

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of
Request by Progeny LMS, LLC for Waiver of
Certain Multilateration Location and Monitoring
Service Rules
Progeny LMS, LCC Demonstration of
Compliance with Section 90.353(d) of the
Commission's Rules
WT Docket No. 11-49

ORDER

Adopted: June 5, 2013

Released: June 6, 2013

By the Commission:

I. INTRODUCTION

1. This Order addresses the request by Progeny LMS, LLC ("Progeny") that we allow it to commence commercial operations of its position location service network. Progeny, a multilateration location and monitoring service ("M-LMS") licensee, plans to deploy a highly accurate location service, which it states will provide both precise outdoor and in-building location information, including improved delivery of E 911 emergency services that can bring significant public safety benefits. Progeny has submitted field tests to meet the condition associated with its licenses to demonstrate that its planned commercial operations will not cause "unacceptable levels of interference" to unlicensed devices operating under Part 15 of the Commission's rules in the 902-928 MHz band. Based on our review of these field tests and the record before us, and consistent with previous Commission decisions with respect to use of this spectrum by M-LMS licensees (including specific decisions regarding Progeny) and unlicensed operations, we conclude that Progeny may commence commercial operations of its position location service network. We will monitor ongoing developments as Progeny continues to deploy its network and commences commercial operations, and condition our approval of commercial operations on Progeny's providing public notifications concerning its ongoing deployment; establishing processes for addressing interference concerns that may arise; and submitting reports over the next 18 months regarding any interference complaints that it may receive. Commission staff will closely monitor progress on an ongoing basis and stand ready to take any steps necessary to promote the co-existence of M-LMS and unlicensed operations in this band.

1 See, e.g., Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, "Progeny LMS, LLC Demonstration of Compliance with Section 90.353(d) of the Commission's Rules, WT Docket No. 11-49" (Jan. 26, 2012) (Progeny Request); Response of Progeny LMS, Inc., WT Docket No. 11-49 (Jan. 11, 2013) (Progeny Response).

2 See, e.g., Progeny Response at ii.

3 47 C.F.R. § 90.353(d).

2. Progeny is deploying a wide-area positioning system to provide more precise location services in areas where Global Positioning System (“GPS”) and other existing services may not work effectively, particularly indoors and in urban canyons.<sup>4</sup> Progeny’s system is intended to serve both public safety and commercial market needs.<sup>5</sup> Operating at the power levels prescribed by the Commission for M-LMS service but only using approximately half of Progeny’s eight megahertz of licensed spectrum, Progeny’s network employs a highly synchronized beacon system to transmit signals to mobile devices (such as cell phone handsets) that can compute more precisely the user’s indoor or outdoor location.<sup>6</sup>

3. Working Group 3 of the Commission’s Communications Security, Reliability and Interoperability Council (“CSRIC”), which has been examining emergency location technologies for indoor wireless E 911, recently conducted location accuracy testing of Progeny’s location technology (among others).<sup>7</sup> The working group’s report found that Progeny’s system demonstrated improved indoor location capabilities, including improved accuracy in the horizontal dimension and, for Progeny’s system in particular, substantial progress in the vertical dimensions (approximate floor-level accuracy), which could be an important factor in locating indoor callers in urban and dense multistory buildings.<sup>8</sup> In addition, a number of public safety organizations, including NENA: The 911 Association, the International Association of Chiefs of Police, the National Sheriffs’ Association, and the International Association of Firefighters, have made filings stating that indoor location technology is critical to first responders. They argue that improved location service could provide rapid and accurate location information for callers in large, multi-story buildings, including floor elevation information, which could speed response and help keep first responders safe.<sup>9</sup> NENA states that technologies such as Progeny’s represent a tremendous opportunity to enable immediate and dramatic improvements in wireless location accuracy.<sup>10</sup> A coalition of national consumer advocacy organizations for the deaf and hard of hearing also encourages the Commission to promote improved location technologies that can significantly increase the

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<sup>4</sup> See generally Progeny Request, Attachment 1 at 1-2; Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, *Ex Parte*, WT Docket No. 11-49 (Mar. 21, 2013) at 1 & Slides at 2-3.

<sup>5</sup> See, e.g., Progeny Request, Attachment 1 at 8-9.

<sup>6</sup> See *id.* at 1-4 & Attachment 1 at 1-6.

<sup>7</sup> See CSRIC Working Group 3 E9-1-1 Location Accuracy, Indoor Location Test Bed Report (Mar. 14, 2013). In the report, Progeny’s system is referenced as the NextNav system.

<sup>8</sup> *Id.* at 8-9 & 24-39.

<sup>9</sup> See, e.g., Letter from Bart R. Johnson, Executive Director, International Association of Chiefs of Police, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Mar. 29, 2013); Letter from Adam D. Kennard, Executive Director, National Sherriffs’ Association, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Apr. 3, 2013); Letter from Harold A. Schaitberger, General President, International Association of Fire Fighters, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Mar. 25, 2013); Letter from Lisa Hoffman, Deputy Director, Division of Emergency Communications, San Francisco Department of Emergency Management, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Mar. 25, 2013); Letter from Dominick Marino, President, Professional Firefighters Association of New Jersey, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Apr. 3 2013).

<sup>10</sup> See Letter from Telford E. Forgety, III, Director of Government Affairs & Regulatory Counsel, NENA: The 9-1-1 Association, to Julius Knapp, Chief Engineer, Office of Technology, Federal Communications Commission, WT Docket No. 11-49 (Mar. 25, 2013).

effectiveness of 911 for Americans who are deaf, deaf-blind, hard of hearing, or deaf with a mobile disability who make emergency calls over voice and text.<sup>11</sup>

## II. DISCUSSION

4. The 902-928 MHz band is used by a variety of licensed and unlicensed operations. Recognizing this diversity and the unique challenges it presented, the Commission has provided a framework to promote the use in the band of the various permitted operations. In this Order, the Commission addresses M-LMS licensees and Part 15 users of this spectrum. As we discuss below, the Commission expects M-LMS licensees and Part 15 users of this spectrum to work cooperatively to identify and take reasonable steps to mitigate interference so that both licensed and unlicensed operations can continue to use the band.

5. In this Order, we first describe the Commission's framework for M-LMS operations in the 902-928 MHz band. We then discuss the 2011 *Limited Waiver Order*, issued by the Wireless Telecommunications Bureau ("WTB") and Office of Engineering and Technology ("OET"), which, by granting a limited waiver of the rules, lowered the potential for interference from Progeny's operations in the band while also establishing a transparent process for ensuring that Progeny meets the Commission's field testing requirement prior to commencing commercial operations.<sup>12</sup> We next describe the results of the field testing. Finally, we discuss our decision to condition approval of Progeny's request on its compliance with certain reporting requirements and our monitoring of Progeny's commercial deployment.

