Cyril A. Binnom Jr.
EMI/EMC Approvals Engineer

Issue Date: September 29, 2002

Table of Contents

1.0 GENERAL

1.1 Introduction

The purpose of this report is to demonstrate compliance with Part 15, Subpart C of the FCC's Code of Federal Regulations.

1.2 Product Description

1.2.1 General

The Equipment Under Test (EUT) is the LXE Model 6730, 2.4GHz Spread Spectrum Wireless LAN Access Point.

The LXE 6730 is an OEM Direct Sequence Spread Spectrum product manufactured by Cisco Systems. It is IEEE 802.11b compliant and operates in the band of 2400-2483.5 GHz. The unit is capable of 4 data rates and self adjusts to the most appropriate rate depending on the performance required. The data rates are 11, 5.5, 2 and 1 Mbps, where 11 Mbps gives the maximum throughput for data transfer, and 1 Mbps gives the best coverage where only small data packets are sent.

The unit has 2 ports, each capable of TX/RX. The unit can be used either with a single antenna scheme in one port, or a diverse antenna scheme using both ports.

1.2.2 Intended Use

The LXE 6730 Wireless LAN Access Point is defined as mobile product section 2.1091 of the FCC rules. Users instructions inform the user of the correct way to use these devices in such a manner as to maintain a distance of 20cm from the general population. Detailed operating configurations and exposure conditions are included in the RF safety submittal of this filing.

The unit has been evaluated to, and found to comply with, FCC Part 15, Subpart B, Class B emission requirements.

1.2.3 Technical Specifications

Table 1: Specifications

Frequency Band	2400-2483.5 MHz
Number of Channels	11
Modulation Technique	BPSK 1 Mbps QPSK 2 Mbps CCK 5.5 and 11 Mbps
Interface	Mini-PCI
Dimensions	2.006 in. X 2.346 in.53.95 mm X .099 in (Mini PCI Card)
Output power	20 dBm nominal
Power Consumption PC Card	Doze mode 10 mA
	Receive mode 360 mA
	Transit mode 600 mA at max output power
Temperature Range (operational)	0-70ºC 95% max. humidity (non condensing)
Operating Systems	DOS Windows 95 Windows 98 Windows NT® Windows 2000
Standards	IEEE 802.11b
Regulations	FCC Part 15 Subpart C

1.2.4 Antennas

Table 1 below gives the antennas we wish to include with this filing. In addition it identifies the terminal devices in which each antenna will be used with the transmitter. These terminal devices are further described in section 1.2.4 and in the RF safety submittal of this filing.

Table 1: Antennas

Manufacturer	Mfr. P/N	LXE P/N	Type	Gain (dbi)
Cushcraft	RTN2400SXR	153180-0001	Omni	0
Cushcraft	S2400FGNM	153325-0001	Omni	0
LXE	SPIRE	155845-0001	Omni	6
LXE	SPIRE	155846-0001	Omni	3
Cushcraft	PC2415N	460602-3020	Yagi	15
Mobile Mark	OD9-2400	480424-0411	Omni	9
Mobile Mark	OD12-2400	480429-0411	Omni Directional	12
Cushcraft	S2401290P 12RTN	480429-2703	Patch	12
Cushcraft	N/A	480429-3508	Patch	8
Cisco	AIR-ANT2012	TBD	Diversity Patch	6
Cisco	AIR-ANT2506	TBD	Omni	5
Hypergain	2415P	TBD	Patch	15

Notes:
Only the highest gain of each antenna type was tested.

2.0 LOCATION OF TEST FACILTY

The LXE test facility is located at the following address:

LXE, Inc.
An Electromagnetic Sciences Company
125 Technology Parkway
Norcross, GA US 30092-2993

2.1 DESCRIPTION OF OPEN AREA TEST SITE

All tests were conducted at the manufacture's test facility at a location specifically prepared for this testing. The radiated emissions test site meets the characteristics of ANSI C63.4:1992, CISPR 16 and EN 55022:1998-. This site has been fully described and submitted to the FCC, and accepted in their letter with registration number 90763.

The open area test site (OATS) is located in the center of the rooftop of the building. The roof is located at a height of approximately 8 meters above the ground. The 3 meter radiated emissions test site is an open, flat area approximately 6.2m x 9.2m in dimension. All reflecting objects including test personnel lie outside the perimeter of the ellipse. The site has a ground plane which extends 2 meters past the mast and equipment under test (EUT). Material of the ground plane, comprised of individual 1/4" metal screen mesh rolls, were soldered at the seams with gaps smaller than 1/10 of the wavelength at 1000MHz. The ground plane is connected to the earth ground by ground rods. All wiring is done at floor level around the test site periphery.

A nonconductive remotely controlled turntable approximately 0.91m x 1.2m x 0.8m was used to measure radiated emissions from all sides of the EUT. The turntable has a center opening that allows cabling to be routed directly down to the conducting ground plane.

The radiated emissions test setup is shown in figure 1.

2.2 Radiated Emissions Testing Facility Drawing

All dimensions are in meters (m)

