

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

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

**REPLY TO OPPOSITION TO  
PETITIONS FOR RECONSIDERATION**

Plantronics, Inc. (“Plantronics”), by its attorneys and pursuant to Sections 1.106(h) and 1.429(g) of the Commission’s Rules,<sup>1</sup> hereby submits its reply to the July 19, 2013 opposition filed Progeny LMS, LLC (“Progeny”)<sup>2</sup> in response to petitions by Plantronics and five others<sup>3</sup> urging the Commission to reconsider the June 6, 2013 *Order* in this proceeding.<sup>4</sup>

Plantronics is a member of the Part 15 Coalition and endorses both the petition for reconsideration that the Part 15 Coalition submitted on July 8, 2013 and the reply that the Part 15 Coalition is submitting today. In the interest of brevity, Plantronics will refrain from repeating the arguments advanced by the Part 15 Coalition, and will focus the remainder of this reply on refuting arguments specifically targeted by Progeny at Plantronics.

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<sup>1</sup> 47 C.F.R. §§ 1.106(h), 1.429(g).

<sup>2</sup> See Opposition of Progeny LMS, LLC, WT Docket No. 11-49 (filed July 19, 2013) [“Progeny Opposition”].

<sup>3</sup> See Petition for Reconsideration of Plantronics, Inc., WT Docket No. 11-49 (filed July 8, 2013) [“Plantronics Petition”]; Petition for Reconsideration of the Part 15 Coalition, WT Docket No. 11-49 (filed July 8, 2013); Petition for Reconsideration of the Utility Trade Associations, WT Docket No. 11-49 (filed July 8, 2013); Petition for Reconsideration of the Wireless Internet Service Providers Association, WT Docket No. 11-49 (filed July 8, 2013); Petition for Reconsideration of Silver Spring Networks, Inc., WT Docket No. 11-49 (filed July 8, 2013); Petition for Reconsideration, and Petition to Deny of Skybridge Spectrum Foundation, et al., WT Docket No. 11-49 (filed July 8, 2013).

<sup>4</sup> Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, *Order*, 28 FCC Rcd 8555 (2013) [“*Order*”].

In its Petition, Plantronics establishes that in allowing M-LMS into the 902-928 MHz band after it had already become home to a vibrant Part 15 ecosystem, the Commission specifically sought to craft a regulatory environment that “continues to permit secondary operations by unlicensed Part 15 and amateurs across the entire band, *but affords users in these services a greater degree of protection to their operations;*”<sup>5</sup> that the Commission’s goal was to “provide certainty for *all users* of the band so they can invest in the equipment and facilities necessary to bring quality, low cost services to consumers;”<sup>6</sup> and that M-LMS licenses would bear the burden to “verify through cooperative testing” that they had satisfied those objectives prior to commencement of M-LMS operations.<sup>7</sup> The record on reconsideration establishes that the *Order* errs in concluding that, *vis a vis* Plantronics’ 902-928 MHz band wireless headset system, Progeny has satisfied its obligation.

**I. PROGENY DID NOT TEST ANY PART 15 DEVICE REPRESENTATIVE OF PLANTRONICS’ WIRELESS HEADSET SYSTEM.**

Progeny concedes that it never tested the Plantronics 902-928 MHz band wireless headset system. Yet, Progeny would have the Commission believe that “[t]he joint and independent tests [Progeny conducted] included devices with audio quality requirements that are arguably at least as demanding as those of Plantronics, as well as devices using similar voice encoding and modulation, channel selection, and power control technologies.”<sup>8</sup> That is simply not so.

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<sup>5</sup> Plantronics Petition at 4, *quoting* Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, *Report and Order*, 10 FCC Rcd 4695, 4701 ¶ 11 (1995) [“1995 LMS Order”].

<sup>6</sup> Plantronics Petition at 4-5, *quoting* 1995 LMS Order, 10 FCC Rcd at 4696 ¶ 2 (emphasis added).

<sup>7</sup> Plantronics Petition at 5, *quoting* Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules, *Order*, 26 FCC Rcd 16878, 16887 ¶ 25 (2011) [“2011 Waiver Order”].

<sup>8</sup> Progeny Opposition at iii.