6. *Framework for M-LMS Operations in the 902-928 MHz band.* In the 1995 *LMS Report and Order*, the Commission established M-LMS as a new radio service to be licensed in certain portions of the 902-928 MHz spectrum band where it would operate along with other users in the band.<sup>13</sup> Specifically, this band is allocated on a primary basis to federal radiolocation systems and Industrial, Scientific, and Medical (ISM) equipment. Federal fixed and mobile services are allocated on a secondary basis to federal radiolocation systems and ISM equipment. LMS licensees – including both M-LMS and non-multilateration LMS – are allocated on a secondary basis to federal users and ISM devices. M-LMS is licensed in a total of 14 megahertz in two different portions of the 902-928 MHz band – the 904-909.75 MHz and 919.75-928 MHz portions of the band.<sup>14</sup> Amateur radio operations are allocated on a secondary

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<sup>11</sup> See Letter from Claude L. Stout, Executive Director, Telecommunications for the Deaf & Hard of Hearing, *et al.*, to Julius Genachowski, Chairman, Federal Communications Commission, WT Docket No. 11-49 (Apr. 12, 2013). The coalition consists of: Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI), Deaf and Hard of Hearing Consumer Advocacy Network (DHHCAN), National Association of the Deaf (NAD), Association of Late-Deafened Adults (ALDA), Cerebral Palsy and Deaf Organization (CPADO), American Association of the Deaf-Blind (AADB), California Coalition of Agencies Serving Deaf and Hard of Hearing (CCASDHH), and Technology Access Program at Gallaudet University (TAP).

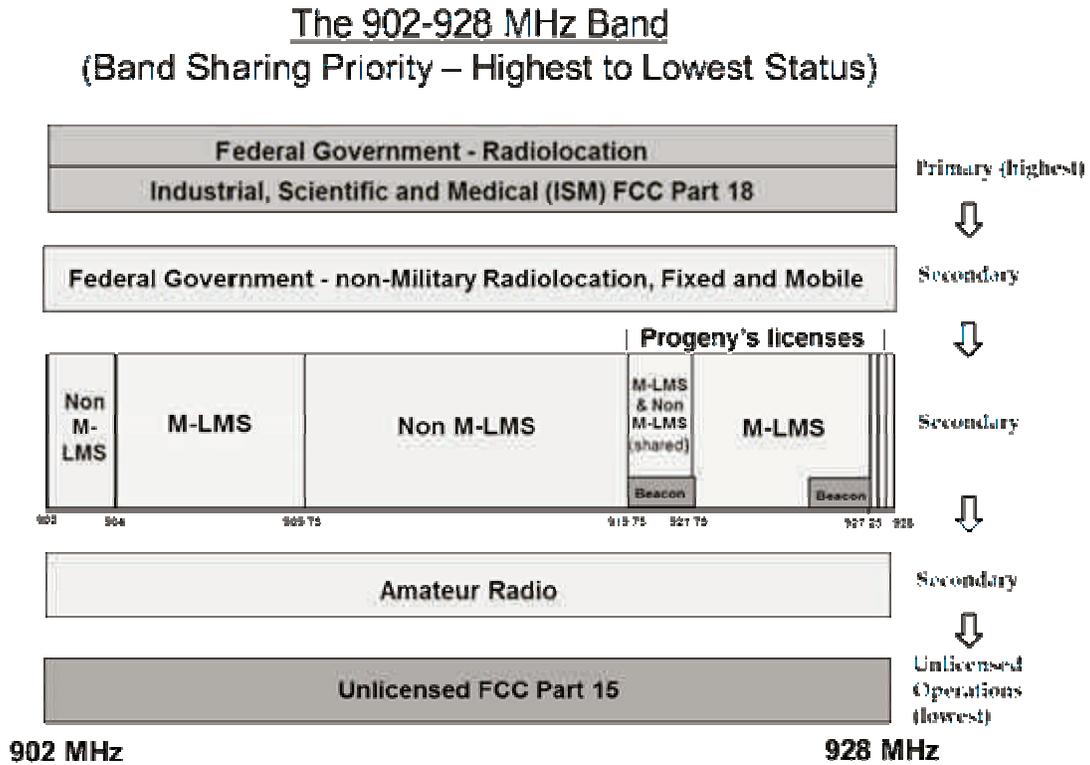
<sup>12</sup> See Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, WT Docket No. 11-49, *Order* (DA 11-2036), 26 FCC Rcd 16878, 16889 ¶ 29 (WTB/OET, rel. Dec. 20, 2011) (*Limited Waiver Order*).

<sup>13</sup> See generally Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicular Monitoring Systems, *Report and Order*, 10 FCC Rcd 4695 (1995) (*LMS Report and Order*). The Commission authorized M-LMS in a total of 14 megahertz of spectrum in the band. *Id.*

<sup>14</sup> M-LMS and non-multilateration LMS both are authorized to use the 919.75-921.75 MHz portion of the band on a co-equal basis. See *LMS Report and Order*, 10 FCC Rcd at 4722-4723 ¶¶ 48-49.

basis to LMS. Finally, unlicensed devices are permitted to operate under Part 15 rules in the 902-928 MHz band.<sup>15</sup>

7. The diagram below illustrates the hierarchy of rights associated with the different users in the 902-928 MHz band. As discussed more fully below, Progeny’s location service network is designed to operate on approximately half (~ four megahertz) of the M-LMS portions of the band between 919.750-927.750 MHz where Progeny holds licenses, periodically transmitting two beacon signals (in the areas indicated in the diagram).<sup>16</sup>



8. Unlicensed Part 15 operations were already permitted in the 902-928 MHz band by 1995, at the time that LMS rules were adopted. Specifically, in 1985, the Commission adopted rules to permit the operation of unlicensed spread spectrum systems, and, in 1989, it added rules to permit unlicensed non-spread spectrum operations in the band.<sup>17</sup> Together, these rules permitted a wide variety of unlicensed devices to be introduced in the 902-928 MHz band. Unlicensed devices operating under Part

<sup>15</sup> See *LMS Report and Order*, 10 FCC Rcd at 4699 ¶ 7. Users of Part 15 devices do not have any allocation status in the Commission’s rules.

<sup>16</sup> See para. 17 & n.45; Progeny Request, Attachment 1 (Wide Area Positioning System Network Description).

<sup>17</sup> See *Authorization of Spread Spectrum and Other Wideband Emissions Not Presently Provided for in the FCC Rules and Regulations*, Gen Docket No. 81-413, 101 FCC 2d 419 (1985); *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, GEN. Docket No. 87-389, *First Report and Order*, 4 FCC Rcd 3493 (1989).