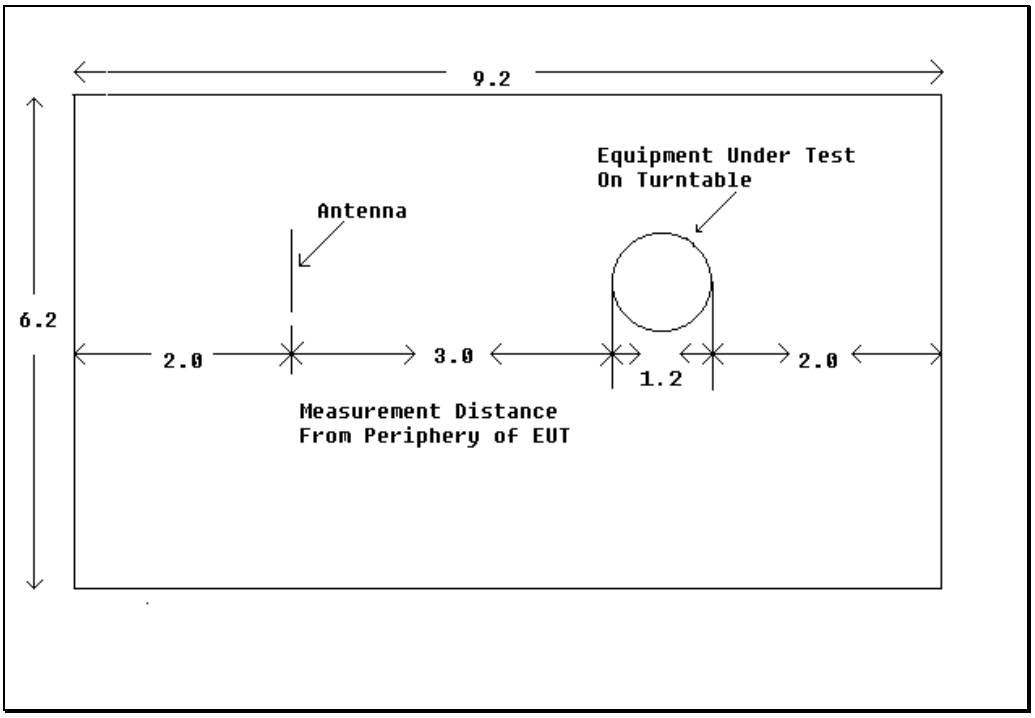

Figure 1: Open Area Test Site(OATS)

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

1 - ANSI C63.4-1992: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz

2 - US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators (October 1997)

3 - FCC Bulletin 97-114 Appendix C - Guidance on Measurements for Direct Sequence Spread Spectrum Systems

4 - FCC OET Bulletin 65 Appendix C - Evaluating Compliance with FCC Guidelines for Human Exposure to Radio-frequency Electromagnetic Fields

4.0 LIST OF TEST EQUIPMENT

All test equipment used for regulatory testing is calibrated yearly or according to manufacturers specifications. The equipment shown below in table 2 was used during this testing.

Table 2: Test Equipment

Cal #	MFG Name	Item Name	Model #:	Serial #	Recal Date:
53	Hewlett Packard	Spectrum Analyzer	8563E	3304A00657	6/1/03
134	Hewlett Packard	Power Meter	436A	1803A03368	2/26/03
202	Hewlett Packard	Amp, .01-26.5 GHz	83006A	3104A00543	12/06/02
228	Electro-Metrics	Antenna	RGA-60	6165	5/2/03
50	EMCO	Antenna 18-26.5GHz	3160-09	9806-1110	7/7/03
234	EMCO	Antenna, Log Periodic	3146	9102-3046	5/9/03
238	Hewlett Packard	Spectrum Analyzer	8591A	3131A02254	5/3/03
239	LXE	Pre-Amp	20-1000GHz	001	5/21/03
333	Hewlett Packard	Power Sensor	8482H	2704A03933	2/26/03
404	Microwave Circuits	High-Pass Filter	H04G18G2	0002	1/16/03
450	LXE	RF Cables (High Freq. Short)	none	Copper	3/18/03
451	LXE	RF Cables (High Freq. Double)	7015/6986	MFR-57500	3/18/03
452	EMCO	Mast, Antenna, Mini	2075	PN399235	N/A
453	EMCO	Turntable	2065	PN399230	N/A
515	Tensor	Antenna, Biconical	4104	2157	5/8/03
99998	Lindgren Enclosure	RF Enclosure	14-2/2-0	8147	N/A

5.0 SUPPORT EQUIPMENT

Table 3: Support Equipment

Manufacturer	Equipment Type	Model Number	Serial Number	FCC ID
Dell	LapTop Computer	PLL	0009206D-12800-947-1278	N/A
LXE	VX4	N/A	N/A	N/A

6.0 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

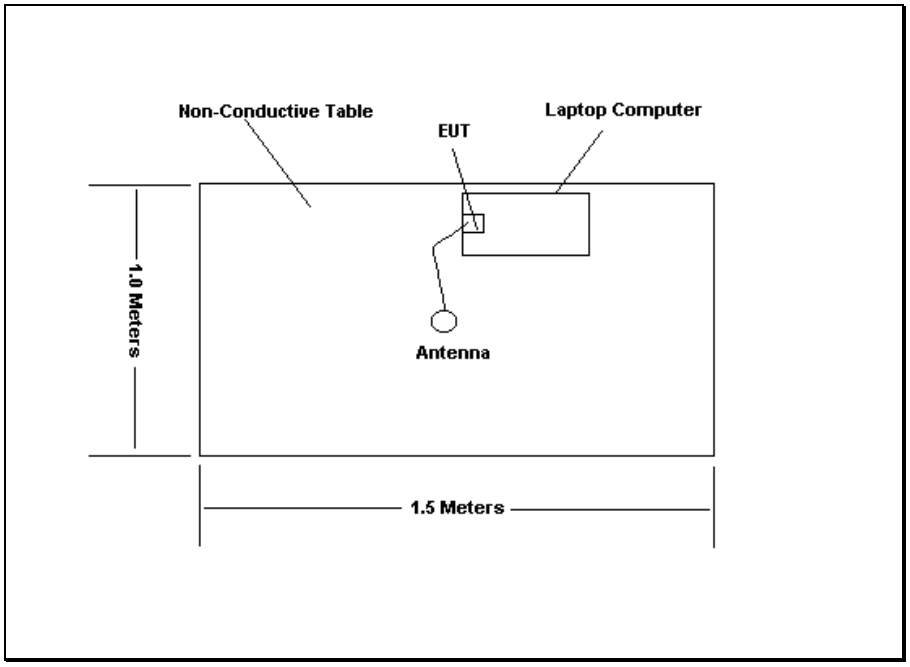

Figure 2: EUT Test Setup

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement - FCC Section 15.203

The antennas described in section 1.2.3 are designed with unique and/or proprietary connectors and are not interchangeable with standard antennas without electrical and mechanical modification of the unit.

