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May 20, 2009

CONFIDENTIAL TREATMENT REQUESTED

Marlene H. Dortch, Secretary
Federal Communications Commission
236 Massachusetts Ave, N.E., Suite 110
Washington, DC 20002

Attn: Thomas D. Fitz-Gibbon
Spectrum Enforcement Division
Enforcement Bureau, Room 3-A461

Re: Response in File No. EB-09-SE-064

Dear Ms. Dortch:

Motorola's response to the FCC's Letter of Inquiry dated April 20, 2009, in the above-referenced file (the "LOI") is provided with this letter. The LOI focuses on two Motorola Canopy U-NII devices, yet the scope of the Commission's inquiry extends beyond the Canopy product family. Accordingly, this response covers a total of seven Motorola U-NII product families approved under Subpart E of Part 15 of the Commission's Rules (*i.e.*, the U-NII Rules) as shown below.

U-NII Devices Sold and Distributed by Motorola

Product Family	Product Use
Canopy	Wireless Broadband Distribution
Orthogon	Point-to-Point ("PtP") Wireless Broadband
Symbol	802.11a Access Points / Handheld Devices
AirDefense	WLAN Security
Mesh	Mesh Networks
Normandy	WLAN Handset
Rugged Notebook	Notebook Computers

During its investigation into the issues relating to the LOI, Motorola became aware of two potential compliance issues involving the company's U-NII products, which are not directly covered by the questions in the LOI. These issues are summarized below and described in detail in two annexes to the response.

[redacted] This issue is described in further detail in Annex A.

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[redacted]

The attached response of Motorola is supported by the declarations of ten separate employees of the company. [redacted] provides the required declaration by an authorized officer of the company, and nine employees who are responsible for and have personal knowledge of aspects of Motorola's response relating to the seven U-NII product families provide declarations.

Finally, Motorola is requesting that the confidential business information provided in this response be kept from public inspection in accordance with Section 0.457 of the Commission's Rules. *See* 47 C.F.R. § 0.457. A separate request to this effect also is included.

If you have any questions regarding Motorola's response or require additional information, please contact the undersigned at (202) 371-6953.

Sincerely,

Steve B. Sharkey
Senior Director
Regulatory and Spectrum Policy

cc: Neal McNeil
David E. Hilliard, Wiley Rein LLP, Counsel to Motorola

Atts. Response of Motorola to LOI
Ten Declarations in Support of Response
DVD1 Containing Confidential Sales and Customer Information
DVD2 Containing Operator Manuals

Annex A – [redacted]
Annex B – [redacted]

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Response of Motorola to Questions in LOI

Motorola's responses to the FCC's questions in the April 20, 2009, Letter of Inquiry in File No. EB-09-SE-064 (the "LOI") are provided below. Certain responses reference spreadsheets and other electronic documents that are being provided to the Commission on DVDs labeled as DVD1 and DVD2. DVD1 contains confidential sales and customer information relating to Motorola's U-NII products, and DVD2 contains operator manuals associated with those products.

In responding to the LOI, Motorola makes no admission as to whether there has been any violation of the Communications Act of 1934, as amended (the "Act"), including Section 302(b) of the Act, or any FCC rule including Sections 2.803, 2.925 or 15.407(h)(2) of Title 47 of the Code of Federal Regulations. *See* 47 U.S.C. § 302(b); 47 C.F.R. §§ 2.803, 2.925, 15.407(h)(2).

Subject to the foregoing, Motorola's responses to the Commission's questions are as follows:

QUESTION NO. 1. *FCC field agents in San Juan, Puerto Rico recently investigated interference to the Terminal Weather Doppler Radar ("TWDR") at the San Juan International Airport. The agents observed that two Motorola Canopy U-NII devices installed on a rooftop, a 5.2 GHz device authorized under FCC ID ABZ89FC3789 (authorized to operate between 5275 and 5325 MHz), and a 5.7 GHz device authorized under FCC ID ABZ89FC5804 (authorized to operate between 5735 and 5840 MHz), were operating without authorization on 5600 MHz and causing interference to the TWDR, which operates on 5610 MHz.*

> *(a) State the date(s) on which Motorola began marketing the 5.2 GHz and 5.7 GHz Canopy U-NII devices in the United States, the total number of units of these devices sold and distributed in the United States to the present, the dates on which the units were sold and distributed, and to the extent known, the identity of the operator and the location where the device is installed. Provide a breakdown of these statistics for each version of the device, including the versions manufactured under the original grant of equipment certification and any subsequent permissive changes.*

RESPONSE: Table R1 below contains the dates Motorola began marketing the 5.2 GHz U-NII and 5.7 GHz ISM Canopy devices in the U.S. under FCC IDs ABZ89FC3789 and ABZFC5804,[1] the total number of units sold in the U.S. from July 2003 to the present, and the dates on which the units were sold and distributed by Motorola. This information is broken down by the versions of each device, including the versions manufactured under the original grants of certification and several subsequent permissive changes.

In general, Motorola does not know the identity of the operators or end users or the locations where the equipment is installed.[2] Motorola relies upon a dealer channel in which products are

[1] The ABZ89FC5804 device is not a U-NII device, as it was approved under the Part 15 Subpart C rules and operates in an ISM band. The device was not approved under the U-NII (Part 15 Subpart E) rules.

[2] The FCC disclosed the identity of certain operators to Motorola in a May 7, 2009, meeting.

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sold to distributors, that, in turn, sell the products to end users and professional installers. In this regard, detailed information regarding all product shipments since [redacted] is provided at Tabs entitled [redacted] and [redacted] in the [redacted] spreadsheet (located in the Sales Data\Canopy folder in the enclosed Confidential DVD1). That spreadsheet includes the equipment distributor names and addresses where the equipment was shipped. Data for sales of the referenced products prior to [redacted] are provided in the [redacted] file located in the same folder.

Table R1. ABZ89FC3789 Device and ABZFC5804 Device Marketing and Sales Information Since July 2003[3]

FCC ID	Application Grant	Date device was first marketed	Total number of units sold in U.S.	Dates units sold and distributed
ABZ89FC3789[4]	9/7/2001-Original Grant	[redacted]	[redacted]	From [redacted]
ABZ89FC3789	7/5/2005 – class II permissive change	[redacted]	[redacted]	From [redacted] to
ABZ89FC3789	7/27/07 – class II permissive change	[redacted]	[redacted]	From [redacted] to
ABZ89FC5804[5]	6/4/2003 - Original Grant	[redacted]	[redacted]	From [redacted] to
ABZ89FC5804	11/24/2004 – class II permissive change	[redacted]	[redacted]	From [redacted] to

[3] The data presented assume that all sales of a particular product following the date of a permissive change included the permissive change. Motorola acknowledges that earlier generation equipment, which did not include the permissive change, may have been sold following the date of a subsequent permissive change. Also, Table 1 does not include data for sales prior to July 2003 when Motorola used a different product tracking system; however all files relating to such sales are included in the [redacted] file referenced above.