15 of the rules may not cause harmful interference to authorized radio services,<sup>18</sup> and any received interference must be accepted by the operator of a Part 15 device, including interference received from authorized radio services, other Part 15 devices, and ISM equipment.<sup>19</sup> In addition, parties operating Part 15 devices have no vested or recognizable right to continued use of any given frequency by virtue of prior registration or certification of equipment.<sup>20</sup>

9. In authorizing M-LMS use of the band in the 1995 *LMS Report and Order*, the Commission recognized the potential for M-LMS interference with the various unlicensed operations in the band and sought to balance the differing operational needs of both to enable them to operate in the band.<sup>21</sup> In particular, the Commission adopted certain provisions designed to promote the coexistence of M-LMS and unlicensed operations in the band. In the proceeding, Part 15 commenters were concerned that M-LMS operations and Part 15 devices could not co-exist in the band because of interference from higher powered M-LMS systems, while M-LMS commenters expressed concern about potential harmful interference from Part 15 devices.<sup>22</sup>

10. In establishing the framework for promoting co-existence in the band, the Commission rejected proposals to elevate Part 15 devices to co-equal status with M-LMS. Instead, the Commission sought to “balance the equities and value of each use without undermining the established relationship between unlicensed operations and licensed services.”<sup>23</sup> In this regard, the Commission affirmed that unlicensed devices would continue to operate under Part 15 of the Commission’s rules in this band, and that persons operating unlicensed devices must accept interference from all other operations in the band, including M-LMS, and have no vested or cognizable right to continued use of any given frequency.<sup>24</sup> To accommodate the concerns of unlicensed device operators within the framework of their Part 15 status, the Commission adopted a “safe harbor” rule for unlicensed devices that permits Part 15 operations that conform to specified technical standards to be deemed as not causing harmful interference to M-LMS systems.<sup>25</sup> The Commission also established the field testing requirement as an additional means of promoting coexistence of M-LMS and unlicensed operations in the band. Specifically, to ensure that this coexistence is “as successful as possible,” the Commission conditioned M-LMS licenses on the licensee’s ability to “demonstrate through actual field tests” that their systems do not cause “unacceptable levels of interference” to Part 15 devices.<sup>26</sup> The Commission noted that M-LMS licensees could employ a number

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<sup>18</sup> See 47 C.F.R. § 15.5(b). Harmful interference is defined as “Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service.” See 47 C.F.R. § 2.1.

<sup>19</sup> See 47 C.F.R. § 15.5(b). ISM equipment uses radiofrequency energy to perform work rather than communications. See 47 C.F.R. § 18.107(c).

<sup>20</sup> See 47 C.F.R. § 15.5(a).

<sup>21</sup> The Commission stated that its decision to permit licensed LMS in the 902-928 MHz band “balances the differing operational needs” of the varied types of uses in the band “so that most [LMS] systems and Part 15 devices will be able to achieve their objectives without impeding each other’s use of the spectrum.” *LMS Report and Order*, 10 FCC Rcd at 4695 ¶ 1.

<sup>22</sup> See *LMS Report and Order*, 10 FCC Rcd at 4712-14 ¶¶ 32-34.

<sup>23</sup> *Id.*, 10 FCC Rcd at 4714 ¶ 35.

<sup>24</sup> *Id.*, 10 FCC Rcd at 4708 ¶ 23 (citing 47 C.F.R. §§ 15.5 (a)-(b)).

<sup>25</sup> *Id.*, 10 FCC Rcd at 4715 ¶ 36. See 47 C.F.R. § 90.361.

<sup>26</sup> *LMS Report and Order*, 10 FCC Rcd at 4737 ¶ 82. This requirement is codified in section 90.353(d) of the Commission’s rules. 47 C.F.R. § 90.353(d).

of technical refinements (such as limited duty cycle, pulse durations, etc.) to facilitate band sharing and minimize interference to Part 15 operations.<sup>27</sup> The Commission also indicated its expectation that testing be accomplished through cooperation between M-LMS users and operators of Part 15 systems.<sup>28</sup>

11. The Commission reaffirmed its decision to provide for licensed M-LMS service in the band, and clarified the purpose of the field testing requirements, in two reconsideration orders. In the 1996 *LMS Order on Reconsideration*, the Commission denied requests by Part 15 petitioners that the Commission establish specific or uniform guidelines for the field testing, concluding that no one testing method would adequately address the needs of either M-LMS, which permits different M-LMS system designs, or Part 15, where the industry has an “even greater array of technologies that fluctuate in response to the needs of the public.”<sup>29</sup> The Commission again stated that through the field testing it sought to facilitate band sharing and minimize interference to Part 15 operations, and that as part of that effort it sought to ensure that LMS systems are not operated in such a manner as to degrade, obstruct, or interrupt Part 15 devices to such an extent that Part 15 operations will be negatively affected.<sup>30</sup> At the same time, it continued to underscore that the M-LMS rules do not modify Part 15 rules by elevating the status of Part 15 users.<sup>31</sup> The Commission concluded that the testing requirement “is merely an attempt to achieve the most efficient coexistence possible among the various users in the band.”<sup>32</sup> In the 1997 *LMS MO&O*, in response to a petition by an M-LMS licensee, the Commission reiterated that Part 15 devices were not entitled to protection from interference from M-LMS systems and noted that the purpose of the testing condition is to ensure that M-LMS licensees, when designing and constructing their systems, take into consideration a goal of minimizing interference to existing deployments or systems of Part 15 devices, and to verify this through cooperative testing.<sup>33</sup>

12. In 1997, shortly after adopting rules to permit M-LMS operations in the 902-928 MHz band, the Commission took additional steps to facilitate co-existence between Part 15 devices and M-LMS operations in the 902-928 MHz band. Specifically, it reduced the minimum number of hopping channels required for spread spectrum devices operating in the 902-928 MHz band to make it easier for spread spectrum operators to avoid the bands used by the M-LMS.<sup>34</sup> The Commission stated that “it is to the benefit of the spread spectrum operators to avoid using the wideband multilateration LMS channels in order to reduce the potential for received interference.”<sup>35</sup> The Commission also allowed the use of

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<sup>27</sup> *LMS Report and Order*, 10 FCC Rcd at 4737 ¶ 82.

<sup>28</sup> *Id.*, 10 FCC Rcd at 4737 ¶ 82.

<sup>29</sup> Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicular Monitoring Systems, *Order on Reconsideration*, 11 FCC Rcd 16905, 16912 ¶ 16 (1996) (“*LMS Order on Reconsideration*”). The Commission suggested that M-LMS and Part 15 operators work together to develop consensus on testing guidelines. *Id.*

<sup>30</sup> *Id.* at 16911-12 ¶ 15.

<sup>31</sup> *Id.* at 16912-13 ¶ 17.