7.2 Power Line Conducted Emissions - FCC Section 15.207

The EUT is powered by 120 VAC / 60 Hz. The unit connects to the AC mains through an AC/DC brick supply. Refer to Appendix D for test report.

7.3 Radiated Emissions - FCC Section 15.209

Radiated emissions tests were attempted over the frequency range of 30MHz to 25GHz, 10 times the highest fundamental frequency. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements were made with the Spectrum Analyzer's resolution bandwidth set to 120KHz for measurements above 30MHz and 1MHz for measurements above 1 GHz.

7.4 6dB Bandwidth Requirement - FCC Section 15.247(a)(2)

For the 6dB bandwidth test, the EUT was caused to generate a continuous carrier on the high, middle and low channels at all available data rates. Tabulated data is shown below in table 4 and a plot of the worst case is shown in figure 3 below. The plot is of the mid channel (2442 MHz) at a data rate of 11Mbps.

Table 4: 6dB Bandwidth

Data Rate (Mbps)	Channel 1 – 2412MHz (MHz)	Channel 7 – 2442MHz (MHz)	Channel 11 – 2462MHz (MHz)
1	9.13	9.6	9.0
2	8.80	9.3	8.7
5.5	8.57	8.4	8.94
11	8.28	8.0	8.3

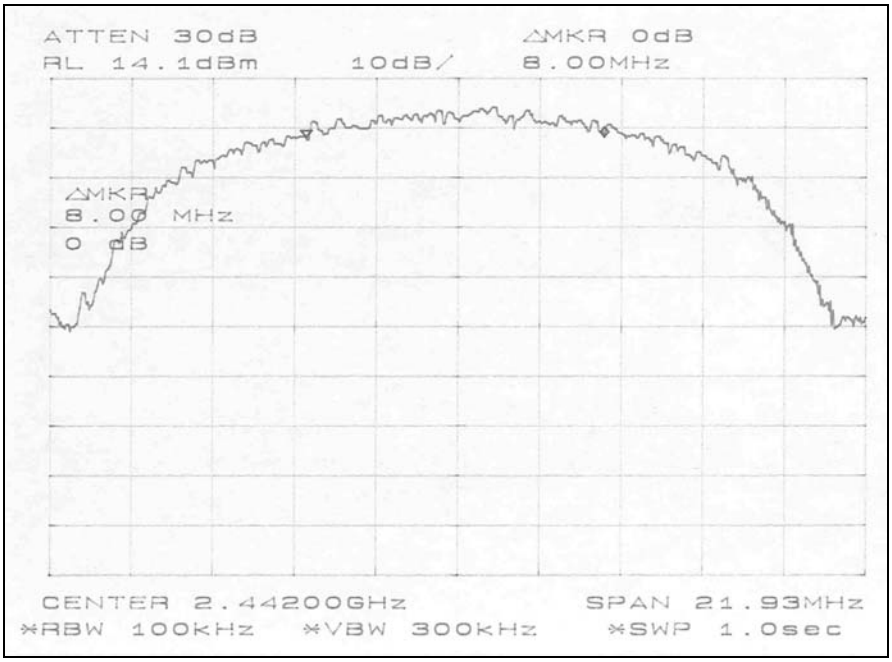

Figure 3: Worst Case 6dB Bandwidth

7.5 Peak Output Power Requirement - FCC Section 15.247(b)

The peak output power of the EUT was made at the antenna connector using an HP436A power meter and an HP8482H power sensor. The EUT was caused to generate a constant carrier on high, mid and low channels of the device. On each channel the EUT was then cycled through each of it's data rates. Table 5 below shows the results of this test.

Table 5: Peak Output Power

Measured Levels - S/N VDF0618Q1M6						
Data Rate	Channel 1		Channel 7		Channel 11	
(Mbs)	Right	Left	Right	Left	Right	Left
1	19.98	19.73	19.70	19.84	19.82	19.10
2	19.03	19.77	19.71	19.83	19.74	19.11
5.5	19.95	19.76	19.73	19.82	19.70	19.11
11	19.95	19.75	19.74	19.81	19.66	19.11

Highest Power Level:

19.98 dBm

99.54 mW

7.6 Spurious Emissions - FCC Section 15.247(c)

7.6.1 RF Conducted Spurious Emissions

The EUT was investigated for conducted spurious emissions from 30MHz to 25GHz, 10 times the highest fundamental frequency. For each measurement, the spectrum analyzer's VBW was set to 100kHz and the RBW was set to 1MHz.

The RF conducted spurious emissions found in the band of 30MHz to 25GHz are reported in Table 6 below. Each emission was compared to the fundamental reference level, also reported in the table below, to determine if they were at least 20dB below the reference level. Plots of the emissions were taken and filed separately as Appendix A

Table 6: Conducted Spurious Emissions

Channel	Fundamental Frequency (MHz)	Fundamental Reference Level (dBm)	Frequency of Spurious Emissions (MHz)	Level (dBm)	Δ(dB)
1	2412	7.33	446	-46.17	-38.84
			1646	-48.00	-40.67
			2024	-51.33	-44.0
			2795	-52.17	-45.64
			4820	-50.00	-42.67
6	2437	6.83	444	-46.67	-39.84
			1646	-50.33	-43.50
			2024	-51.00	-44.17
			2792	-52.83	-46.00
			4817	-50.00	-43.17
11	2462	6.67	447	-45.7	-39.03
			1651	-51.5	-44.83
			2024	-51.0	-44.33
			2795	-51.83	-45.16
			4820	-49.67	-43.00

7.6.2 Radiated Spurious Emissions (Restricted Bands) - FCC Section 15.205

Radiated emissions tests were made over the frequency range of 30MHz to 25GHz, 10 times the highest fundamental frequency. For convenience, peak measurements were taken and compared to the average limits. If the peak measurement did not meet the average limit, then an average measurement was made and compared to the average limit.