Progeny asserts that four of the devices that it unilaterally tested are representative of the Plantronics' 902-928 MHz band wireless headset system: (1) Sennheiser wireless headphones (FCC ID DMORS03ABUS); (2) Brookstone wireless speakers (FCC ID S6LB-BROOKSTONE); (3) Motorola push-to-talk walkie-talkies (FCC ID IHDP56HJ1); and (4) Sony DSS TDD cordless telephone (FCC ID AK8SPPSS965). In fact, as the record makes clear, each of these devices is fundamentally different from Plantronics' 902-928 MHz band wireless headset system; and testing them is not a meaningful predictor of interference to Plantronics'.<sup>9</sup>

The Plantronics CS50 is a wireless headset system with a two-way radio link delivering full duplex telephone audio between a user-worn headset and a base unit. The base unit plugs into the side of a telephone, replacing the telephone's handset functionality with an external headset. The system works compatibly with the sidetone signal generated by the telephone; sidetone is the "user-speech signal echoed back to the user" that ordinary telephones generate in the user's ear to guide the user in how loud to talk. Ordinary telephones do not delay sidetone significantly – the speaker hears in the headset what he or she is saying essentially as he or she says it. Delayed sidetone is unacceptable to users; at best it sounds like "I'm talking in a barrel."

The CS50 ensures that the round-trip delay added by the two-way radio link is minimized by minimally-processing the speech signal in each hop of the radio link. No error-detection/retry algorithm is employed, as buffering the speech data to allow retries would increase the sidetone delay significantly. To mitigate interference-induced errors in the data representing the speech,

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<sup>9</sup> See, e.g., Letter from Steve Cahill, Principal RF Engineer, Plantronics, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 11-49, at 1-2 (filed Dec. 20, 2012); Letter from Steve Cahill, Principal RF Engineer, Plantronics, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 11-49, at 1 (filed Jan. 28, 2013); Letter from Steve Cahill, Principal RF Engineer, Plantronics, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 11-49 (filed Feb. 25, 2013); Letter from Steve Cahill, Principal RF Engineer, Plantronics, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 11-49 (filed Mar. 11, 2013).

the CS50 detects such errors and, when they occur, rapidly changes to a different frequency/timeslot-pair to operate in. The CS50 uses nine frequencies in the 902-928 MHz band, and each frequency is divided into 24 timeslots. Each system uses one of the available timeslots for transmit speech data and one of the available timeslots for receive speech data. During normal operation, the system periodically scans all other timeslots and channels during timeslots where it is not transmitting or receiving speech data, and keeps a record of the most-recent cleanest frequency/timeslots. When speech data errors are detected, the system quickly shifts operations to the cleanest available frequency/timeslot-pair. In this manner, many CS50 units operating in an ensemble self-arrange their selection of frequency and timeslot-pairs so as to minimize mutual interference, and other radio systems using the 900 MHz band are avoided as interference sources, and suffer minimal interference in turn.

The Progeny system, with its very-high-powered intermittent transmissions (100mS-long transmissions from each beacon, repeating at a 1 second rate) creates an “attractive nuisance” situation for the CS50 system. If the most-recent measurement happens to be taken on a given frequency when a proximate Progeny beacon is not transmitting, the CS50 will go to that frequency, and then when the Progeny beacon comes on for its 100mS transmit burst, the CS50 will experience an interference-induced audio corruption event, resulting in unacceptable noise or audio dropouts. The CS50 will then react to the interference by moving to another frequency that had been clear when last tested, but the problem can re-appear as a Progeny beacon starts to transmit on that frequency, leaving the user to suffer a series of unacceptable interference events.

The devices that Progeny claims to be “representative” of the Plantronics system are anything but – they are designed in a significantly different manner; and thus testing of them is not predictive of potential interference to the CS50 system.

Sennheiser wireless headphones. The Sennheiser headphone system uses a one-way radio link between a base unit and a pair of headphones. Unlike the CS50, the radio emission type is analog FM modulation of audio signals. Among the many features differentiating this system from Plantronics equipment is the interference-avoidance system. In the Sennheiser system, the end-user manually selects from one of three channels to choose the least interference. This system, by allowing the end-user to select the least-interfered channel manually, avoids issues with the “attractive nuisance” effect that Plantronics equipment experiences.

Brookstone outdoor wireless speaker. The Brookstone unit is an outdoor speaker with a one-way radio link between a base unit and a speaker. As with the Sennheiser system, the radio emission type is analog FM modulation of audio signals, and the Brookstone end-user manually selects from one of three channels to choose the least interference.