[4] The FCC granted a class II permissive change on July 20, 2007, for a lens accessory to be used with FCC ID ABZ89FC3789. This accessory is sold as a separate attachment for the Canopy system.

[5] The FCC granted a class II permissive change on May 21, 2007, for a lens accessory to be used with FCC ID ABZ89FC5804. This accessory is sold as a separate attachment for the Canopy system.

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(b) Provide a detailed description as to how the 5.2 GHz and 5.7 GHz Canopy U-NII devices could be modified to operate on frequencies between 5470 and 5725 MHz.

RESPONSE: The 5.2 GHz U-NII and 5.7 GHz ISM Canopy devices could only be modified to operate on frequencies between 5470 and 5725 MHz with significant changes to the product software, which would involve a substantial effort in reverse engineering. Nonetheless, due to hardware limitations of the voltage controlled oscillator, ceramic filters and the integrated antennas, radios modified in this way would have significantly reduced RF and thermal performance.

Complicated hardware modifications to the printed circuit board assembly ("PCBA") would be required to regain some of the lost performance. Such modifications could include, but would not be limited to, replacement of the voltage controlled oscillator, ceramic filters, integrated antennas, and RF matching components, the removal of a portion or all of the RF shield as well as the modification of the copper traces and associated ground structures within the PCBA. This also would require a significant reverse engineering effort of the product hardware by highly skilled technicians. A radio thus modified most probably would still not have the performance level of a Canopy device designed and manufactured for operation in the 5.4 GHz band.

Based on the level of expertise, effort, and cost required to modify the product hardware and software, and given that Motorola already markets FCC authorized (FCC ID ABZ89FT7623) Canopy products that operate in the 5470 and 5725 MHz band at a cost equal to that of the 5.2 GHz or 5.7 GHz Canopy devices, Motorola believes that it is highly unlikely that the 5.2 GHz U-NII and 5.7 GHz ISM Canopy devices were modified to operate on frequencies between 5470 and 5725 MHz.

[redacted]

[redacted] PCBAs and disassembled devices for several Canopy products are shown in Photos 1 to 7 below.

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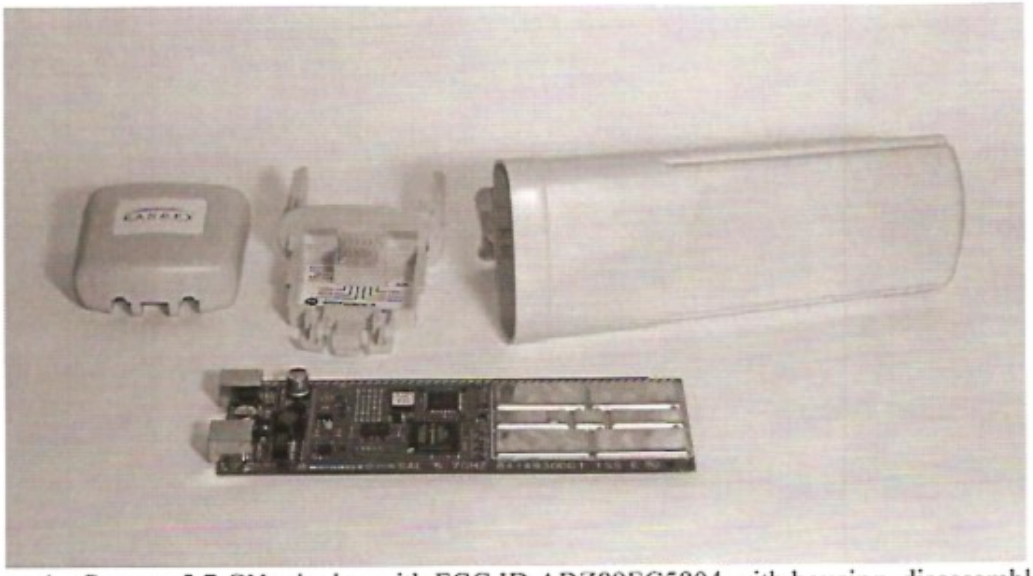

Photo 1. Canopy 5.7 GHz device with FCC ID ABZ89FC5804 with housing, disassembled.

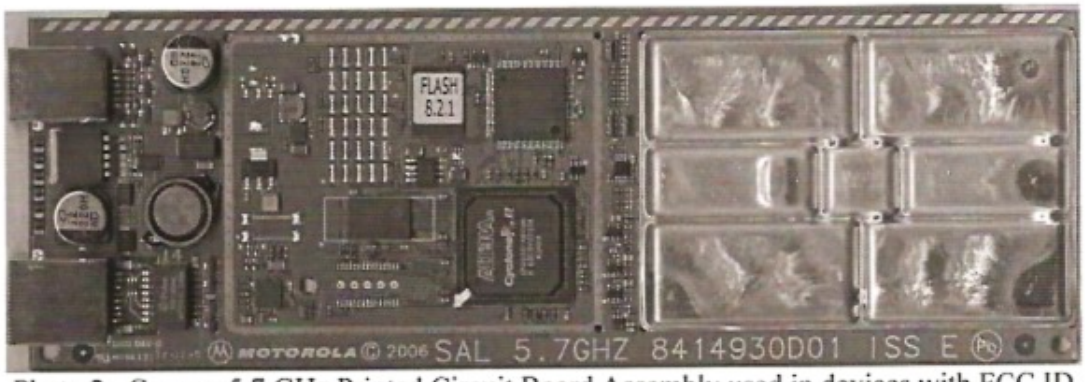

Photo 2. Canopy 5.7 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FC5804, component side.

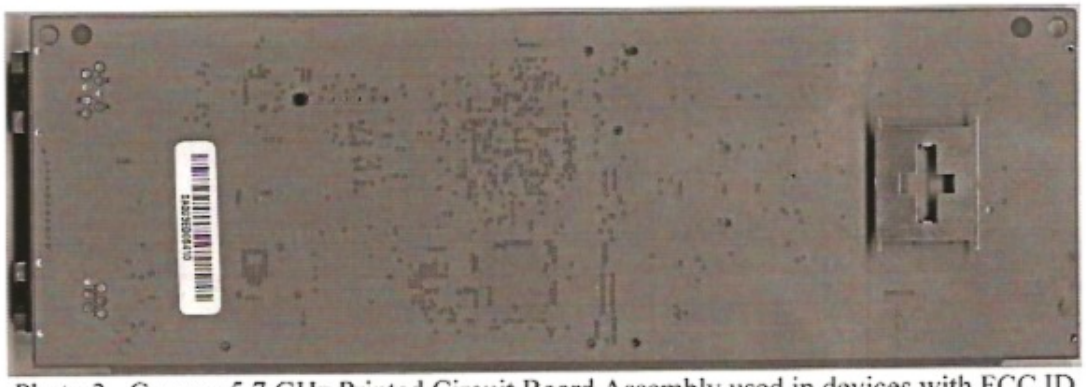

Photo 3. Canopy 5.7 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FC5804, antenna side. Note electronic serial number label on left.