Due to high ambient noise levels and small EUT size, radiated emission measurements were made at a distance of 1 meter. An inverse proportionality factor of 20 dB per decade was used to normalize the measured data to the specified distance to determine compliance. The formula used to calculate an inverse proportionality factor is 20 log (D1/D2), where D1 is the distance used and D2 is the specified distance. A correction factor of 9.54dB applied to the measurements.

The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. The spectrum analyzer's video and resolution bandwidths were set to 1MHz.

The EUT was caused to generate a constant carrier on the high, mid and low channels of operation at the data rate of 1Mb/s, which has given the highest output of all data rates available. Table 7 below shows the results of all detectable points in the band of evaluation. Plots of each significant signal were taken and were filed separately as Appendix B (1) through B (4).

Table 7a: Peak and Average Measurements
Antenna: LXE P/N 460602-3020, 15db Hypergain

Frequency (MHz)	Antenna Distance (m)	Level (dBm)	Detector Function (P/A)	Correction Factors (dB)	Corrected Level (dBm)	Limit (uV/m)	Margin (dB)	Final Result (Pass/Fail)
4824	3	33.8	P	16.0	49.80	74.00	24.20	**PASS**
4824	3	26.7	A	16.0	43.70	54.00	11.30	**PASS**
4884	3	34.8	P	16.0	50.80	74.00	23.20	**PASS**
4884	3	25.3	A	16.0	41.30	54.00	12.70	**PASS**
4924	3	36	P	16.0	52.00	74.00	22.00	**PASS**
4924	3	29.8	A	16.0	45.80	54.00	8.20	**PASS**

Table 7b: Peak and Average Measurements
Antenna: LXE P/N 480429-0411, 15db Yagi

Frequency (MHz)	Antenna Distance (m)	Level (dBm)	Detector Function (P/A)	Correction Factors (dB)	Corrected Level (dBm)	Limit (uV/m)	Margin (dB)	Final Result (Pass/Fail)
4824	3	39.7	P	16.0	55.70	74.00	18.30	**PASS**
4824	3	33.8	A	16.0	49.80	54.00	4.20	**PASS**
4884	3	36.5	P	16.0	52.50	74.00	21.50	**PASS**
4884	3	32.2	A	16.0	48.20	54.00	5.80	**PASS**
4924	3	35.7	P	16.0	51.70	74.00	22.31	**PASS**
4924	3	30.7	A	16.0	46.70	54.00	7.30	**PASS**

Table 7c: Peak and Average Measurements
Antenna: LXE P/N 480429-0411, 12db Omni-Directional

Frequency (MHz)	Antenna Distance (m)	Level (dBm)	Detector Function (P/A)	Correction Factors (dB)	Corrected Level (dBm)	Limit (uV/m)	Margin (dB)	Final Result (Pass/Fail)
4824	3	33.8	P	16.0	49.8	74.00	24.2	**PASS**
4824	3	26.8	A	16.0	42.8	54.00	11.2	**PASS**
4884	3	32.3	P	16.0	48.3	74.00	25.7	**PASS**
4884	3	27.2	A	16.0	42.2	54.00	10.8	**PASS**
4924	3	34.5	P	16.0	50.5	74.00	23.5	**PASS**
4924	3	26.5	A	16.0	42.5	54.00	11.5	**PASS**

Table 7d: Peak and Average Measurements
Antenna: LXE P/N 480429-2703, 12db Patch

Frequency (MHz)	Antenna Distance (m)	Level (dBm)	Detector Function (P/A)	Correction Factors (dB)	Corrected Level (dBm)	Limit (uV/m)	Margin (dB)	Final Result (Pass/Fail)
4824	3	36	P	16.0	52.0	74.00	22.0	**PASS**
4824	3	27.2	A	16.0	42.2	54.00	10.8	**PASS**
4884	3	35.3	P	16.0	51.3	74.00	22.7	**PASS**
4884	3	25.5	A	16.0	41.5	54.00	12.5	**PASS**
4924	3	34.5	P	16.0	50.5	74.00	23.5	**PASS**
4924	3	29.2	A	16.0	45.2	54.00	8.8	**PASS**

Correction Factors
AF = Antenna Factor
CA = Cable Attenuation
AG = Amplifier Gain
RL = Receiver Level

Therefore:
CF_T = Total Correction Factor = RL+AF+CA-AG

7.7 Power Spectral Density - FCC Section 15.247(d)

The spectral density was measured in accordance with OET bulletin 97-114, appendix C. The EUT was caused to generate a constant carrier on a high, middle and low channels at the data rate of 1Mb/s, which has given the highest output of all data rates available. The results are recorded in Table 8 below. A plot of the worst-case measurement was taken of each of the emissions and is shown in figure 4 below.

Table 8: Spectral Density

Channel	Receiver Level (dBm)	Limit (dBm)	Margin (dB)
1	-8.83	8	16.83
7	-6.67	8	14.67
11	-7.83	8	15.83