Motorola push-to-talk walkie-talkies. This device is a multiservice/multiband iDEN mobile phone that includes an off-network phone-to-phone capability in the 902-928 MHz band using a proprietary frequency-hopping system delivering half-duplex voice communications services, point-to-point and point-to-multipoint. It is not intended for high quality voice communications. Being a push-to-talk system, the underlying radio technology does not have tight constraints on the end-to-end delay for the audio through the radio link, and so can tolerate the delays and overhead associated with the buffering necessary to handle retransmissions of lost data. While Plantronics does not have access to the proprietary details of Motorola’s implementation of this off-network capability, given the modest constraints for delay required for the half-duplex service-type for which this system was designed, and given that the underlying radio access method is frequency-hopping, it is reasonable to assume that error-detection-and-correction mechanisms have been incorporated, and that Plantronics’ interference-

avoidance techniques of finding an empty frequency and timeslot is not employed in the Motorola system.

The Plantronics system also differs from the Motorola implementation in that the Plantronics systems use a stable frequency, rather than continuously frequency-hopping, and so mitigate interference by qualifying portions of the spectrum as “clean” or not, absent the presence of intermittently-operating very-high-powered transmitters such as Progeny is deploying. Reliance by Plantronics equipment on the process of qualifying portions of the spectrum as “clean”, given the difficulty of reliably detecting Progeny equipment’s intermittent transmissions, makes Plantronics equipment different than the “brute force” interference mitigation methods commonly incorporated in frequency-hopping systems.

Sony cordless telephone. The Sony cordless telephone is a vintage-1998 cordless telephone system that uses direct-sequence spectral spreading at 1.23Mc/second, and alternating transmit and receive bursts at 50% duty cycle each on a single frequency. Like the Plantronics system, the Sony system does change frequencies in response to interference that manifests as high error rate. However, because the Sony radio section alternates without pause between transmit and receive, there is no “dead time” for background scanning for empty frequencies (the Plantronics approach), so the Sony system instead scans at the moment of interference occurring, and then selects a clean frequency to re-establish on. The Sony approach differs in result from that used by the Plantronics system in that the Sony system has a much lower risk of selecting a fresh channel that’s become “dirty” since the measurement was done, because unlike the Plantronics system, the Sony system does not save measurements made in the past, but rather measures and moves at the point in time that the interference event occurs (at a cost of poor spectral efficiency and higher power consumption).

Both the Sony system and the Plantronics system, are designed so that once a unit has found a clear channel outside the Progeny system's occupied frequencies, interference is the only thing that causes an event where the unit will reselect and go to a new frequency. Unlike the Sony system, which is not normally used in high-density installations, the Plantronics system (where frequency re-use is inherent in the typical deployed system design) will occasionally need to reselect the best-available frequency to avoid interference from another nearby Plantronics device. Although perhaps not necessary for fair testing of the Sony system, any actual field testing of the Plantronics equipment would have to be in an environment where the occasional channel reselection inherent in a density installation would expose the "attractive nuisance" problem that Progeny's signals present for Plantronics equipment.

Further, while the Sony system has fixed transmit power similar to that of Plantronics equipment's transmit power when adapted to the maximum level, the Sony system benefits (at the expense of spectral efficiency) from direct-sequence coding gain of about 12dB. Plantronics equipment is FSK without coding gain; this configuration results in much better spectral efficiency (allowing optimum service to the target high-density market), but results in 12dB less link margin for the Plantronics equipment.

In short, none of the four devices that Progeny proclaims to be representative of Plantronics' wireless headset system is sufficiently similar that the test results for those devices are meaningful predictors of the potential for interference. Indeed, the proof is in the pudding – although Progeny proclaims that its testing of those four devices resulted in no unacceptable interference, Plantronics' preliminary testing of its wireless headset indicates that unacceptable interference is a serious concern.

## II. THE FOUR DEVICES PROGENY CLAIMS TO BE REPRESENTATIVE OF PLANTRONICS EQUIPMENT WERE NOT TESTED IN THE REQUIRED COOPERATIVE MANNER.

Even if one assumes, purely for purposes of argument, that the four devices cited by Progeny are somehow representative of Plantronics' wireless headset system, *not one was subjected to cooperative testing*. Rather, each was tested by Progeny or its agent without any third party verification that the testing methodology was appropriate for demonstrating compliance with Section 90.353(d) or that the testing was conducted properly in accordance with an appropriate methodology.

Progeny's excuses for not engaging in cooperative field testing of the devices it did initially test border on the absurd. Progeny would have the Commission conclude, for example, that because Progeny invited Itron to engage in joint testing, and that invitation was not accepted, somehow Progeny was absolved of the obligation to contact and engage in cooperative testing with any other Part 15 manufacturer.<sup>10</sup> Not surprisingly, Progeny can point to nothing in any Commission decision to date supporting that assertion. Similarly, Progeny claims that because neither Itron, Landis + Gyr nor the Wireless Internet Service Providers Association suggested testing Plantronics' wireless headset system when joint testing was done,<sup>11</sup> somehow Progeny is absolved of its obligation. Yet, once again, Progeny can point to nothing in any Commission decision to date supporting that assertion. To the contrary, the Commission has made clear that its object is to "provide certainty for *all users* of the band,"<sup>12</sup> something that will not occur if Progeny's obligation to engage in cooperative testing is limited in the fashion it suggests.

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<sup>10</sup> See Progeny Opposition at 18.

<sup>11</sup> See *id.* at 38.

<sup>12</sup> 1995 LMS Order, 10 FCC Rcd at 4696 ¶ 2 (emphasis added).

Perhaps recognizing that these excuses are unpersuasive, Progeny argues that it was under no obligation whatsoever to conduct cooperative testing – an argument that is too cute by half. The Commission’s 1995 and 1997 decisions permitting M-LMS entry into the 902-928 MHz band clearly anticipated that the actual field testing to establish compliance with Section 90.353(d) would be conducted on a cooperative basis between Progeny and potentially affected Part 15 interests,<sup>13</sup> as did the 2011 grant of Progeny’s request for waivers of certain rules that effected a fundamental change in the nature of Progeny’s offering over its M-LMS spectrum.<sup>14</sup> While it is true that the Commission did not incorporate the cooperation requirement into Section 90.353(d),<sup>15</sup> the Commission has ruled that a directive in a Commission order that was promulgated subject to notice and comment rulemaking proceedings and that was published in the *Federal Register* can constitute a binding rule, even if the directive is not codified.<sup>16</sup> Language mandating cooperative testing was included in the *1997 M-LMS MO&O*<sup>17</sup> and was included within the summary of that decision published in the *Federal Register*.<sup>18</sup> Thus, the fact that the requirement is not specifically codified in Section 90.353(d) is of no moment.

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<sup>13</sup> See *id.* at 4737 ¶ 82; Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, *Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 12 FCC Rcd 13942, 13968 ¶ 69 (1997) [“1997 M-LMS MO&O”].

<sup>14</sup> *2011 Waiver Order*, 26 FCC Rcd at 16887 ¶ 25.

<sup>15</sup> Progeny Opposition at 18-19.

<sup>16</sup> Applications for Consent to the Transfer of Control of Licenses from XM Satellite Radio Holdings Inc. to Sirius Satellite Radio Inc., *Memorandum Opinion and Order and Report and Order*, 23 FCC Rcd 12348, 12420-21 ¶ 158 (2008).

<sup>17</sup> *1997 M-LMS MO&O*, 12 FCC Rcd at 13968 ¶ 69.

<sup>18</sup> 62 Fed. Reg. 52036, 52042 ¶ 42 (Oct. 6, 1997) (“The purpose of the testing condition is to insure that multilateration 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 in their area, and to verify through cooperative testing that this goal has been served.”) (emphasis added).

For these reasons, it is not surprising that the *Order* recognizes that Progeny was under an obligation to engage in cooperative field testing of representative devices.<sup>19</sup> Because Progeny clearly did not engage in any cooperative field testing of any devices representative of Plantronics' 902-928 MHz band wireless headset system, the *Order* should be reconsidered and the relief requested by Plantronics granted.

### III. CONCLUSION

For the reasons set forth above and in Plantronics' Petition, Plantronics respectfully requests that the Commission reconsider the *Order* and either require Progeny to engage in cooperative testing with Plantronics or any manufacturer of similar devices consistent with the requirements of Section 90.353(d) of the Rules, or condition Progeny's authorization to operate as proposed in Plantronics' Petition to provide Plantronics and its customers with the level of certainty that Section 90.353(d) was intended to provide.

Respectfully submitted,

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August 2, 2013

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<sup>19</sup> See *Order*, 28 FCC Rcd at 8559 ¶ 10.

## CERTIFICATE OF SERVICE

I, Karla E. Huffstickler, with the law firm of Wilkinson Barker Knauer, LLP, hereby certify that on this 2nd day of August, 2013, I served a true copy of the foregoing Reply to Opposition to Petitions For Reconsideration by depositing a copy thereof with the United States Postal Service, first class postage prepaid, addressed to the following:

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