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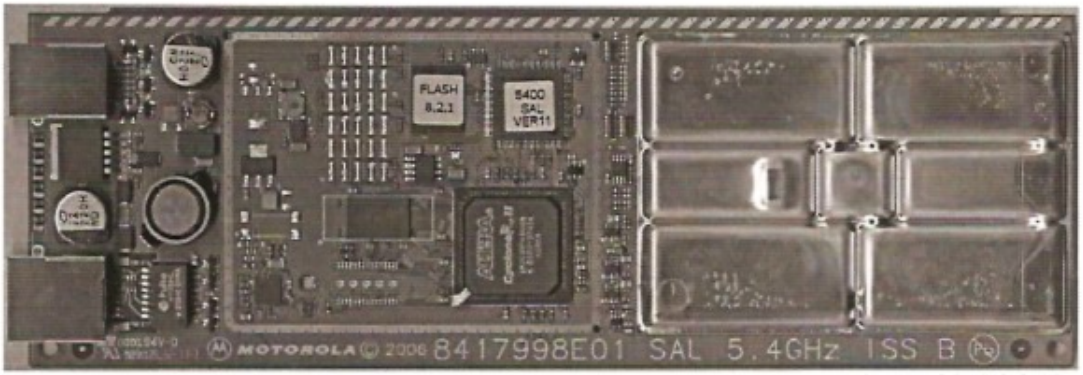

Photo 4. Canopy 5.4 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FT7623, component side.

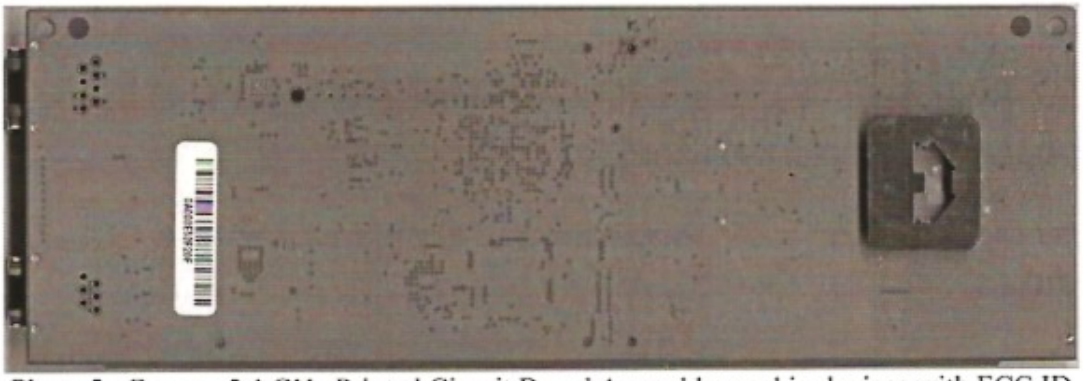

Photo 5. Canopy 5.4 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FT7623, antenna side. Note electronic serial number label on left.

Photo 6. Canopy 5.2 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FC3789, component side.

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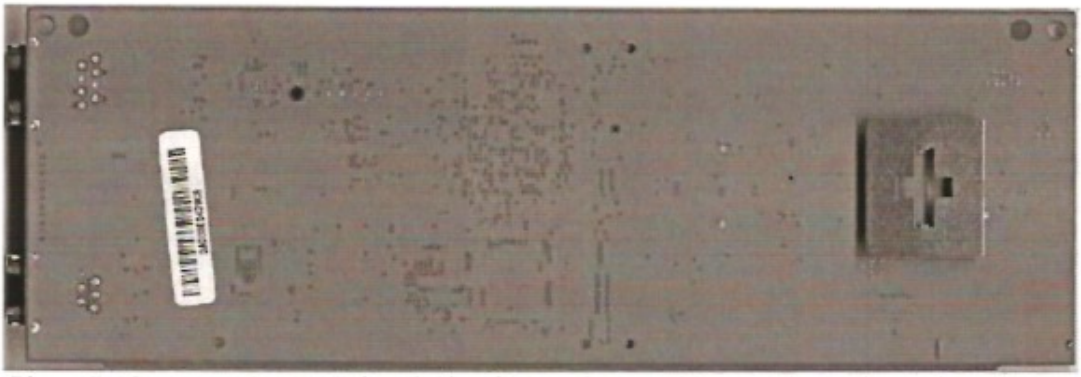

Photo 7. Canopy 5.2 GHz Printed Circuit Board Assembly used in devices with FCC ID ABZ89FC3789, antenna side. Note electronic serial number label on left.

[redacted]

See below Photo 8.