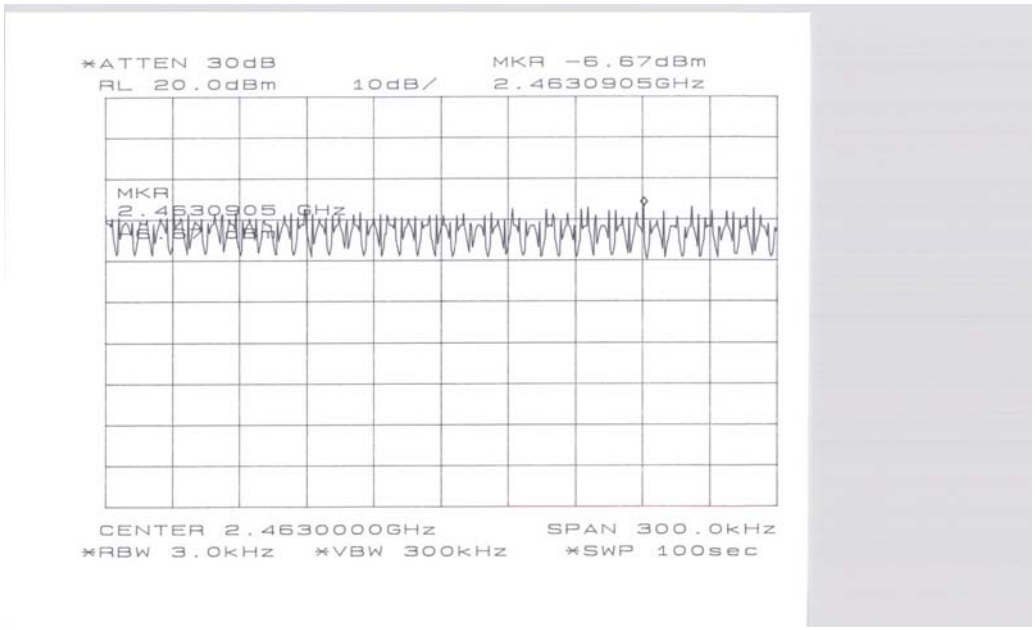

Figure 4: Worst Case Spectral Density Measurement

9.0 Sample Label
The label shown below will be placed directly on the EUT and on the exterior of the host device.

10.0 RF Safety Notice
An RF Safety Notice appears with the product when shipped with the Access Point.

A representative Notice:

Caution 	***This device is intended to transmit RF energy. For protection against excessive RF exposure to humans and in accordance with FCC rules and Industry Canada rules, this transmitter should be installed such that a minimum separation distance of at least 20cm is maintained between the antenna and the general population. This device is not to be co-located with other transmitters.***

Detailed operating configurations, exposure conditions, and safety notices are included in Appendix E, the RF safety submittal of this filing.

Appendix A

Conducted Spurious Emission Plots

Appendix B (1)

Radiated Spurious Emission Plots

Antenna P/N 460602-3020
15db Hypergain

(6 plots)

Appendix B (2)

Radiated Spurious Emission Plots

Antenna P/N 480429-0415
15db Yagi

(6 plots)

Appendix B (3)

Radiated Spurious Emission Plots

Antenna P/N 480429-0411
12db Omni Directional

(6 plots)

Appendix B (4)

Radiated Spurious Emission Plots

Antenna P/N 480429-0411
12db Patch

(6 plots)

Appendix C

Radiated Spurious Emissions Upper Bandedge

Appendix D

Powerline Conducted Emissions Per 15.207

An EMS Technologies Company
125 Technology Parkway
Norcross, Georgia, US 30092

August 28, 2002

Manufacturer:	**LXE Inc. 125 Technology Parkway Norcross, GA 30092-2913**
LXE Project:	**02-059**
Equipment Under Test:	**6730**
Testing Performed By:	**LXE Inc.**
Scope of Testing:	**FCC Part 15, Subpart C**
Section of Standard:	**15.207 - Conducted Emissions**
Test Initiated:	**August 20, 2002**
Test Completed:	**August 20, 2002**

Report Prepared By: _____
Cyril A. Binnom Jr.
EMI/EMC Engineer

Report Reviewed By: _____
Alex McKinney
Product Safety Engineer

Table of Contents

1.0 INTRODUCTION

1.1 Equipment Under Test

The equipment under test is the LXE Model 6730 Access Point, which is an OEM version of the Cisco Systems AIR-AP350.

1.2 Scope

To demonstrate conformance with the US Code of Federal Regulations (CFR): Title 47, Part 15, Radio Frequency Devices, Subpart C, Intentional Radiators and detail the results of testing performed on the LXE Model 6730.

1.3 Purpose

Testing was performed to evaluate the 6730 conducted emissions performance in accordance with 47 CFR § 15.207.

1.4 Relevant Standards and References

The following standards were used to evaluate the EUT:

1 - ANSI C63.4-1992: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz

2 - US Code of Federal Regulations (CFR): Title 47, Part 15, Radio Frequency Devices, Subpart C, Intentional Radiators (October 2001).

1.5 Applicability of Standards

The EUT was considered to be an intentional radiator that connects to AC power lines indirectly, according to the definition given in (CFR): Title 47, Part 15, Radio Frequency Devices. Subpart C, Intentional Radiators Sec. 15.207(d).

2.0 TEST FACILITIES/RESOURCES

2.1 Location

All testing was performed at test facilities located at the following address:

LXE, Inc.
An Electromagnetic Sciences Company
125 Technology Parkway
Norcross, GA US 30092-2993
Tel: (770) 447-4224
Fax: (770) 447-6928

2.1.1 Radiated Emissions

The Open Area Test Site (OATS) is located in the center of the rooftop of the building. The roof is located at a height of approximately 8 meters above the ground. The 3 meters radiated emissions test site is an open, flat area (open area) test site approximately 6.2m x 9.2m in dimension. All reflecting objects including test personnel lie outside the perimeter of the ellipse. The 3 meters test site ground plane is made of a 1/4" metal screen mesh which extends 2 meters past the mast and EUT. The ground plane has no gaps with linear dimensions that are greater than 1/10 of a wavelength at the highest frequency of measurement (about 3 cm at 1000MHz). Material of the ground plane, comprised of individual 1/4" metal screen mesh rolls, were soldered at the seams with gaps smaller than 1/10 of the wavelength. The ground plane is connected to the earth ground by ground rods. All wiring is done at floor level around the test site periphery. The radiated emissions test setup is shown in figure 2.1-1.