<sup>32</sup> *Id.*

<sup>33</sup> Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicular Monitoring Systems, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 12 FCC Rcd 13942, 13968 ¶ 69 (*LMS MO&O*) (1997).

<sup>34</sup> See Amendment of Parts 2 and 15 of the Commission’s Rules Regarding Spread Spectrum Transmitters, ET Docket No. 96-8, *Report and Order*, 12 FCC Rcd 7488, 7503-7504 ¶¶ 27-28 (1997) (*Spread Spectrum Report and Order*).

<sup>35</sup> *Id.*, 12 FCC Rcd at 7504 ¶ 27.

technology that enables a spread spectrum device to detect occupied channels within its band of operation and then adapt its hopping channel sequence to avoid these channels.<sup>36</sup>

13. *Limited Waiver Order*. Over the past few years, Progeny has been developing a multilateration location service that employs beacon signals from fixed base stations. Progeny's proposed location service is consistent with the location service for which it first obtained licenses in 1999 through an auction<sup>37</sup> and would operate at the same power levels and operational characteristics authorized under the Commission's rules in 1995. In March 2011, Progeny filed a petition seeking a limited waiver of two existing M-LMS service rules to enable it to deploy this beacon system, which employs advanced technologies not available in the mid-1990s and is designed to operate in a manner that would reduce the number of transmissions on Progeny's licensed spectrum.<sup>38</sup> In December 2011, WTB and OET granted a limited waiver to permit Progeny to continue developing its proposed location service, based, in part, on the public interest benefits of facilitating the deployment of a multilateration location service that can provide more accurate location determinations, including more precise location information that can improve delivery of E 911 emergency services.<sup>39</sup> This limited waiver did not create or establish a new service. Rather, within the flexible framework of the existing location and monitoring service, the waiver effectively lowered the potential for interference from Progeny's operations in the band. In addition, the order granting the waiver established a transparent process for ensuring that Progeny meets the Commission's field testing requirement prior to commencing commercial operations.

14. Specifically, the limited waiver relieved Progeny of the requirement to employ two-way transmission paths, a change that effectively reduces the potential for interference by eliminating transmissions from portable devices that receive the location information. While the 1995 M-LMS rules envisioned two-way operations that could use all of the M-LMS licensees spectrum bandwidth, under the limited waiver, Progeny would instead be utilizing substantially less of its licensed spectrum and would be doing so for one-way operations. The limited waiver also relieved Progeny of the requirement that it provide service primarily to vehicles and allowed it to provide service to any device anywhere, a change that would have no appreciable effect on the number or deployment of Progeny's transmitters, and which is central to Progeny's ability to offer its location service via mobile devices to compute more precisely a user's indoor or outdoor location for E 911 and other purposes.<sup>40</sup>

15. The *Limited Waiver Order* did not waive the interference rules that the Commission established in 1995 governing M-LMS operations in the 902-928 MHz band.<sup>41</sup> In particular, the order made clear that Progeny remained obligated to satisfy the field testing requirement, set forth in section 90.353(d) of the Commission's rules, to demonstrate through actual field tests that its M-LMS system will not cause unacceptable levels of interference to Part 15 devices in the band. As a condition of the order, Progeny was required, once it had completed design of its system but prior to commencing commercial

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<sup>36</sup> *Id.*, 12 FCC Rcd at 7514 ¶ 51.

<sup>37</sup> See "Location and Monitoring Service Auction Closes, Winning Bidders in the Auction of 528 Multilateration Licenses in the Location and Monitoring Service," *Public Notice*, 14 FCC Rcd 3754 (1999); "VHF Public Coast and Location and Monitoring Service Spectrum Auction Closes, Winning Bidders Announced," *Public Notice*, 16 FCC Rcd 12509 (2001). Progeny obtained most of its licenses in the 1999 auction.

<sup>38</sup> See Petition for Waiver of the Rules and Request for Expedited Treatment, Progeny LMS, LLC (Mar. 8, 2011).

<sup>39</sup> See generally *Limited Waiver Order*, 26 FCC Rcd 16876.

<sup>40</sup> See *id.*, 26 FCC Rcd at 16884-16887 ¶¶ 14-23.

<sup>41</sup> See *id.*, 26 FCC Rcd at 16887-16889 ¶¶ 24-29.

operations, to file a report describing its system and the field testing it conducted. The order also stated that the report would be placed on public notice for comment.<sup>42</sup>

16. *Existing Deployments and Field Testing.* Progeny has deployed and operated its M-LMS network in the San Jose, California, area for the past three years, and has commenced initial deployment and operation of networks in 39 other Economic Areas across the country over the past several months.<sup>43</sup> To date, we have not received interference complaints that suggest that Progeny's system is causing any significant impact upon Part 15 operations in the 902-928 MHz band. While interference is often difficult to identify or trace to a particular source, the many devices using this spectrum have been designed to adapt to received interference, since they have no interference protection rights and are all capable of interfering with each other.<sup>44</sup>

17. Progeny has submitted four sets of field tests to the Commission. All of the tests were conducted around San Jose. Progeny described its specific network design (*e.g.*, transmitting two beacons using approximately four megahertz of its eight megahertz of licensed spectrum) and submitted the first set of field testing in January 2012, which was conducted by an outside consultant.<sup>45</sup> We invited comment on these tests in February 2012,<sup>46</sup> and received several comments.<sup>47</sup> Based on concerns raised by two manufacturers of automatic meter readers (AMRs) and by the Wireless Internet Service Providers Association (WISPA), Commission staff called upon Progeny and these parties to work together to conduct further tests. Progeny and these parties submitted three sets of joint tests in October 2012.<sup>48</sup> We

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<sup>42</sup> *Id.*, 26 FCC Rcd at 16889 ¶ 29.

<sup>43</sup> See Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, *Ex Parte*, WT Docket No. 11-49 (Mar. 21, 2013), Slide at 13; Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, *Ex Parte*, WT Docket No. 11-49 (Feb. 19, 2013) at 2 (indicating that Progeny had constructed its initial M-LMS networks in a total of 19 Economic Areas to meet the Commission's initial buildout requirements, and that these network were operational by July 2012; initial networks in 20 more Economic Areas were constructed and operational by November 2012). Progeny's M-LMS licenses are licensed by Economic Areas. 47 C.F.R. § 90.353(d). Progeny has completed initial launch of another Economic Area in recent weeks.

<sup>44</sup> See 47 C.F.R. § 15.5(b).