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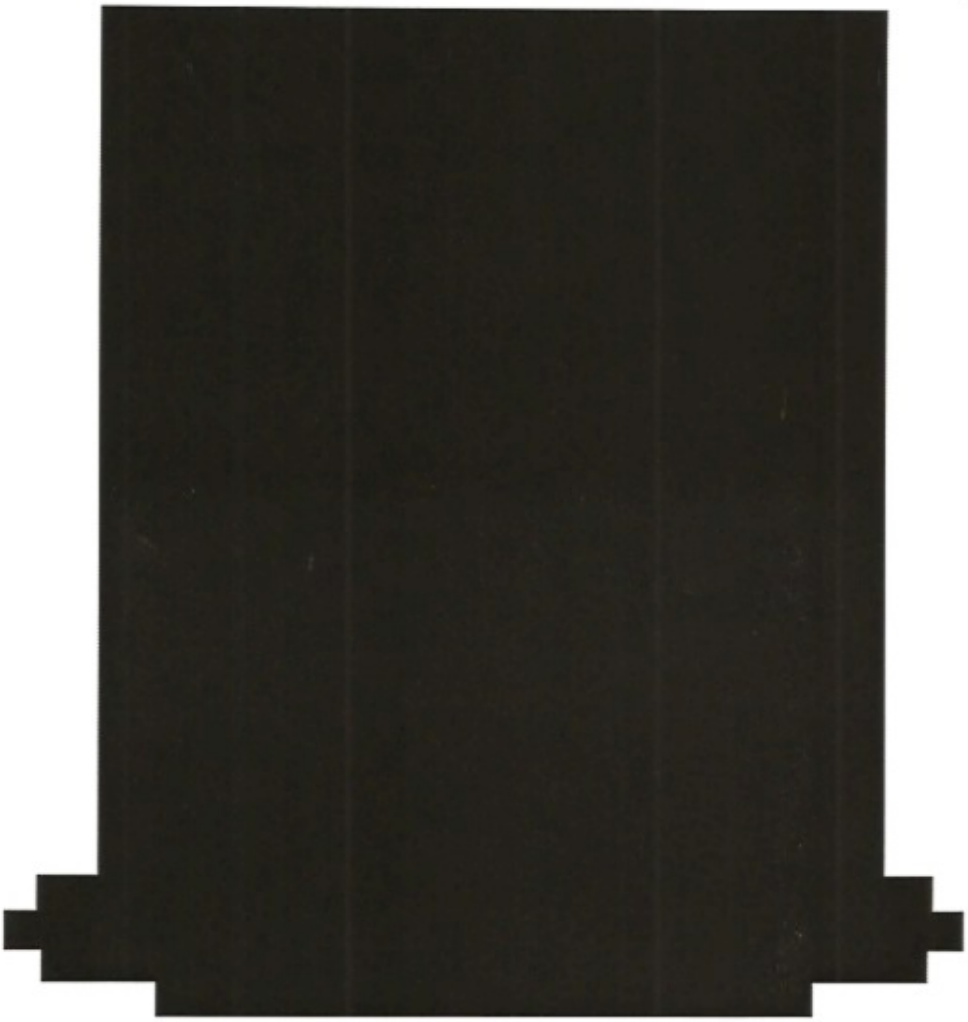

(c) State whether Motorola has had any role in, or has any knowledge of, the modification (either by hardware or software) of any 5.2 GHz or 5.7 GHz Canopy U-NII devices to operate on frequencies between 5470 and 5725 MHz. If so, furnish complete details for each such modification including:

- *(i) The number of devices modified.*
- *(ii) The name, address and telephone number of the modifying party (if other than Motorola).*
- *(ii) Whether Motorola authorized the modification.*
- *(iv) If Motorola authorized the modification, the authority, if any, for the modification.*

RESPONSE: Motorola has had no role in, nor knowledge of, any modification (either by hardware or software) of 5.2 GHz or 5.7 GHz Canopy devices to operate on frequencies between 5470 and 5725 MHz.

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QUESTION NO. 2. *FCC field agents in San Juan, Puerto Rico observed a 5.4 GHz Canopy U-NII device that was labeled with model number 5400BH20 but was not labeled with any FCC ID number. This device was operating on 5460 MHz and was causing interference to the TWDR at the San Juan International Airport. State whether this device is certified. If so, provide the FCC ID number and an explanation as why the device was not labeled as required by section 2.925 of the Rules, 47 C.F.R. § 2.925.*

RESPONSE: [redacted]

QUESTION NO. 3. *FCC field agents in San Juan, Puerto Rico observed 5.2 GHz, 5.4 GHz and 5.7 GHz Canopy devices with antenna arrangements using parabolic dishes in addition to internal antennas. State whether Motorola believes these are approved configurations and, if so, provide an explanation as to why they meet the requirements of sections 15.203 and 15.204 of the Rules.*

RESPONSE: Motorola holds authorizations for a 5.2 GHz U-NII device under FCC ID ABZ89FC5807, a 5.4 GHz U-NII device under FCC ID ABZ89FT7623, and three 5.7 GHz devices under FCC IDs ABZ89FC4816 (U-NII), ABZ89FC5804 (ISM), and ABZ89FT7630 (ISM).

Use of Motorola's 27RD parabolic dish accessory is described in the equipment authorization application for several of these devices, and Motorola maintains that it is a permissible configuration. The installation manuals instruct the professional installer to lower the output power of the devices by the gain of the parabolic dish reflector. *See, e.g.*, pages 55-56 of the "Canopy® Software Release 8.2.7 Release Notes" [CanopyRel827NotesIss1.pdf] in the

[6] Motorola can determine the exact date of manufacture and the distributor address to which the device initially was shipped if the serial numbers on the PCBA and housing base are provided.

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Documents\Canopy directory on DVD2. The addition of the parabolic dish reflector to any of the above Canopy products qualifies as a Class I permissive change in Motorola's view.[7]

A Class I permissive change does not degrade the characteristics relied on by the FCC in making the determination to issue the initial equipment authorization grant. Use of the 27RD dish with any of the above 5 GHz devices in accordance with Motorola's instructions will not degrade in-band or out-of-band performance, consistent with a Class I change. The gain in each band of interest (*i.e.*, ~11 GHz for 2nd harmonic, ~16-17 GHz for 3rd harmonic, etc.) will be consistent regardless of which of the above devices is used to illuminate the dish. Moreover, measurements made with the dish are expressly included in the 5.2 GHz and 5.7 GHz equipment authorization applications and demonstrate compliant operations.

Therefore, so long as the Canopy system is configured to operate at or below the 30 dBm level, per the instruction manual, the in-band and out-of-band performance of the 5.2, 5.4 and 5.7 GHz devices does not degrade when used with the dish. These radios have very similar architectures and, thus, very similar in-band and out-of band performance characteristics. This professionally installed equipment complies with the requirements in FCC Rule Sections 15.203[8] and 15.204. 47 C.F.R. §§ 15.203, 15.204.

Finally, Motorola acknowledges that some vendors offer third-party parabolic dishes as accessories for Motorola Canopy devices, but Motorola does not approve or authorize the use of such equipment.

QUESTION NO. 4. *State whether Motorola has received any complaints or reports indicating that a Motorola U-NII device is causing interference to FAA radar or any licensed radio services. If so, provide full details of such complaints, including the dates the complaints were received, a description of the interference, and the complainants' contact information. In addition, state what actions, if any, Motorola has taken in response to such complaints.*

RESPONSE: The response to this question is broken down by each family of U-NII devices that Motorola manufactures:

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[7] However, in response to a question (#265186) that Motorola posed to the FCC OET knowledge database, the OET Laboratory informed Motorola on March 19, 2009, that use of the 27RD dish with the 5.4 GHz device requires a Class II permissive change application. Motorola posed the question to the FCC after it was raised in a wireless Internet service provider forum. Motorola will submit a Class II permissive change application for FCC ID ABZ89FT7623 shortly.