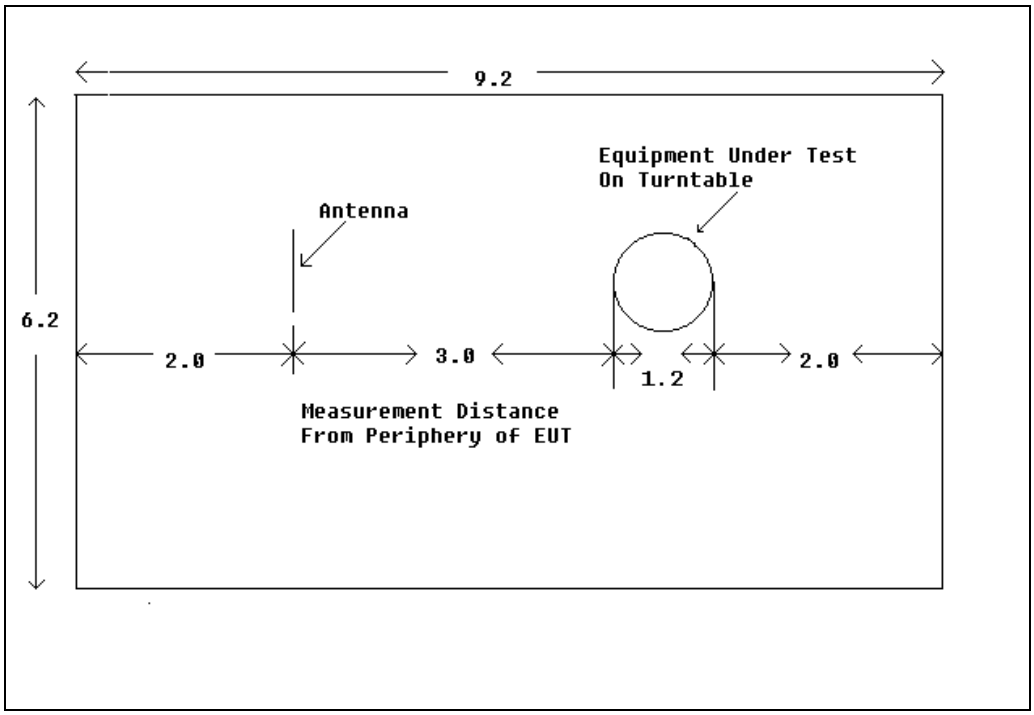

FIGURE 2.1-1 OPEN AREA TEST SITE

2.1.2 Conducted Emissions

The conducted emissions test site is a Double Electrically Isolated (DEI) shielded screen room located in the engineering lab. An approximately 3.1 m wide x 2.2 m deep x 2.4 m high shielded screen room was used to perform AC powerline conducted emissions tests. The DEI shielded screen room provides the maximum shielding performance available in a "hear-through, see-through" structure. The DEI shielded screen room is made of 360 degrees double shielded copper screen sheets and is manufactured by Lindgren RF Enclosures, model 14-2/2-0, serial 8147. The use of copper results in unusually good shielding effectiveness in the higher planewave and microwave frequencies. The DEI shielded screen room archives over 120dB of shielding effectiveness from 14KHz to 1GHz. Power for the shielded room is filtered (Lindgren RF Enclosures, P/N 250946, rated 125/250 VAC, 60A, 50/60 Hz). All wiring is done at the wall around the shielded screen room and is electrically bonded to earth ground by a ground rod.

The Line Impedance Stabilization Networks is an EMCO model 3810/2. The LISN housing is electrically bonded to the conducting plane. The equipment under test for tabletop testing is placed on a nonconductive table of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane and 0.8m minimum from the cases of the LISN. The AC powerline emissions test setup is shown in figure 2.1-2.