<sup>45</sup> See Progeny Request, Attachment 1 (Wide Area Positioning System Network Description) & Attachment 2 (Progeny/SMC Field Testing Report). The system operates in the upper portions of the 902-928 MHz band, where Progeny holds both the B and C blocks of M-LMS spectrum. Progeny's network transmits using two beacons, each of which operates across 2.046 megahertz of spectrum, with a duty cycle of no more than 20%. See *id.*, Attachment 1 at 4-5. The B and C block spectrum encompasses 919.750-921.750 MHz and 927.500-927.750 MHz (B block) and 921.750-927.250 MHz and 927.250-927.500 MHz (C block).

<sup>46</sup> The Wireless Telecommunications Bureau and the Office of Engineering and Technology Seek Comment on Progeny's M-LMS Field Testing Report, WT Docket No. 11-49, *Public Notice*, DA 12-209, 27 FCC Rcd 1579 (WTB/OET rel. Feb. 14, 2012).

<sup>47</sup> See, *e.g.*, Comments of Itron, Inc. on Progeny's Test Report (Mar. 15, 2012) (manufactures automatic meter reader equipment); Comments of Cellnet Technology, Inc., a Landis+Gyr Company (Mar. 15, 2012) (same); Comments of the Wireless Internet Service Providers Association (Mar. 15, 2012); Comments of Kapsh TrafficCom IVHS Inc. (Mar. 15, 2012).

<sup>48</sup> See Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, and Laura Stefani, Counsel for Itron, to Marlene H. Dortch, Secretary, Federal Communications Commission, Progeny/Itron Joint Field Testing Report (Oct. 31, 2012); Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, and Lawrence J. Movshin, Counsel for Landis+Gyr, to Marlene H. Dortch, Secretary, Federal Communications Commission, Progeny/Landis+Gyr Joint Field Testing Report (Oct 31, 2012); Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, and Stephen E. (continued....)

sought comment on these tests in November 2012.<sup>49</sup> A number of parties filed comments asserting that Progeny has not met its burden of satisfying the Commission's field testing requirement<sup>50</sup> and that the tests show that Progeny's system will cause unacceptable levels of interference to unlicensed devices, particularly to meter reading and other devices used by utilities, Wireless Internet Service Providers (WISPs), and various electronic products.<sup>51</sup> Various of these commenters contend that the field testing conducted is not representative of Part 15 devices operating in the 902-928 MHz band,<sup>52</sup> that more devices or particular devices should be tested,<sup>53</sup> that Progeny's system (higher power levels, duty cycle, and beacon density) would effectively reduce the amount of spectrum available for Part 15 operations in the 902-928 MHz band, require redesign of unlicensed devices or systems, and increase the potential for interference among Part 15 users,<sup>54</sup> and that Progeny's network in San Jose may not be representative of the Progeny's deployment and its potential impact on Part 15 operations elsewhere.<sup>55</sup> The comment period closed in January 2013.

18. In evaluating Progeny's request, we implement the section 90.353(d) standard regarding "unacceptable levels" of interference that the Commission established when providing for M-LMS operations in the 902-928 MHz band. A number of parties assert that the Commission should open a new

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Coran, Counsel for WISPA, to Marlene H. Dortch, Secretary, Federal Communications Commission, Progeny/WISPA Joint Field Testing Report (Oct. 31, 2012).

<sup>49</sup> The Wireless Telecommunications Bureau and the Office of Engineering and Technology Seek Comment on Progeny's Joint M-LMS Field Testing Reports, WT Docket No. 11-49, *Public Notice*, DA 12-1873, 27 FCC Rcd 14461 (WTB/OET, rel. Nov. 20, 2012); Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, WT Docket No. 11-49, DA 12-1930, *Order*, 27 FCC Rcd 14968 (WTB/OET, rel. Nov. 30, 2012) (extending comment period).

<sup>50</sup> See, e.g., Itron Comments (Dec. 21, 2012); Landis+Gyr Comments (Dec. 21, 2012). See also, e.g., Google Inc. *Ex Parte* (Apr. 18, 2013).

<sup>51</sup> See e.g., Itron Comments (Dec. 21, 2012) (AMRs); Landis+Gyr Comments (Dec. 21, 2012) (AMRs); Utilities Telecom Council (UTC) Comments (Dec. 21, 2012) (utility grid operations); Wireless Internet Service Providers Association Comments (Dec. 21, 2012) (WISPs); LakeNet, LLC Comments (Dec. 21, 2012) (WISP); GE Digital Energy and GE MDS, LLC Comments (Dec. 21, 2012) (equipment for electric utilities, oil and gas companies, and others); American Petroleum Institute Comments (Dec. 12, 2012) (Supervisory Control and Data Acquisition (SCADA) systems, RFID, and various digitally modulated spread spectrum systems); Starkey Laboratories, Inc. (Dec. 21, 2012) (hearing aid accessories); Alarm Industry Communications Committee Reply Comments (Jan. 11, 2013) (alarm systems); Inovonics Wireless Corporation Comments (Dec. 21, 2012) (alarm systems); Plantronics, Inc. Comments (Dec. 21, 2012) (wireless headsets). See also, e.g., Part 15 Coalition *Ex Parte* (Apr. 15, 2013). We also received comments from representatives of non-multilateration LMS operations that operate in portions of the 902-928 MHz band. See, e.g., Kapsch TrafficCom IVHS Inc. Comments (Dec. 21, 2012); E-Z Pass Group Comments (Dec. 26, 2012). The field testing requirement discussed herein does not apply to these licensed services, and the non-multilateration LMS and M-LMS licensees are subject to specified cooperation requirements under the Commission's rules. See 47 C.F.R. § 90.173(b).

<sup>52</sup> See, e.g., Part 15 Coalition Comments (Dec. 21, 2012); UTC Comments (Dec. 21, 2012); GE Digital Energy and GE MDS, LLC Comments (Dec. 21, 2012).

<sup>53</sup> See, e.g., Plantronics Comments (Dec. 21, 2012); Plantronics *Ex Parte* (Apr. 17, 2013); Part 15 Coalition Comments (Dec. 21, 2012). See also, e.g., Inovonics Wireless Corporation *Ex Parte* (Apr. 17, 2013).

<sup>54</sup> See, e.g., Part 15 Coalition Comments (Dec. 21, 2012); RFK Engineering Solutions, LLC Comments (Dec. 21, 2012); UTC Reply Comments (Jan. 11, 2013).

<sup>55</sup> See, e.g., Itron Comments (Dec. 21, 2012); UTC Reply Comments (Jan. 11, 2013).

rulemaking to specifically define “unacceptable levels of interference,”<sup>56</sup> yet this same argument was made and rejected by the full Commission in 1996.<sup>57</sup> As the Commission noted, for purposes of determining “unacceptable levels of interference,” no uniform field testing method is appropriate considering the great array of devices that the Part 15 industry deploys in the 902-928 MHz, which are designed to address different needs and thus have no common design. Nor has the Commission ever determined technical criteria for evaluating interference to unlicensed devices, which operate on a non-protected basis.