[8] With regard to compliance with Rule Section 15.203, which requires a unique connector, the dish does not have an electrical coupling. It has a mechanical mount which is attached to the Canopy device with stainless steel worm-drive clamps (hose clamps) to maintain alignment.

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Product Family	Question 4 Response
Canopy	Aside from the LOI, Motorola has not received any complaints regarding Canopy U-NII devices interfering with FAA or any licensed radio services. [redacted]
Orthogon	Motorola's Point-to-point group, which is responsible for this product, has not received any complaints or reports regarding Orthogon devices interfering with FAA radar or any licensed radio services.
Symbol	Symbol Technologies, a Division of Motorola Inc., has not received any complaints or reports regarding Symbol products interfering with FAA radar or any licensed radio services.
Mesh	Motorola's Mesh product group has not received any complaints or reports regarding Mesh devices interfering with FAA radar or any licensed radio services.
Normandy	Motorola's Normandy product group has not received any complaints or reports regarding Normandy devices interfering with FAA radar or any licensed radio services.
AirDefense	Motorola's AirDefense product group has not received any complaints or reports regarding AirDefense devices interfering with FAA radar or any licensed radio services.
Rugged Notebook	Motorola's Rugged Notebook product group has not received any complaints or reports regarding its devices interfering with FAA radar or any licensed radio services.

QUESTION NO. 5. *State whether Motorola is marketing any U-NII devices with user-selectable options to select, either directly or through other software settings, operating parameters including, but not limited to, the ability to disable the DFS radar detection mechanism and the ability to vary the radar-pulse detection threshold. If so, provide the following information for each such device:*

[9] [redacted]

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(a) Specify the model number(s) and FCC ID number.
(b) State the date(s) on which Motorola began marketing the device in the United States, the total number of units of these devices sold and distributed in the United States to the present, the dates on which the units were sold and distributed, and, to the extent known, the identity of the operator and the location where the device is installed.

RESPONSE: Motorola is marketing certain U-NII devices with options that allow a professional installer or systems operator to select various operating parameters. U-NII devices from four of the seven Motorola U-NII product families, as shown in Table R5 below, fall into this category.[10] Table R5 contains FCC IDs and model numbers associated with currently marketed Canopy, Orthogon, Symbol and AirDefense U-NII products with selectable parameters, the dates Motorola began marketing the devices in the U.S., the total number of units sold and distributed in the U.S., and dates the devices were sold and distributed.

While certain of these devices allow a professional installer or system operator to misconfigure DFS radar detection settings and vary the radar pulse detection threshold, such settings would be contrary to FCC regulations and instructions that Motorola provides to professional installers/system operators configuring the equipment for operation in the U.S.[11]

In general, Motorola does not know the identity of the operators or the locations where these devices are installed because the devices are not generally sold directly to end-users. The devices are sold to distributors who interface directly with end-user customers, retailers, and professional installers. [redacted]

[redacted]

[10] Motorola's response covers currently marketed U-NII products. Products from AirDefense, Canopy, Orthogon and Symbol, which are not currently marketed, are not included, nor are devices from Mesh, Normandy and Rugged Notebook as those products do not have options to modify the radio operation. Motorola will provide information relating to U-NII devices that are no longer marketed upon FCC request.

[11] For example, although the installation instructions for certain U-NII products expressly warn the professional installer to follow the regulations that apply to the region where the device is being installed, it is possible for an installer acting contrary to FCC regulations and Motorola instructions to improperly configure a radio for operation in a country that does not require DFS.

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Table R5. Response to LOI Question 5

U-NII Product Family	FCC ID (and associated Model Nos.)	Date First Marketed in U.S.	Total No. of Units Sold/Distrib. in U.S.	Dates Units Were Sold/Distrib. In U.S.
Canopy	ABZ89FC3789	[redacted]	[redacted]	[redacted] to [redacted]
	Model Nos: 5200AP, 5200APBC, 5200APDD, 5200APHZDD, 5200BH, 5200BHBC, 5200BHDD, 5200SM, 5200SMBC, 5200SMDD, 5200SMHZDD, 5200XX, 5200XXA, 5201AP, 5201APBC, 5201APDD, 5201BH, 5201BHBC, 5201BHDD, 5201SM, 5201SMBC, 5201SMDD, 5250AP, 5250APBC, 5250APDD, 5250SM, 5250SMBC, 5250SMDD, 5251AP, 5251APBC, 5251APDD, 5251SM, 5251SMBC, 5251SMDD, 5260SMDD, BP5200BH-4, BP5200BH-4BC, BP5200SM-100, BP5200SM-100BC, BP5200SM-100DD, BP5200SM-25, BP5200SM-25BC, BP5200SM-25DD, BP5200SM-50, BP5200SM-500, BP5250SM-100, BP5250SM-100BC, BP5250SM-25, BP5250SM-25BC, BP5260SM-25DD, BP5271SM-100, BP5273SM-100			
	ABZ89FC5807	[redacted]	[redacted]	[redacted] to [redacted]
	Model Nos: 5210, 5210BH, 5210BH20, 5210BH20BC, 5210BHBC, 5210BHRF, 5210BHRF20, 5210BHRF20BC, 5210BHRF20DD, 5210BHRFBC, 5210BHRFDD, 5211BH, 5211BH20AC, 5211BH20DD, 5211BHRF, 5211BHRF20AC, 5211BHRF20DD, 5211BHRFBC, 5211BHRFDD, 5212BH20, 5212BH20BC, BP5210BHRF20-4, BP5210BHRF20-4BC, BP5210BHRF20-4DD, BP5210BHRF-4, BP5210BHRF-4BC, BP5210BHRF-4DD			
	ABZ89FT7623	[redacted]	[redacted]	[redacted] to [redacted]
	Model Nos: 5400APDD, 5400APHZDD, 5400BH20DD, 5400BHDD, 5400BHRF20DD, 5400BHRFDD, 5400SMDD, 5400SMHZDD, 5401APDD, 5401BH20DD, 5401BHDD, 5401SMDD, 5450APDD, 5450SMDD, 5450SMHZDD, 5451APDD, 5451SMDD, 5460SMBC, 5460SMDD, BP5400SM-100DD			
	ABZ89FT7629	[redacted]	[redacted]	[redacted] to [redacted]
	Model Nos: 5440AA, 5440CAA			