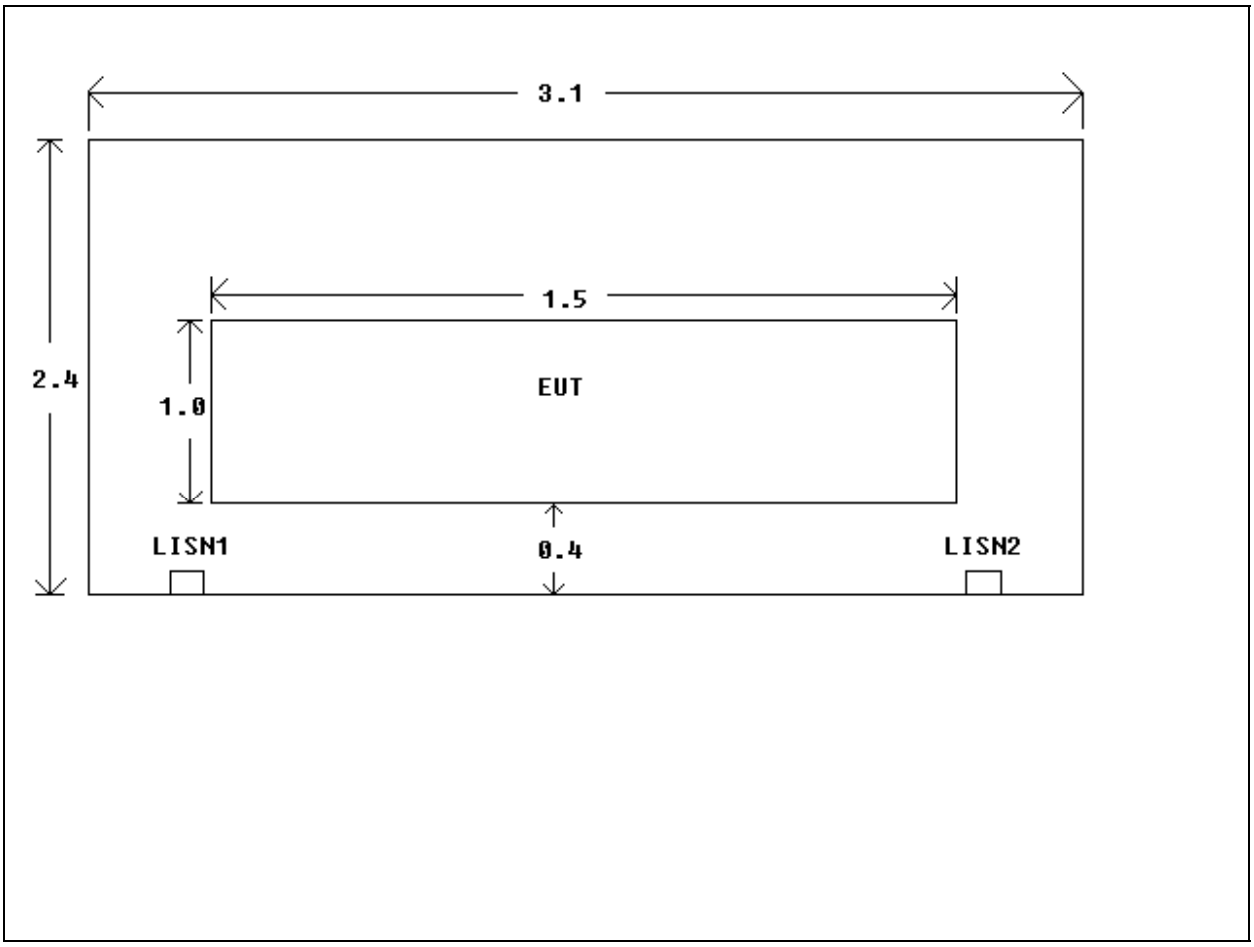

Figure 2.1.2 Conducted Emissions Screen Room

2.2 Test Equipment

Table 2.2-1 lists all test and support equipment

TABLE 2.2-1 TEST AND SUPPORT EQUIPMENT

Cal #	Manufacturer:	Equipment Type:	Model #:	Serial #	Recal Date:
53	Hewlett Packard	Spectrum Analyzer	8563E	3304A00657	5/23/02
62	Compliance Design, Inc.	Antenna, Dipole	B1000	265	4/12/02
202	Hewlett Packard	Amp, .01-26.5 GHz	83006A	3104A00543	11/30/01
228	Electro-Metrics	Antenna	RGA-60	6165	8/3/02
229	Electro-Metrics	Antenna	RGA-60	6166	4/9/02
230	EMCO	LISN	3810/2NM	9505-1024	6/12/02
515	Tensor	Antenna, Biconical	4104	2157	5/10/02
232	Electro-Metrics	Antenna, Biconical	BIA-25	1165	7/12/02
514	EMCO	Antenna, Log Periodic	3146	9102-3046	5/10/02
234	EMCO	Antenna, Log Periodic	3146	9011-2946	7/5/02
238	Hewlett Packard	Spectrum Analyzer	8591A	3131A02254	5/23/02
239	LXE	Pre-Amp	20-1000GHz	001	4/30/02
394	Microwave Circuits	High-Pass Filter	H3G020G2	0001 DC9853	1/27/02
450	LXE	RF Cables (High Freq. Short)	none	Copper	11/05/02
451	LXE	RF Cables (High Freq. Double)	7015/6986	MFR-57500	11/05/02
452	EMCO	Mast, Antenna, Mini	2075	PN399235	N/A
453	EMCO	Turntable	2065	PN399230	N/A
448		18" RTNC to N RF Cable	154401-0001	N/A	6/1402
449		18" RTNC to N RF Cable		N/A	6/14/02
99998	Lindgren Enclosure	RF Enclosure	14-2/2-0	8147	N/A

3.0 TEST METHODOLOGY

3.1 Test Description

US Code of Federal Regulations (CFR): Title 47, Part 15, Radio Frequency Devices, Subpart C, Intentional Radiators (October 2001), was the guiding document for this test.

The EUT was configured and connected to satisfy its functional requirements and represent good installation practices. The EUT laid flat on a non-conductive table measuring 1.5 meters x 1.0 meters x .8 meters. The equipment under test was positioned at 0.8 meters above the ground plane and 0.8 meters minimum from the LISN, which is electrically bonded to the conducting plane. AC main input power cables in excess 1m were folded back and forth to form a bundle 30cm to 40cm in length.

.

3.2 System Configuration

The EUT was configured in a typical manner and evaluated to obtain a worst-case configuration, which consisted of an active 6730. The software used during testing, entitled AP/BR Compliance Testing Interface" was used to monitor the EUT's performance. This program exercised both communication ports as well as the computer hardware to establish a fully operational unit.

3.3 Test Procedure

For the conducted emissions tests, measurements were made over the frequency range of 150 kHz to 30MHz. Radiated measurements were made with the Spectrum Analyzer's resolution bandwidth set to 9KHz and video bandwidth set to 30kHz.

TABLE 3.3-1: EMISSION LIMITS

Emission Type	*Frequency Range (MHz)*	*Voltage limits (dB uV)*
Conducted Power Line	0.45 to 30.0	48.0

Detector Function: The HP Spectrum Analyzer with Quasi-Peak detectors and average detector modes are in accordance with ANSI C63.2. All test equipment is calibrated annually or in accordance with the manufacturer's specification.

3.4 Support Equipment

The EUT was configured using the support equipment given in table 3.4-1 below.

TABLE 3.4-1 EUT CONFIGURATION

Diagram #	Description	Manufacturer	Model/Part #	Serial #	FCC ID
1(EUT)	DSSS Wireless Access Point	LXE	6730 AP	VDF0619Q1M6	KDZLXE6730M
2	Ferrite	Steward	N/A	N/A	N/A.
3	AC Adapter	Cisco Systems	PSA18U-480C	D059038	NONE

3.5 System Block Diagram

Device numbers in block diagram refer to diagram numbers in table 3.4-1 above:

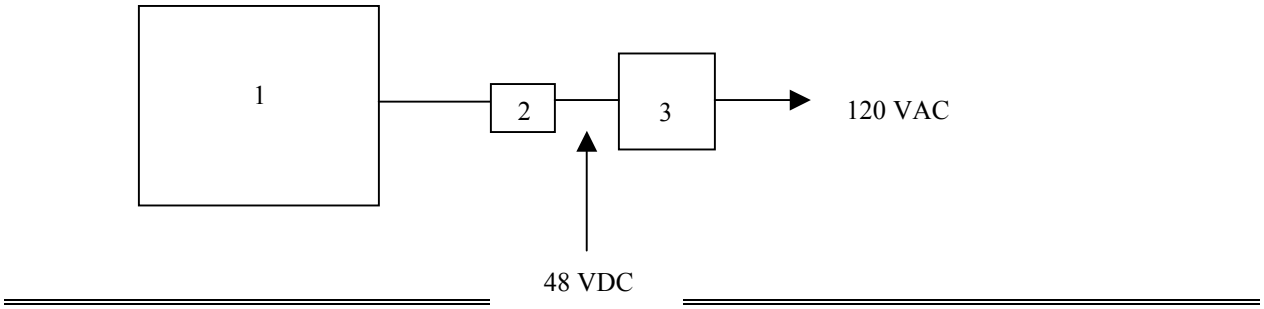

Figure 3.5-1: EUT Set up configuration

3.6 Test Set-up Photographs

3.6.1 Radiated Emissions

NOT APPLICABLE

3.6.2 Conducted Emissions

4.0 Test Results

4.1 Conducted Emissions

The EUT was found to comply with requirements called out under FCC 15.207 Subpart C for conducted emissions. Tabulated conducted emissions data is reported in data tables 4.1-1 below:

