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February 17, 2012

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: Cellphone-Mate Inc.
Permitted Oral Ex Parte Presentation
WT Docket No. 10-04

Dear Ms. Dortch:

On December 6, 2012, representatives of Cellphone-Mate Inc. ("Cellphone-Mate") met with representative of the Commission staff to discuss the above referenced proceeding.[1] A significant portion of the discussion focused on methods that are available to ensure that the brief signal transmission delays that are caused by signal boosters do not impair the capabilities of position location services that employ Uplink Time Difference of Arrival ("U-TDOA") technologies. Cellphone-Mate explained that operators of U-TDOA position location services can employ techniques to identify handset transmissions that are emanating from signal boosters and incorporate them in their signal processing and calculations to produce even more accurate location determinations than would have been possible without the assistance of a signal booster.

In this regard, particular attention was given to the ex parte presentation of AT&T Services, Inc. and TruePosition, Inc., dated December 23, 2011 ("TruePosition Presentation"), which described a possible scenario in which several cell towers are able to receive the signal of a handset, measure the time of arrival ("ToA") for the signal to each tower, and determine the approximate location of the handset by calculating the time difference of arrival ("TDoA") for the handset signal to each tower.[2]

[1] *See* Cellphone-Mate Inc., Notice of Permitted Oral Ex Parte Presentation, WT Docket 10-04 (Jan. 10, 2012).

[2] *See* AT&T Services, Inc. and TruePosition, Inc. Notice of *Ex Parte* Presentation, Attachment at 4 (Dec. 23, 2011) ("TruePosition Presentation").

According to the TruePosition Presentation, some cell towers in the same area, however, might not be able to hear the signal from the handset, but could hear the retransmitted signal of the handset through an associated signal booster.[3] Because of the slight delay in the boosted signal, the cell towers that heard the boosted signal would produce a ToA that was slightly larger than it would have been absent the booster, potentially injecting error in the position location determination.[4]

As TruePosition appears to acknowledge, transmission delays caused by signal boosters are very minor and would produce only small discrepancies in the accuracy of TDoA position location services (comparable with the margin of error that is inherent in such services). In any event, Cellphone-Mate believes that approaches are available to prevent signal boosters from injecting any error in the calculations of TDoA networks. One option that was discussed during the meeting was for the cell towers to use the unique RF characteristics that are inherent in a wireless transmission that has passed through a signal booster to identify the existence of the signal booster and account for the signal booster when processing the TDoA information for position location purposes.

The approach to achieve this rests on the fact that modern digital cellular networks always carefully measure and control the RF signal power levels transmitted to and from each handset operating on the network. In order to accomplish this, the downlink RF signal strength received by the wireless handset is reported back to the network in a timely fashion.

Modern cellular networks can also measure fairly accurately the approximate distance from a tower to a handset using the ToA of the handset signal or other methods. Using this information, the tower can easily predict how strong the downlink RF signal strength should be received at the handset in a best-case scenario (meaning the signal is traveling in free space to a handset with direct line-of-sight of the tower) based on a power versus distance equation.

These factors can be used by operators of wireless networks to determine the existence of a signal booster. The unique characteristic of signal boosters as compared to all other objects situated between cellular towers and wireless handsets is that only signal boosters can increase RF signal strength to a signal-receiving wireless device. Conversely, all other objects, including walls, trees, hills, etc., will always decrease signal levels at the receiving end. Further with signal boosters, the RF signal strength that the wireless handset receives and reports back to the tower can be controlled by the signal booster and set even stronger than what would be possible in a relative best-case scenario.

Because of this, if a closely located tower determines that a wireless handset has reported receiving an RF signal level that is higher than it should be in a best-case scenario, it is a strong indication of the existence of a signal booster.

[3] *See id.* at 7.

[4] *See id.*

The signal delay caused by a signal booster is another signature factor which could further help identify the existence of a signal booster. With the delay, the time of arrival measured by the tower will be a little longer, indicating to the tower that the signal booster and wireless handset is even further away, and in turn should receive even less RF power. When a signal booster is present and aiding in providing a cellular signal, the tower will be alerted at the even greater level of discrepancy between what the RF signal level should be versus what the wireless handset is reporting, thus further helping to identify the existence of a signal booster.

To further eliminate any chance of misidentification, signal boosters could be designed to intermittently adjust their downlink power gain in a predetermined pattern. These repetitious adjustments would be reported back to the network by the handset and provide an unmistakable indication that a signal booster is in use.

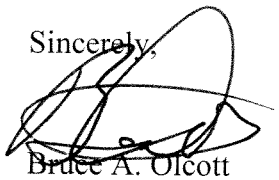
The method proposed above would require only minimal adjustments both with respect to the design of the signal booster and the operation of the location measurement unit ("LMU"), all of which possibly could be accomplished with a software upgrade. Once cell towers are able to identify the locations of relevant signal booster, the U-TDOA network operator should be able to use this information to compensate for the signal delays or better yet, use the delays to offset each other and make the position location process more accurate than what would be possible without the use of a signal booster.

The proposed approach would most likely result in more accurate location determinations for at least two major reasons. First, the U-TDOA operator could include in its calculations the ToAs and thus TDoAs from all of the cell towers that could hear the boosted signal, which may be greater than the number of towers that could hear the signal directly from the handset. Second, the boosted signals should provide improved signal strength and quality, which could also enhance the accuracy of the location measurement process.

Given the above, signal boosters could easily facilitate and improve the position location process, aiding public safety and benefiting the public. This benefit would be in addition to the core advantage of signal boosters – enabling consumers to complete calls, including emergency E911 calls – that may not have been possible absent the use of a signal booster. Given these significant public interest benefits, the Commission should promptly complete the process of adopting rules enabling and encouraging the continued use of properly designed signal boosters by the public.

Please contact the undersigned if you have any questions.

Sincerely,



Bruce A. Olcott
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