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U-NII Product Family	FCC ID (and associated Model Nos.)	Date First Marketed in U.S.	Total No. of Units Sold/Distrib. in U.S.	Dates Units Were Sold/Distrib. In U.S.
Orthogon	QWP54XX **Model Nos:** All Gemini products, PTP54400	[redacted]	[redacted]	[redacted] to [redacted]
	QWP54500 **Model Nos:** PTP54300/54500	[redacted]	[redacted]	[redacted] to [redacted]
	QWP54100 **Model No:** All Spectra Products, PTP54600	[redacted]	[redacted]	[redacted] to [redacted]
Symbol	UZ7AP7131 **Model No:** AP-7131	[redacted]	[redacted]	[redacted] to [redacted]
	H9PAP5181D **Model No:** AP-5181	[redacted]	[redacted]	[redacted] to [redacted]
	H9PAP5131D **Model No:** AP-5131D	[redacted]	[redacted]	[redacted] to [redacted]
	H9PAP5131S **Model No:** AP-5131S	[redacted]	[redacted]	[redacted] to [redacted]
	H9PCB3000 **Model No:** CB3000	[redacted]	[redacted]	[redacted] to [redacted]
	H9PWSAP5100 **Model No:** WSAP-5100	[redacted]	[redacted]	[redacted] to [redacted]
	H9PWSAP5030 **Model No:** WSAP-5030	[redacted]	[redacted]	[redacted] to [redacted]
Air Defense	HED2555WAG2 **Model No:** 520 Sensor	[redacted]	[redacted]	[redacted] to [redacted]

* FCC equipment grants are dated 5/3/2007, 10/10/2008 and 6/25/2007, respectively. Prior to those dates, some [redacted] (QWP54XX), [redacted] (QWP54500), and [redacted] (QWP54100) were imported for operation pursuant to experimental licenses.

† [redacted] In any event, Symbol did not sell or distribute any product that operates in the 5.25-5.35 GHz band without DFS functionality past the sunset date.

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(c) Provide a detailed description of the user-selectable operating parameters.

RESPONSE: A detailed description of the operating parameters that may be set by professional installers and system operators is included in the manuals for each of the products listed in Table R5. The manuals associated with each product family are identified below and provided in electronic format on DVD2.

Canopy. Manuals for the Canopy products are provided in the Documents\Canopy directory on DVD2. The "Canopy System Release 8 User Guide Issue 1a" [CanopyR8UserGuideIss1.pdf] and "Canopy System User Guide Issue 2" [CanopySystemUserGuideIss2.pdf] documents cover the products with FCC IDs ABZ89FC3789, ABZ89FC5807 and ABZ89FT7623. The "PMP 400 Series Networks PTP 200 Series Bridges Release 8.4.3" [PMP400_PTP200_UserGuideIss2.pdf] document covers product with FCC ID ABZ89FT7629.

The "Canopy® Software Release 8.2.7 Release Notes" [CanopyRel827NotesIss1.pdf] document covers all four listed Canopy products. Pages 16-25 of this document describe how a professional installer or system operator would configure the Canopy device for operation. It contains detailed information on many selectable parameters including country code settings that directly control DFS functionality. The "Canopy® Dynamic Frequency Selection Deployment Guide" [Canopy_DFS_Deployment_Guide[1].Final.pdf], which relates to device configuration for operation in the DFS bands, "Motorola Canopy® 5.4 GHz DFS Frequently Asked Questions" [5[1].4.DFS.FAQ.Final.pdf] and the "Canopy System Glossary" [Canopy Glossary – ACF275.pdf] documents also are provided. For completeness, Motorola provides the "Canopy® Cluster Management Module 4 (CMM4) User Guide" [CanopyCMM4UserGuideIss1a.pdf], which provides guidance to Canopy planners, engineers, installers, and technicians who need to plan, install, configure, and operate the Cluster Management Module, which provides power, synchronization, and network connectivity for the Canopy system.

Orthogon. Manuals for the three Orthogon products identified in Table R5, which describe the operating parameters that may be adjusted by a professional installer or system operator, are provided in electronic form in the Documents\Orthogon directory on DVD2.

Symbol. Manuals and related documents for the seven Symbol products identified in Table R5, which describe the operating parameters that may be adjusted by a professional installer or system operator, are provided in electronic form in the Documents\Symbol directory on DVD2.

AirDefense. The Model 520 Sensor Installation Guide is provided in the Documents\AirDefense directory on DVD2. The guide describes the operating parameters that may be adjusted by a professional installer or system operator.

(d) Provide a copy of any user or operating manual that describes how the user may select the operating parameters.

RESPONSE: Copies of the manuals associated with each of the products identified in Table R5 are provided on DVD2, as noted in the response to question 5(c).

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(e) State the basis of Motorola's belief that the user-selectable operating parameters are consistent with Motorola's certification for the devices and section 15.407(h)(2) of the rules.

RESPONSE: The operating parameters for the devices identified in Table R5 are consistent with the FCC certification for the devices and Rule Section 15.407(h)(2) of the rules. As described below with respect to Motorola's Canopy, Orthogon, Symbol, and AirDefense U-NII product families, each of the devices requires professional installation and restricts the ability of end-users to modify any parameters relating to U-NII radio operation (in accordance with FCC rules).

Section 15.407(h)(2) requires that U-NII devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz bands employ a DFS radar detection mechanism to detect the presence of radar systems and avoid co-channel operation with such systems. *See* 47 C.F.R. § 15.407(h). [redacted]

Canopy. Motorola's Canopy systems must be professionally installed. The Canopy product information that is provided to professional equipment installers is fully consistent with the information provided to the Commission when the devices were authorized. All configurable parameters associated with the Canopy family of products are controlled under password protection by professional installers and system operators. There are no operating parameters relating to radio operation that the end-user can modify. Moreover, the Canopy devices identified above are infrastructure devices (*e.g.*, access points, backhauls) that are deployed in secure locations with physical access restrictions, such as communications towers, building rooftops, etc., that are not typically accessible to end-users or the public at large.

The Canopy products identified above have two software-selectable settings related to DFS operation which the professional installer or system operator is required to set correctly to ensure compliance with the appropriate regulations. These settings are:

- Region code. The "region code" parameter determines which of the various DFS radar profiles will be used for detection. It also determines the frequencies at which the device will operate. The default setting is "None." A device whose region code is set to "None" will not transmit. Before the device is able to transmit, the operator must select the appropriate "region code," which would be the U.S. for FCC compliant operation.[12]
- External antenna gain. The "external antenna gain" parameter accounts for gain of the different antennas that can be employed with Canopy devices. The "external antenna gain" parameter allows the operator to scale the detection threshold with antenna gain in

[12] Although the installation instructions for the Canopy products expressly warn the professional installer to follow the regulations that apply to the region where the device is being installed, it is possible for an installer acting contrary to FCC regulations and Motorola instructions to improperly configure a radio [redacted]

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order to set system performance and ensure compliance with appropriate regulatory requirements. The default setting is based on the antenna configuration of the particular model as it ships from the factory.