19. In assessing “unacceptable levels of interference” for the field test requirement, we seek consistency with the Commission’s clear and repeated pronouncements that unlicensed devices in the 902-928 MHz band operate under the Part 15 rules that offer no protection from harmful interference. The Commission’s intent with regard to field testing was not to create and apply a specific minimum standard of interference protection to all unlicensed devices operating in the 902-928 MHz band, but instead to ensure more broadly that the various types of unlicensed devices permitted under the Commission’s Part 15 rules would continue to be able to operate in the band when potential interference from M-LMS was introduced. The Commission expressly recognized that M-LMS potentially would cause interference to some of the various types of unlicensed operations in the band, and it modified the Part 15 rules to enable certain spread spectrum devices to avoid using M-LMS channels.<sup>58</sup> The field test requirement does not create an obligation that M-LMS licensees protect particular unlicensed devices or models from interference, and it does not require an M-LMS licensee to avoid causing interference to particular unlicensed systems or to particular circumstances of their operation.<sup>59</sup> To require this would elevate the status of Part 15 operations in the band and undermine the established relationship between licensed and unlicensed operations.<sup>60</sup> Such an approach would effectively enable individual unlicensed operators to block the introduction of M-LMS on the basis of interference to their particular devices or models, or their particular systems or circumstances of operation, giving them greater rights against a licensed service than they have against other Part 15 operations in the band – a result that is fundamentally inconsistent with the Commission’s decision on the operating status of unlicensed devices in the band. We conclude that the purpose of the field test is to promote the coexistence of M-LMS and unlicensed operations in the band by “minimizing” – not eliminating – the potential for M-LMS interference to Part 15 operations overall so that the band can continue to be used for unlicensed operations without significant detrimental impact, consistent with their Part 15 status. This conclusion strikes a sensible policy balance and rests on a reasonable interpretation of the Commission’s rules and prior orders. Moreover, we find no evidence that the testing requirement was intended to re-open the issue of whether M-LMS should be authorized to operate in this spectrum.

20. Under this framework, we evaluate whether Progeny has satisfied the field test requirement so that it may commence commercial operations. In particular, an M-LMS licensee must be able to demonstrate that, in designing and constructing its particular M-LMS system, it has appropriately

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<sup>56</sup> See, e.g., *Public Knowledge Ex Parte* (Mar. 11, 2013); *GE Digital Energy Ex Parte* (Mar. 13, 2013).

<sup>57</sup> See discussion above, para. 11; *LMS Order on Reconsideration*, 11 FCC Rcd at 16912 ¶ 16.

<sup>58</sup> See discussion above, paras. 9-12.

<sup>59</sup> For example, a particular model of unlicensed device might not be able to avoid received interference due to its design or the specific circumstances of its operation, but that would not preclude operation of the M-LMS system. A number of design and operational factors may affect whether interference occurs to a given device at a given location. These include a device’s frequency range of operation (including any ability to change frequencies), modulation type, separation distance from other devices, receive antenna height and directivity, and any intervening obstacles such as walls or terrain.

<sup>60</sup> See discussion above, paras. 10-11.

taken into consideration this goal of minimizing interference to existing deployments or systems of Part 15 devices.<sup>61</sup> In reviewing Progeny's submissions, we examine whether Progeny's M-LMS system has been designed in a manner that reasonably minimizes the potential for interference to Part 15 operations.<sup>62</sup> Because we conclude that the field test requirement does not require an M-LMS licensee to demonstrate that its system would protect each individual unlicensed operation from interference, not every unlicensed device operating in the 902-928 MHz band needs to be evaluated; it is sufficient that a representative cross-section of the various types of devices that may be authorized for operation under the Part 15 rules for this band are evaluated. We also consider whether the particular types of unlicensed devices authorized under the Part 15 rules are able to make adjustments or take other steps to minimize or avoid receiving interference from the M-LMS system, as is incumbent with their unlicensed status. For the various users of unlicensed Part 15 devices in the 902-928 MHz band, the potential for interference is ever present, and has been since they have operated in the band. Such users have long been aware that not only are they not entitled to interference protection from other users in this heavily used band, including licensed users, but also that they can and do experience interference from other unlicensed users under the Part 15 rules,<sup>63</sup> and that, given their unlicensed status, they may need to find ways to make necessary adjustments to their systems. Accordingly, equipment manufacturers and users of unlicensed devices have shown much creativity and resourcefulness in designing new technologies and products that can operate successfully in this and other bands.

21. We find that Progeny's M-LMS system design and the different sets of field testing submitted – which cover a wide variety of Part 15 devices in different proximities and configurations vis-à-vis Progeny's actual beacon transmissions on a fully deployed network – provide significant and sufficient data for us to evaluate the potential for interference. We recognize that the potential exists for interference to certain devices or systems, but also are cognizant that the potential for interference to these devices already exists because a variety of different users operate in this spectrum. Based on the evidence before us, we find that the potential for increased interference within the 902-928 MHz band that could result from commercial operation of Progeny's M-LMS system will not create a significant detrimental effect overall on unlicensed operations in the band, and that the band therefore can continue to be used for such unlicensed operations consistent with their Part 15 status. We therefore conclude that Progeny has satisfied the field test requirement so that it may commence commercial operations. The four sets of field tests that Progeny submitted collectively included more than 20 devices that encompass a representative variety of Part 15 devices operating in the 902-928 MHz band – including AMR equipment, fixed wireless broadband, RFID, wireless phones, emergency pendants, wireless speakers, and baby monitors.<sup>64</sup> The tested devices include each of the three categories of Part 15 device technologies authorized by the Commission's rules – frequency hopping spread spectrum devices under Section 15.247(a)(1) (8 devices);

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<sup>61</sup> See discussion above, para. 11; *LMS MO&O*, 12 FCC Rcd at 13968 ¶ 69.

<sup>62</sup> That the field test requirement focuses on the M-LMS licensee's system design also is implicit in the standard, which concerns whether the licensee's system does not cause "unacceptable *levels* of interference" (emphasis added), not whether its system might, in some particular situation, cause "unacceptable interference" to particular Part 15 devices.

<sup>63</sup> For instance, manufacturers of unlicensed automatic meter reading (AMR) devices, which use spread spectrum technologies, have complained about potential for interference from unlicensed wireless internet service providers (WISPs) that deploy digitally modulated systems in the band. See Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 11383, 11387-88 ¶¶ 13-15 (2007) (the two AMR manufacturers that complained were Landis+Gyr's predecessor Cellnet and Itron).