FCC Part 15 Data Form 4.1-1

FCC PART 15 CONDUCTED EMISSIONS

DATE: August 20, 2002
EUT: 6730
MODEL #:
EUT VOLTAGE: 120 VAC/60 Hz √ 48 VDC _____ OTHER: _____
TYPE OF TEST:

CONDUCTED EMISSIONS

Frequency (MHz)	Corrected Reading (dBuV)		Limits (dBuV)	Margin (dB)	
	L1	L2		L1	L2
1.94	37.9	39.1	48	-10.1	-8.9
4.25	39.4	40.1	48	-8.6	-7.9
5.467	41.4	41.8	48	-6.6	-6.2
6.04	42.1	41.9	48	-5.9	-6.1

Corrected Reading (dBuV) = Uncorrected Reading (dBuV) + Cable Loss + LISN Loss (dB)
Cable Loss + LISN Loss = 2db
Sample Calculation: 35.9 + 2.00 = 37.9
Margin: 48 – 37.96 = 10.1

Comments:

Testing Performed By:
Cyril A. Binnom Jr.

√ Based on the above results, The EUT meets the FCC Part 15.207 conducted emission limits.

_____ Due to the absence of an input AC power port, this test was deemed unnecessary. EUT is DC powered.

5.0 Conclusion

The product(s) covered by this report has been tested and found to comply with the requirements called out in FCC Part 15 Subpart C Section 15.207.

Prepared by:

Cyril A. Binnom Jr.
EMI/EMC Approvals Engineer
LXE, Inc.
Date: August 22, 2002

Reviewed by:

Alex McKinney
Product Safety Engineer
LXE, Inc.
Date: August 22, 2002

Appendix E

RF Safety

125 Technology Parkway
Norcross, Georgia, US 30092

RF Exposure Compliance Statement

FCC 15.247(b)(4) & FCC 2.1091 Mobile Devices

LXE Model 6730

FCC ID: KDZLXE6730M

LXE Project No: 02-059

Issue Date: August 1, 2003

LXE 6730 Wireless Access Point

The LXE 6730 is an OEM Direct Sequence Spread Spectrum product manufactured by Cisco Systems. It is IEEE 802.11b compliant and operates in the band of 2400-2483.5 GHz. The unit is capable of 4 data rates and self adjusts to the most appropriate rate depending on the performance required. The data rates are 11, 5.5, 2 and 1 Mbps, where 11 Mbps gives the maximum throughput for data transfer, and 1 Mbps gives the best coverage where only small data packets are sent.

The unit has 2 ports, each cable of TX/RX operation. The unit can be used either with a single antenna scheme in the main port, or a diverse antenna scheme using both ports.

The average conducted output power of the 6730 is 19.22 dbm

The highest conducted output power of the 6730 is 19.98 dbm

Intended Use

The LXE 6730 Wireless Access Point is defined as mobile according to section 2.1091 of the FCC rules. The unit is typically mounted on a wall or ceiling and not designed to be used on or within 20cm of the body.

Antennas

The table below describes each of the antennas

Table 1: Antennas

Manufacturer	Mfr. P/N	LXE P/N	Type	Gain (dbi)	Power Density (S), at 20cm, in mW/cm^2
Cushcraft	RTN2400SXR	153180-0001	Omni	0	0.02
Cushcraft	S2400FGNM	153325-0001	Omni	0	0.02
LXE	SPIRE	155845-0001	Omni	6	0.08
LXE	SPIRE	155846-0001	Omni	3	0.04
Cushcraft	PC2415N	460602-3020	Yagi	15	0.63
Mobile Mark	OD9-2400	480424-0411	Omni	9	0.16
Mobile Mark	OD12-2400	480429-0411	Omni Directional	12	0.32
Cushcraft	S2401290P 12RTN	480429-2703	90 Directional	12	0.32
Cushcraft	N/A	480429-3508	Patch	8	0.125
Cisco	AIR-ANT2012	TBD	Diversity Patch	6	0.08
Cisco	AIR-ANT2506	TBD	Omni	5	0.063

Power Density Calculations at 20cm: *Per OET Bulletin 65*

Using the calculation given in OET Bulletin 65, $S = \frac{PG}{4\pi R^2}$, where

S = power density

P = power input to the antenna, in mW

G = power gain of the antenna

R = distance to the center of radiation of the antenna, in cm

Because the antenna gain is known in dBi, G must be converted first to a numeric gain by the equation: $G = 10^{\frac{dB}{10}}$

For the values given for S in the table, a value of 100mW (max radio output power) is used for P, and R is set at 20 cm.

Wall or ceiling mounted host

Access Point : 6730

The 6730 Access Point is providing the bi-directional routing of data traffic between the wireless LAN (the VX and MX computers) and the wired LAN backbone in an installation.

When installed according to the installation guide, the 6730 Access Point maintains a minimum of 20cm from the antenna to the general population. The following statement is included in the operator's guide of the 6730 AP:

Caution 	***This device is intended to transmit RF energy. For protection against excessive RF exposure to humans and in accordance with FCC and Industry Canada rules, this transmitter should be installed such that a minimum separation distance of at least 20cm (7.8 in.) is maintained between the antenna and the general population. This device is not to be co-located with other transmitters.***

Appendix F

Photo Exhibit