BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	
Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules	ET Docket No. 10-236
2006 Biennial Review of Telecommunications Regulations – Part 2 Administered by the Office Of Engineering and Technology (OET)	ET Docket No. 06-105

COMMENTS OF LOCKHEED MARTIN CORPORATION

I. Introduction and Summary.

Lockheed Martin Corporation strongly supports the Federal Communication Commission's goal of promoting wireless innovation and efficiency in the Part 5 Experimental Radio Service.[1] Lockheed Martin researches, designs, develops, manufactures, and integrates advanced technology systems, products, and services in a broad range of areas. Numerous Lockheed Martin systems, solutions, and platforms use wireless spectrum in innovative ways, for both federal and non-federal users.

The forward-looking rules the FCC established for the Part 5 Experimental Radio Service have contributed to Lockheed Martin's ability to offer a wide range of innovative products and services. Indeed, flexible experimental licenses with clear rules and a predictable application

[1] *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules; 2006 Biennial Review of Telecommunications Regulations – Part 2 Administered by the Office Of Engineering and Technology (OET)*, ET Docket Nos. 10-236, 06-105, Notice of Proposed Rulemaking (rel. Nov. 30, 2010) ("NPRM" or "Notice").

process are critical for developing and testing new ideas for spectrum use/applications. Lockheed Martin therefore thanks the Commission for examining how it can improve these rules and suggests three ways that the FCC can accelerate innovation and promote additional development of wireless applications and services.

First, the Experimental Radio Service should establish coordination requirements that strike the appropriate balance between enabling flexible use and protecting incumbents. To do so, the FCC should make clear that incumbent operators may not refuse to coordinate with experimental licensees unless there are legitimate, objective concerns about harmful interference. Incumbents' ability to block development of new wireless applications or services by delaying or denying coordination is exactly the type of roadblock to wireless innovation that the Commission should remove through this proceeding.

Second, the FCC should enable experimentation without imposing separate licensing requirements in environments where there is negligible risk of harmful interference. Specifically, the Commission should codify its longstanding practice of permitting experiments in anechoic chambers and Faraday Cages without additional authorization. It should also approve experimental use of devices capable of operating on Part 15 frequencies without obtaining a separate authorization *provided* that they conform to the maximum power levels and other parameters required for certified devices.

Third, the FCC should streamline the application process by omitting unnecessary license restrictions, including the requirement that applicants specify particular make and model numbers for non-experimental commercial-off-the-shelf equipment. The Commission should also decline to impose restrictive grant conditions in cases where the applicant's experiments are conducted in furtherance of a U.S. government contract.

By taking these steps, the Commission can further its goal of developing advanced devices and services that will "promote economic growth, global competitiveness, and a better way of life for all Americans."[2]

II. Coordination Requirements Should Both Enable Innovation and Protect Incumbents.

The most important action the Commission can take in this proceeding to promote innovation is to identify and remove obstacles that needlessly delay experimentation—or that prevent it from taking place entirely. As Lockheed Martin explained in the *Wireless Innovation NOI* proceeding, there is a gap in the existing Part 5 rules that permits incumbent licensees to reject experimental coordination requests for any reason, even in cases where there is no concern about harmful interference.[3] The Commission should act now to provide additional guidance to licensees regarding coordination obligations.

In Lockheed Martin's experience, most incumbents are willing to accommodate coordination requests, and most coordinations are concluded without incident. Nevertheless, the record in the *Wireless Innovation NOI* proceeding illustrates that obtaining coordination is becoming more difficult. Some denials of coordination have been particularly egregious, including instances in which incumbents have refused to coordinate *even though they had not yet built out their networks*.[4] Clearly, if an incumbent has not built out its network and there are no geographic trials, there is no risk of harmful interference with that network, and the incumbent licensee should allow experimentation. Baseless denials of coordination undermine innovation –

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2 NPRM ¶ 1.

3 *See* Comments of Lockheed Martin Corporation, GN Docket Nos. 09-51 and 09-157, at 4 (filed Sept. 30, 2009) (citing 47 C.F.R. § 5.85) ("Lockheed Wireless Innovation Comments").

4 *See* Reply Comments of the Boeing Company, GN Docket Nos. 09-51 and 09-157, at 2-3 (filed Nov. 5, 2009).

when entities cannot obtain coordination, they are forced to delay, or even abandon, promising avenues of experimental development.

This is the appropriate proceeding for the Commission to amend its rules to make clear that incumbents may not refuse to coordinate absent objective concerns about harmful interference. Establishing clear rules for coordination procedures will provide greater certainty for both experimental licensees and incumbents. Moreover, as Lockheed Martin has previously explained, doing so will promote innovation by removing the incentive for incumbents to disfavor the development of certain types of technologies that could be viewed as competitive with the incumbents' technology choices.[5] Finally, because experimental licensees must always operate on a non-interfering basis, and because the coordination process addresses legitimate issues involving harmful interference, incumbents will still receive the interference protection to which their licenses entitle them.

III. The Commission Should Enable Experimental Operations Without Imposing Additional Licensing Requirements in Situations Where There is Negligible Risk of Harmful Interference.

Lockheed Martin enthusiastically supports the Commission's efforts to craft rules that will "make it easier for products and devices to be tested while still providing necessary protection against harmful interference."[6] The Commission can further this goal by identifying operating conditions that pose little to no risk of harmful interference and removing the requirement that entities go through a separate experimental license application and approval process in those situations.

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[5] Lockheed Wireless Innovation Comments at 4-5.

[6] NPRM ¶ 81.

A. The FCC should codify its longstanding practice of permitting experimentation in anechoic chambers and Faraday Cages without additional authorization.

As the *Notice* recognizes, the Commission has long advised entities that experimental operations within anechoic chambers or Faraday Cages do not require an experimental authorization, even though the rules do not specifically address these situations.[7] For many entities, anechoic chambers and Faraday Cages are critical tools for developing and testing wireless applications. Accordingly, Lockheed Martin fully supports the Commission's proposal to codify the existing practice of enabling experimentation in these environments without requiring separate applications for authorization, and agrees that doing so will greatly facilitate testing while still protecting incumbents.[8]

The Commission should not, however, mandate compliance with a specific standard for shielding or impose similar construction requirements.[9] As far as Lockheed Martin is aware, the Commission's guidance enabling experimentation in anechoic chambers and Faraday Cages has never included any specific requirements regarding shielding thickness or other design specifications. Rather, the Commission has relied on the fact that such environments are highly unlikely to cause harmful interference, and that the entities conducting such experiments are still required to ensure that they operate on a non-interfering basis. This should continue to be the criteria for experiments performed in anechoic chambers and Faraday Cages as the Commission formalizes this longstanding practice.

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7 NPRM ¶ 82.

8 *Id.*

9 *See id.*

B. The FCC should enable experimentation under Part 5 at or below the Part 15 power limits without requiring additional authorization.

Lockheed Martin also supports the *Notice*'s suggestion that radiofrequency devices could be permitted to operate on an experimental basis at or below the maximum transmit power for Part 15 devices without obtaining a separate authorization.[10] The Commission has already invested substantial time and energy to establish operating parameters that enable commercial or mass production devices to operate in certain environments without a license because they are deemed unlikely to cause interference. The Commission can now leverage this work to encourage greater innovation in the Experimental Radio Service by permitting experimental devices to operate consistent with the Part 15 rules without obtaining a separate authorization.

To build the strongest regulatory foundation for innovation, the Commission should ensure that the rules are flexible enough to support a wide range of experiments. Most importantly, it should not restrict permission to operate lower-power experimental radios to "trade shows," but rather permit such operations more broadly, including all environments where the devices operate consistent with Part 15 frequency assignments, power limits, and other applicable Part 15 rules. Moreover, the Commission should not place any additional operational limitations on such experiments beyond those that are already contained in Part 15. For example, the Commission should not restrict operations to indoor use, or restrict use while in motion, if those requirements do not apply to similar classes of devices under Part 15. The Part 15 rules have well-designed limitations that have been successful in real world environments in many frequency bands. The Commission should rely on these proven rules to protect against harmful interference in this context as well.

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[10] NPRM ¶ 84.

IV. The FCC Should Streamline the Experimental Authorization Process by Eliminating Unnecessary License Restrictions.

Finally, the FCC should streamline the Experimental Radio Service authorization process by removing two administrative requirements that often necessitate multiple license applications, amendments, or clarifying correspondence. These obligations do not provide additional protection from harmful interference, thereby creating "unnecessarily burdensome checks on robust experimentation."[11]

A. The FCC should expressly permit licensees to substitute commercial-off-the-shelf equipment used in experiments as long as doing so is not otherwise inconsistent with the authorization.

The Commission's rules call for a Part 5 applicant to provide specific information regarding equipment to be used in an experiment.[12] Accordingly, both Form 442 and the Commission's Application for Special Temporary Authority ("STA") require the applicant to specifically identify all transmitting equipment, including the manufacturer and serial number. Significantly, however, the forms do not distinguish between experimental equipment and "commercial-off-the-shelf" ("COTS") equipment. This requirement is unnecessary for COTS equipment and should be eliminated.

Experiments routinely employ non-experimental, commercially available signal generators and other transmitting equipment. This equipment is often fungible, enabling licensees to swap it for other non-experimental COTS equipment during the course of an experiment. But because the FCC's applications require even non-experimental COTS equipment to be specifically identified when authorized under an experimental license or STA, a

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[11] *Id.*

[12] *See* 47 C.F.R. §§ 5.55(c); 5.61(c)(7).

licensee arguably must inform the FCC each time the licensee intends to upgrade or replace the equipment, even though the reported performance characteristics do not change.

Experimental licenses mandate very specific operating parameters, including frequency, output power, location, emissions designators, and modulating signals. And the Commission's rules already permit licensees to make changes to transmitters "without specific authorization from the Commission provided that the change does not result in operations inconsistent" with the terms of the authorization.[13] As long as the licensee complies with those requirements, the FCC should amend its rules and application forms and instructions so that they no longer require specific manufacturer identification of any COTS equipment used. Alternatively, the FCC should clarify that COTS equipment can be substituted during the term of the authorization, provided that it otherwise complies with the requirements of the license. Doing so will reduce administrative burdens and will not lead to any additional risk of harmful interference.

B. The existence of government contracts should not result in restrictive default conditions for licenses.

The Commission can also remove unnecessary burdens by changing its default practice of issuing special grant conditions that restrict experimentation when an applicant discloses that its experiments support a U.S. government contract. Government contract fulfillment is one of the ten categories of operations listed in the Commission's rules as a permissible experimental use.[14] Accordingly, Form 442 requires the applicant to identify whether the authorization will be used to fulfill a requirement of a government contract. If so, the applicant must submit a narrative describing the project and identifying the agency and contract number.[15] When the

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[13] 47 C.F.R. § 5.77.

[14] 47 C.F.R. §5.3(b).

[15] *See* 47 C.F.R. § 5.63(b).

applicant provides this information, however, the resulting authorization then typically includes a special grant condition restricting the licensee from operating the authorized radio stations "in any other manner or for any other purpose" than those expressly required by the contract.

Although fulfillment of a government contract is included as a specific scope of service under Part 5, the FCC often authorizes experimental licenses under multiple scopes of service.[16] While there are some instances where coordination requirements in federal or shared bands that contain especially sensitive operations will necessitate restricting experimental transmissions only to those necessary to fulfill a government contract, there are other instances where the spectrum can support developers who are working both toward meeting the specific requirements of a contract and on related independent activities designed to advance the state of the art. If this is the case, the applicants must submit multiple duplicative authorizations or request administrative changes to the original authorization to modify the grant condition. This default rule should be eliminated if an applicant requests authority for experiments that include, but are not limited to, fulfillment of government contracts.

V. Conclusion.

The Commission's experimental licensing rules have been an important catalyst for developing a wide range of innovative wireless technologies. Lockheed Martin shares the Commission's view that creating additional flexibility for spectrum use in the Experimental Radio Service will promote even greater advances in the future. By taking the steps outlined above, the Commission can help ensure that its Part 5 rules support the experimentation needed to turn great ideas into new technologies.

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[16] For example, licenses can be authorized both for testing equipment in connection with production or regulatory approval under 5.3(g) as well as development of radio technique or equipment for an existing or proposed service under 5.3(i).

Respectfully submitted,

/s/ Paul Margie

Jennifer A. Warren
Giselle Creeser
LOCKHEED MARTIN CORPORATION
2121 Crystal Drive
Suite 100
Arlington, Virginia 22202
(703) 413-5970

Paul Margie
S. Roberts Carter
WILTSHIRE & GRANNIS LLP
1200 Eighteenth Street NW
Suite 1200
Washington DC 20036
(202) 730-1300

Counsel for Lockheed Martin Corp.

March 10, 2011