<sup>64</sup> See generally Progeny/SMC Field Testing Report; Progeny/Itron Joint Field Testing Report; Progeny/Landis+Gyr Joint Field Testing Report; Progeny/WISPA Joint Field Testing Report.

digitally modulated spread spectrum devices under Section 15.247(a)(2) (6 devices), and devices that comply with Section 15.249 (8 devices) – and provide an appropriately representative cross-section of Part 15 devices and systems that operate in the 902-928 MHz band.

22. Some commenters have requested that Progeny conduct additional field tests on their specific unlicensed devices or specific types of unlicensed device applications.<sup>65</sup> We believe that such additional testing is unnecessary because the tested devices are representative of the technologies typically employed for operation under Part 15 of the rules. None of the commenters have shown that the additional devices for which they request testing are significantly different in technology from the previously tested devices, so testing these additional devices is unlikely to provide additional information pertinent to determining the potential of the Progeny system to cause unacceptable levels of interference. We also do not see the benefit of isolated field tests on numerous individual devices since thousands of unlicensed devices have been approved for operation in the 902-928 MHz band over the years,<sup>66</sup> and operational factors may affect whether interference occurs to a given device at different locations.<sup>67</sup> Testing more than a representative sample of unlicensed devices based on requests for testing of individual, but often similar devices could result in endless rounds of field tests and endless delays of commercial M-LMS deployment. Such testing would also effectively elevate unlicensed users to a form of interference protection that well exceeds their Part 15 status.

23. In evaluating whether Progeny's network satisfies the field testing requirement, we first examine Progeny's M-LMS system design. Progeny is deploying a one-way beacon system that uses approximately half of its licensed spectrum (~four megahertz of its eight megahertz), which reduces the amount of spectrum its system uses and eliminates potential interference to Part 15 devices from the M-LMS mobile transmissions that could have resulted from the two-way transmissions originally authorized under the rules.<sup>68</sup> Each beacon in the Progeny network will not be transmitting continuously, thus providing opportunities for other spectrum users to access the spectrum.<sup>69</sup> Further, Progeny plans to deploy a high site, low density network that would minimize the number of transmitters used in its network and potentially lower interference to many Part 15 devices. Accordingly, we find that Progeny's system design is consistent with core purposes of the field testing, which is to ensure that the M-LMS licensee has minimized, not eliminated, the potential for M-LMS interference to Part 15 operations overall so that the band will continue to be used for unlicensed operations consistent with their Part 15 status.<sup>70</sup>

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<sup>65</sup> See, e.g., Letter from Gordon Foyster and Chris Andrews, Taggle Systems, WT Docket No. 11-49 (April 15, 2013); Letter from Laura Stefani, Counsel for Inovonics Wireless Corp., WT Docket No. 11-49 (April 16, 2013); Letter from David Malkin, GE Digital Energy, WT Docket No. 11-49 (April 26, 2013); Letters from Paul Sinderbrand, Counsel for Plantronics, Inc., WT Docket No. 11-49 (April 17, 2013; May 6, 2013).

<sup>66</sup> Over the last five years (since May 2008), the Commission has approved approximately 2200 unlicensed devices for operation in the 902-928 MHz band. Of these, approximately half are spread spectrum devices and half are lower power devices. Over the last thirty years (since May 1993), the Commission has approved approximately 6200 unlicensed devices for operation in the 902-928 MHz band. However, the Commission does not collect information on which approved devices (or the number of units of an approved device) actually enter the market or continue to be operated.

<sup>67</sup> See *supra* note 59.

<sup>68</sup> *Limited Waiver Order*, 26 FCC Rcd at 16884-16885 ¶¶ 14-19.

<sup>69</sup> See Progeny Request, Attachment 1 at 1; see also note 45, above.

<sup>70</sup> See discussion above, para. 11; *LMS MO&O*, 12 FCC Rcd at 13968 ¶ 69.

24. The tests show that most unlicensed devices will continue to work as intended, even in cases where Progeny's system can interfere to some degree. Many unlicensed devices are already designed to adapt to interference by, for example, locating unoccupied bandwidth (either automatically or by re-tuning), reducing the distance between their transmitters and receivers, or adding additional transmitter links. Further, Progeny's system operates on only 4 (out of 26) megahertz in the band.

25. The tests on frequency hopping spread spectrum devices (such as those used by AMR systems, Supervisory Control and Data Acquisition (SCADA) systems, and various alarm systems), show that in some instances there can be some reduction in the percentage of data packets successfully transmitted at a particular instant in time, but that the data packets get through over time because these devices are designed to operate on multiple channels and re-transmit as needed. That is, these devices generally can adapt to the interference environment to function as intended by sending the data packets over available frequencies. As discussed above, the Commission amended the rules for frequency hopping spread spectrum devices in 1997 to make it easier for manufacturers to develop devices that can avoid operating in the portions of the 902-928 MHz band used by the M-LMS.<sup>71</sup>

26. As for digitally modulated devices, the tests also show that these devices continued to function. For digitally modulated systems used by WISPs in particular, the tests show varying results but also continued functionality; for these systems, the worst-case scenarios occurred when WISP antennas were in close proximity to Progeny's beacons. WISP operations in rural and less dense areas are highly unlikely to be affected because Progeny is focusing its deployment in urban areas. WISP deployments in urban areas may or may not be affected depending on the specific circumstances of the WISP communication link(s) and physical relationship to Progeny's transmitters, and altering these specific circumstances and relationship to Progeny's transmitters in order to address possible interference problems should be manageable in most instances. The tested wireless broadband systems, for example, had features that an operator can use to avoid received interference; specifically, both had the capability to select the operating frequency, and one had the capability to operate with different channel bandwidths.

27. The tests also show that devices authorized under Section 15.249 of the rules, such as cordless telephones, baby monitors and wireless headphones and speakers, would continue to function in most cases. In some instances audio noise could be heard in devices operating on the same frequency as the Progeny system at locations near a beacon. However, the noise could generally be eliminated by changing a device's channel if it had a tuning capability, or by moving the device's transmitter and receiver closer together to provide a stronger desired signal at the receiver.

28. In sum, many Part 15 devices will adapt to Progeny's operations because they are designed for operation in an interference environment. We recognize that in certain instances some adjustments to a Part 15 system may be required. Such adjustments are commonly required today in situations where new unlicensed devices begin operation in a frequency band with existing Part 15 systems. We also recognize that in certain instances a particular Part 15 device may not be able to operate in close proximity to a Progeny beacon and may lack the capability to tune to another frequency band because its manufacturer chose not to incorporate that capability. Such devices may therefore require replacement with a device that operates on a different frequency. However, the results showed that the three tested categories of Part 15 devices (frequency hopping spread spectrum devices under Section 15.247(a)(1); digitally modulated spread spectrum devices under Section 15.247(a)(2), and devices that comply with Section 15.249) will generally coexist with the Progeny system and that Progeny has acted reasonably to minimize interference. To reiterate, because the rules do not require Progeny to demonstrate that it has eliminated such interference, the continuing existence of some interference to

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<sup>71</sup> See discussion above, para. 12.

some Part 15 devices in some circumstances does not preclude our determination that Progeny has satisfied the Section 90.353(d) field test requirement.