Other selectable parameters related to radio operation that may be configured by the professional installer or system operator include:

- 2X Rate (FSK radios only) – The 2X Rate parameter, when enabled, allows the radio to operate in 4-level FSK modulation.
- Dynamic Rate Adapt (OFDM radios only) – This parameter allows the operator to select which modulations are allowed: 1X (QPSK only), 1X/2X (QPSK or 16QAM), or 1X/2X/3X (QPSK or 16QAM or 64QAM)
- Radio Frequency Carrier – This parameter allows the operator to select the frequencies upon which the device will operate in the band.
- Color Code – This parameter is a system management feature that allows the operator to define the subscriber modules that can access a particular access point.
- Max Range – This parameter limits the maximum distance that a communicating subscriber module can be located from an access point.
- Downlink Data – This parameter specifies the percentage of the aggregate throughput allocated for downlink traffic from the access point to the subscriber modules.
- Transmit Frame Spreading (FSK only) – With this selection enabled, the AP does not transmit a beacon in each frame, but rather transmits a beacon in only pseudo-random frames in which the subscriber modules expect the beacon. This allows multiple access points to send beacons to multiple subscriber modules in the same range without interference.
- Transmitter Output Power – Allows for the reduction of the transmit power of the device from its maximum value, which is used to account for additional antenna gain or to reduce cell area.
- Schedule Whitening (FSK only) – "Whitening" is a transmission technique that changes the energy pattern so as to avoid peaks that could be interpreted as radar and trigger DFS. Whitening is not part of the DFS specification, but rather is a technology used by Canopy to reduce the likelihood of false DFS detections from self interference.

Orthogon. The Orthogon systems identified in Table R5 above must be professionally installed. The operating parameters of the Orthogon Point-to-Point ("PtP") products are controlled by region-specific license keys. The keys, which are issued by Motorola and are unique to each radio serial number, are linked to the radio's MAC address and cannot be used on radios other than those for which the keys were created. The radios intended for operation in the 5.470-5.725 GHz band, which require DFS functionality, are shipped by Motorola with several alternate region specific license keys.[13]

[13] Professional installers and system operators may download specific region keys as needed for operation in other locations.

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- One license key configures the product to operate in the appropriate region (*e.g.*, FCC-U.S.), which enables radar detection pursuant to FCC rules.

- The second license key configures the product to operate in other regions where radar detection is required, covering operation in Canada and Australia. The radar detection performance of the product with this second key is the same as for the FCC Region code except that this key does not allow operation in the 5.600-5.650 GHz band (which is sometimes referred to as the Weather Radar sub-band). This license key is therefore more restrictive than the FCC key.

- A third license key configures the product to operate in Europe where radar detection is required. While performance under this key currently is the same as for the second license key, this third key was created to allow for expected changes that will be needed to comply with upcoming modifications to the European regulations.

As an example, the region code setting for the QWP54XX device is provided in Section 5.2 of the Orthogon manual [QWP54XX_Manual_phn-0872_002v015.pdf] in the Documents\Orthogon directory on DVD2:

Section 5.2 states:

> The PTP 400 Series Bridge uses a system of Region Codes to control the operation of the radio link. The Region Code is set by a License Key.

Beneath the Table of region codes, the manual states:

> When shipped from the factory, units are configured as follows:
> ...
> 5.4 GHz PTP 400 Series Bridge – Region Code 9 [FCC-compliant operation]

The manual also warns the installer that may be configuring links in a region different from that where the device was purchased:

> ⚠ **WARNING** To meet the regulatory requirements of your region you should set the correct Region Code by obtaining a new License Key from your reseller or distributor.

There are no means through which the professional installer can modify the pre-set radar detection functionality or detection levels for a particular region code. However, the installer can reduce the maximum conducted power level from the default level defined by the region code/licence key to comply with EIRP limits when deploying links with higher gain external antennas. Because the detection threshold in the receiver remains fixed, higher gain antennas actually provide improved radar detection.

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The installation instructions expressly warn the professional installer to follow the regulations that apply to the region where the device is being installed. [redacted]

Notably, the device will not transmit at all if license keys are missing or miskeyed. Aside from the warnings in the manuals, the sample license key website screen provided on the following page warns the installer when an improper region code is entered for operation in the U.S.

[14] *See, e.g.,* Motorola PTP Licenses and Region Codes *available at* http://motorola.motowi4solutions.com/support/ptp/regioncodes.php.

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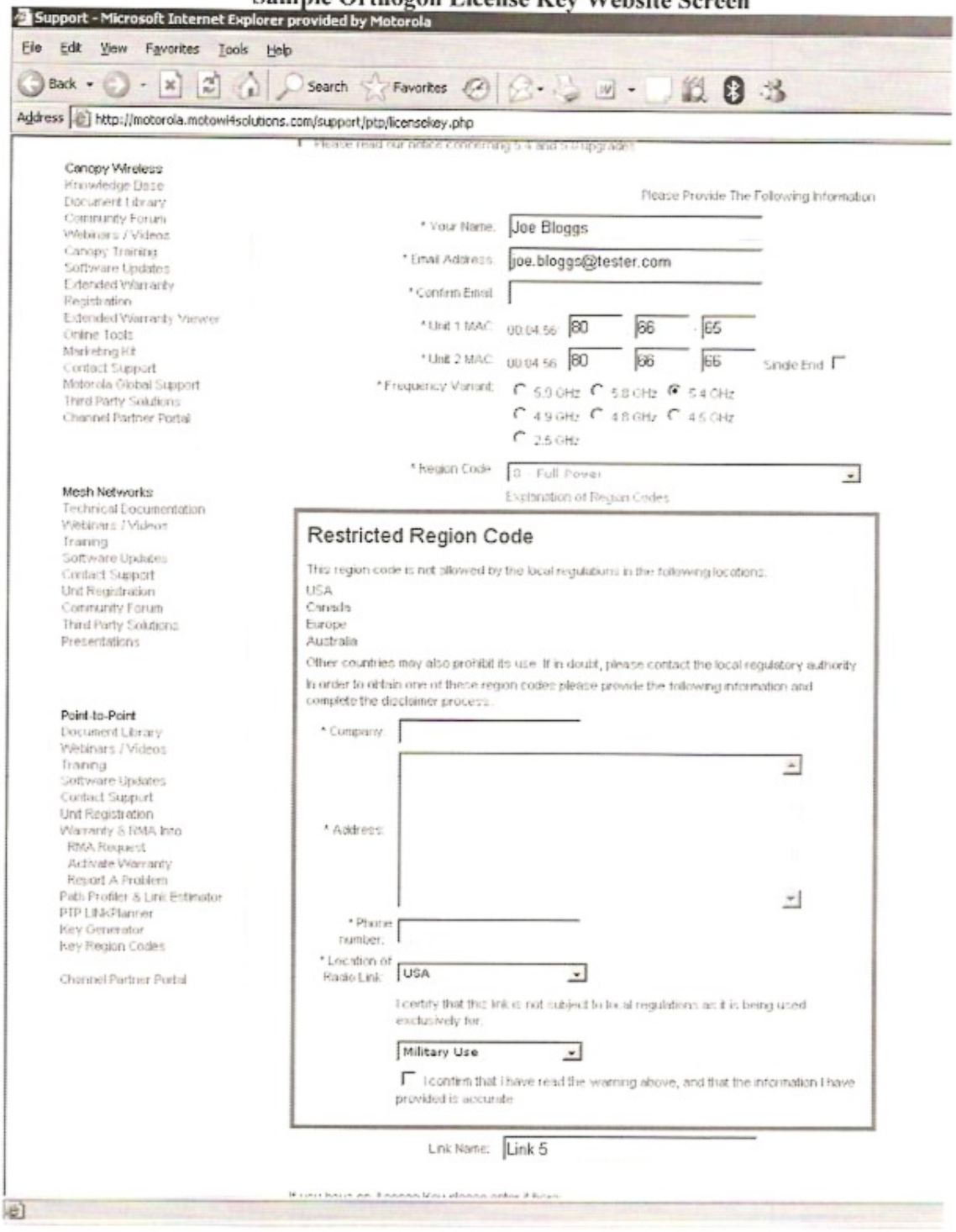
Sample Orthogon License Key Website Screen



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Symbol. Symbol Technologies U-NII products do not have any "user-selectable" settings relating to transmitter operating parameters or DFS settings. DFS operating parameters are hard coded and not accessible to non-Symbol personnel.

All Symbol products are sold to and used in commercial and industrial environments and require professional installation. They are not marketed or sold to the general public via retail sales channels. Symbol's customer base includes [redacted] and its products are used by employees of these businesses and are not resold to the public. Such employee users of Symbol products are denied access to the set up and configuration areas of the products.

Symbol products operate in a master-client configuration. All controls for the master devices are behind a password protected firewall. Symbol provides a variety of handheld data terminals and wireless barcode scanners, which are classified as IEEE 802.11d compliant DFS client devices, with no ad-hoc capability in the U-NII bands.[15] The client devices must detect an active master device before they will transmit.

During the initial setup, the professional installer is required to create a new password to maintain security. Device setup, configuration, and maintenance is done by a Symbol Technologies' service organization or third party contractor.

Setup and installation of a Symbol system requires specialized site surveys and external computers and includes:

- Adjustments for various antennas in the products portfolio;
- Resetting the password on initial configuration;
- IP configurations;
- Country selection –configures the operating bands and limits on transmit power; and
- WEP (Wired Equivalent Privacy) security.

AirDefense. AirDefense markets and sells an innovative wireless security system. [redacted]

There are no end-user selectable parameters that would affect the device's transmission settings. Country codes are input by a professional installer or systems operator via a password-protected interface. The Model 520 Sensor System uses the country code information to select appropriate bands and power levels. The device has no settings related to DFS functionality, as the Model

[15] IEEE 802.11d is an amendment to the IEEE 802.11 specification that provides support for additional regulatory domains via the addition of a country element information. The country information elements simplifies the creation of 802.11 wireless access points and client devices that meet the different regulations enforced in various parts of the world. The amendment is part of the published IEEE 802.11-2007 standard.

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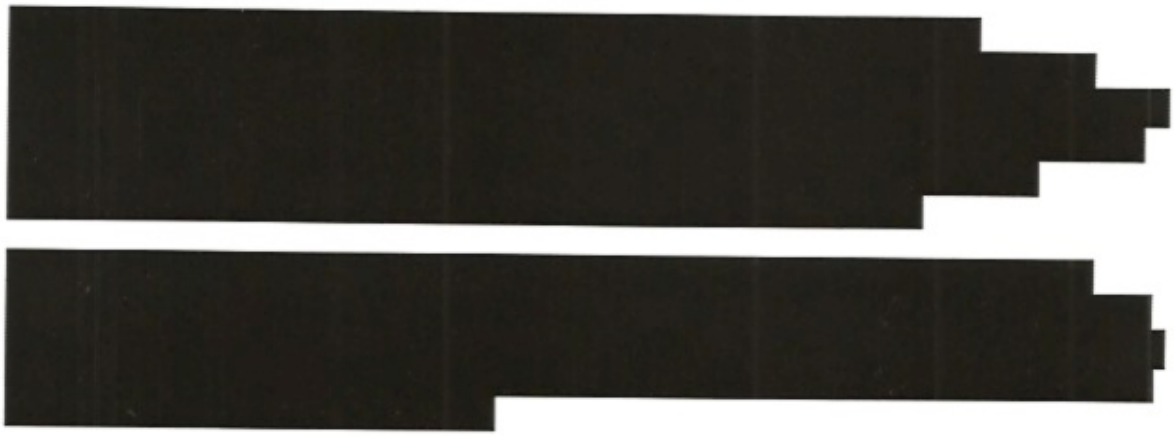
520 Sensor currently operates outside of bands requiring such functionality. Thus, when the device is configured for U.S. operation, it does not transmit in the 5250-5350 MHz band.



The Model 520 Sensor System combats the following attacks:

1. Unauthorized Access Points (APs) detected as physically attached to a private wired network (this access point is called a rogue-on-the-network);
2. Unauthorized client attacks improperly connecting to an authorized wireless network of APs. The system can detect up to several hundred types of wireless attacks, including but not limited to: reconnaissance (ad hoc stations, rogue APs, open/misconfigured APs), sniffing (dictionary attacks, leaky APs, WEP/WPA/LEAP cracking), masquerade (MAC spoofing, evil twin attacks/Wi-Phishing attacks), insertion (man-in-the-middle attack, and multicast/broadcast injection) and denial-of-service attacks (disassociation, duration field spoofing, RF jamming); and
3. Authorized clients and authorized APs; to handle internal policy or misuse scenarios, including cases where authorized clients are improperly attaching to unauthorized APs.

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Annex A – [redacted]

Summary. [redacted]

Background. [redacted]

[redacted]

[redacted]

Root cause. [redacted]

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Scope. [redacted]

Remediation and other actions taken. [redacted]

[redacted]

[redacted]

[redacted]

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Annex B – [redacted]

[redacted]

Background. [redacted]

[redacted]

Remediation. [redacted]

Scope. [redacted]

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