29. *Reporting and Monitoring Ongoing Deployment.* Based on the field testing before us, we permit Progeny to commence commercial operations. At the same, given the heavy use of the 902-928 MHz band by Part 15 unlicensed operations, particularly those that provide important services to the nation's communications infrastructure, we believe it is important to monitor ongoing developments as Progeny continues to deploy its network and commence commercial operations.<sup>72</sup> We are imposing certain conditions on Progeny that will help us to monitor these developments while also promoting the co-existence of its M-LMS operations in the 902-928 MHz band. As we monitor commercial deployment, we recognize again that Part 15 users are permitted to operate in the band pursuant to the status associated with unlicensed use under our Part 15 rules, and that, as discussed above, particular unlicensed devices or systems are not entitled to interference protection from Progeny's operations.<sup>73</sup>

30. Progeny has offered certain assurances regarding steps it would take to address interference concerns that might arise as it deploys its commercial M-LMS network.<sup>74</sup> Specifically, Progeny states that it will provide to the Commission reports every six months on the status of its buildout in each Economic Area license area, as well as on any complaints of unacceptable levels of interference to Part 15 devices and the steps that Progeny is taking (or has taken) to address these complaints.<sup>75</sup> Progeny also states that it will create a website and toll-free help desk to enable Part 15 device users to notify Progeny and seek assistance in investigating and mitigating potential interference issues. We agree that certain reporting requirements are appropriate, and that such a website would be helpful for both Progeny and unlicensed users. In permitting Progeny to commence commercial operations, we require Progeny (1) to submit notification in this docket, by June 21, 2013, of the specific Economic Areas where Progeny already has completed the initial buildout of its network and is operating, and thereafter to submit such notifications for each additional Economic Area within 15 days after it begins operating,<sup>76</sup> (2) to establish a website and help desk (as described, above), and (3) to submit to us three reports over the next 18 months – by December 6, 2013, June 6, 2014, and December 6, 2014 – regarding any interference complaints that it may receive.

31. Progeny also has stated that it will address potential concerns regarding unacceptable levels interference to Part 15 users at particular locations by working cooperatively with affected parties to mitigate the interference including potentially relocating M-LMS beacons (either horizontally, vertically, or to an entirely different location), substituting or modifying beacon antennas, or modifying antenna patterns, antenna heights, transmitter slot assignments, duty cycles, or a combination of these actions.<sup>77</sup> Progeny also states that if it constructs beacons in rural areas, it will work directly with any WISP network operators utilizing the 902-928 MHz band to ensure that any interference is minimized and

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<sup>72</sup> We will monitor subsequent Progeny deployments to address the concern raised by commenters about the representative nature of Progeny's network in San Jose, as well as concerns that may arise as Progeny deploys its network in additional areas of the country. See para. 16 & n.43, above.

<sup>73</sup> See discussion in paras. 19-20 above.

<sup>74</sup> Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 11-49 (May 6, 2013) (Progeny May 6, 2013 *Ex Parte*).

<sup>75</sup> *Id.* at 2.

<sup>76</sup> We define this initial buildout as the buildout necessary to meet the Commission's initial construction benchmark for the licenses. See C.F.R. § 90.155(d) (construct and place in operation a sufficient number of base stations that utilize multilateration location service to one-third of the Economic Area's population).

<sup>77</sup> Progeny May 6, 2013 *Ex Parte* at 2.

does not preclude the continued provision of wireless broadband services to their customers.<sup>78</sup> We expect commensurate levels of cooperation from unlicensed Part 15 users. Specifically, we strongly urge Progeny and Part 15 users of this spectrum to work cooperatively to establish a process to identify and correct problems, consistent with the Commission's framework for promoting use of the 902-928 MHz band by both M-LMS and unlicensed operations. WTB and OET staff will closely monitor developments on an ongoing basis, and will assess what action, if any, would be appropriate under the circumstances for the parties to take to promote co-existence. For example, we expect Part 15 users to take reasonable steps consistent with existing practice for unlicensed operations to remedy interference, such as adjusting the operating frequency of the device or adding additional links as necessary to achieve a desired level of performance. Similarly, we expect Progeny to take reasonable steps to minimize, avoid, or remedy interference – such as adjusting the transmitter height, radiation pattern, reducing power, or altering duty cycle – at locations where a significant number of unlicensed users are affected.

32. *Conclusion.* For the reasons discussed above, we find that Progeny has met the Commission's requirements pertaining to field testing of Progeny's M-LMS, as set forth in Section 90.353(d), and we grant Progeny's request to commence commercial operations of its M-LMS network in its license areas using the beacon network design tested in the field testing, subject to the conditions specified above.

### III. ORDERING CLAUSE

33. Accordingly, IT IS ORDERED that, pursuant to Sections 2, 4(i), 302a(a), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 152, 154(i), 302a(a), 303(f), and 303(r), and Section 90.353(d) of the Commission's rules, 47 C.F.R. § 90.353(d), the request by Progeny LMS, LLC, to commence commercial operations of its M-LMS system is GRANTED to the extent discussed herein.

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<sup>78</sup> Progeny May 6, 2013 *Ex Parte* at 2. We also note that Progeny states that it will make its toll-free help desk available to non-multilateration LMS licensees, and in the event that non-multilateration LMS licensees are utilizing the 919.75-921.75 MHz band, which is allocated both to M-LMS and non-multilateration LMS on a co-primary basis, Progeny will work with the non-multilateration licensees to ensure the cooperative use of the spectrum. As we noted above, M-LMS and non-multilateration LMS licensees operating in this portion band are co-primary and already subject to specified cooperation requirements under the Commission's rules. *See* n.[51], above. Because our rules already establish cooperation requirements applicable to these licensees, which continue to apply, we do not address issues relating to them in this order. *Id.*

34. IT IS FURTHER ORDERED that Progeny LMS, LLC, submit notification in this docket, by June 21, 2013, of the specific Economic Areas where Progeny already has completed the initial buildout of its network and is operating, that Progeny submit thereafter such notifications for each additional Economic Area within 15 days after it begins operating; that Progeny establish a website and toll-free help desk to enable users of unlicensed devices in the 902-928 MHz band to notify Progeny and seek assistance in investigating and mitigating potential interference issues; and that Progeny file three reports with the Commission – by December 6, 2013, June 6, 2014, and December 6, 2014 – regarding any interference complaints that it has received.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary