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

In the Matter of

Information Sought On Methods For	)	ET Docket No. 99-300
Verifying Compliance With E911	)	DA 99-2130
Accuracy Standards	)	

COMMENTS OF MOTOROLA

Motorola, Inc. ("Motorola") respectfully submits these comments in response to the *Compliance Public Notice* released by the Office of Engineering and Technology ("OET") and the Wireless Telecommunications Bureau ("WTB").[1] Motorola urges the Commission to not mandate any particular compliance methodology but rather to specify the circumstances under which such testing must be accomplished. Motorola asks that the Commission only clarify very specific areas of concern for location accuracy compliance and permit the industry to continue its efforts to reach an all encompassing, standardized methodology for accuracy determination.

BACKGROUND

In its *Third Report and Order* in CC Docket 94-102,[2] the Commission tasked OET and WTB to expeditiously develop and publish methods that could be used for verifying compliance with Automatic Location Identification ("ALI") accuracy requirements.[3] The *Third Report and Order* required two levels of accuracy for each ALI technology (*i.e.*, handset-based or network-

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[1] *See* Public Notice, Information Sought on Methods for Verifying Compliance with E911 Accuracy Standards, released October 8, 1999, DA 99-2130 ("*Compliance Public Notice*").

[2] *See* Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, *Third Report and Order*, FCC 99-245, released October 6, 1999. ("*Third Report and Order*")

[3] *See Third Report and Order* at ¶ 85.

based).[4] OET and WTB were directed to work along with all interested parties, including equipment manufacturers, system operators, public safety organizations, standards groups, and organizations with relevant expertise in performing such measurements.[5] OET and WTB were also expected to take into account the practical and technical realities of the provision of ALI service, including the fact that not all calls can be completed, nor can ALI always be provided.[6] Further, the Commission recognized that the methodology for ALI verification may need to give appropriate weight to the variety of conditions and locations in which wireless equipment is used.[7]

In view of this, the Commission released a public notice requesting technical information on measuring the accuracy of ALI systems.[8] The *Compliance Public Notice* asked a litany of questions concerning measurement requirements and techniques for verifying ALI system compliance and additionally requested information on the elements that should be taken into account or incorporated into a test procedure for E911 compliance.

I. THE COMMISSION SHOULD NOT MANDATE PARTICULAR TESTING REQUIREMENTS.

As was made clear in the *Third Report and Order*,[9] the Commission should not take any action to require wireless carriers and equipment manufacturers to follow any mandatory procedures for ALI compliance. Wireless providers and equipment manufacturers have spent a great deal of time designing rigorous testing requirements for comparing the myriad of location technologies currently available in the marketplace. Up until the adoption of the *Third Report*

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[4] *See Third Report and Order* at ¶¶ 72, 74. Specifically, network-based systems were required to achieve an accuracy of 100 meters for 67 percent of all calls and 300 meters for 95 percent of all calls. Handset-based solutions were required to meet an accuracy of 50 meters for 67 percent of all calls employing the handset-based solution and 150 meters for 95 percent of all calls.

[5] *See Third Report and Order* at ¶ 85.

[6] *Id.*

[7] *Id.*

and Order, these efforts were made to ensure that equipment would be providing accuracy levels in accordance with the 125 meter, Root Mean Square ("RMS") requirements adopted by the Commission.[10] Furthermore, the Commission has now created two categories for location accuracy dependent upon location technology that were never contemplated previously. It is therefore inappropriate for the Commission to expect the wireless industry to provide detailed testing and verification requirements that comply with the new ALI accuracy standards in such a short period of time. The *Compliance Public Notice* has only provided affected parties three weeks of time to study this issue and attempt to furnish the Commission with meaningful technical data and information. Thus, Motorola strongly urges the Commission to reaffirm that any testing and verification proposals it provides are strictly guidelines that may be used for demonstrating ALI compliance.

II. ANY TEST PROCEDURE MUST TAKE INTO ACCOUNT THE PRACTICAL REALITIES OF WIRELESS SERVICE.

As the Commission recognized in promulgating its changes to the ALI accuracy requirements, there are physical characteristics associated with wireless service that cannot be ignored in attempting to provide ALI accuracy guidelines.[11] Motorola asks that the Commission consider these factors in adopting any ALI compliance proposals.

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[8] *See Compliance Public Notice* at page 1.

[9] *See Third Report and Order* at ¶ 85.

[10] *See* Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, *Memorandum Opinion and Order*, 12 FCC Rcd at 22726; *See also* 47 C.F.R. § 20.18(e).

[11] *See Third Report and Order* at ¶ 85.

Call Completion. In order for an E911 attempt for ALI to be counted towards the accuracy standards – whether a network or handset-based solution is employed – the first premise should be that the wireless call is actually completed. Each location technology has its individual strengths and weaknesses, but none can overcome a situation where a call cannot be completed. Motorola asks that the Commission affirm that where a wireless call is unable to be completed, ALI should not be expected nor should such an attempt be counted towards the location accuracy requirements.

Weighting of Data. The Commission also recognized that any potential methodology for ALI compliance measurement may need to give weight to the variety of conditions and locations in which wireless equipment is used.[12] For example, if the normal calling patterns for a wireless carrier had a much higher rural component than urban, the location accuracy methodology could weight rural calls more heavily than those placed in urban environments as part of the recommended test measurement procedures. Motorola strongly supports the use of weighting for any guidelines surrounding verification of ALI systems. However, Motorola believes that it is unclear that there is sufficient record for the Commission to adopt any weighting guidelines at this time. Motorola urges the Commission to work with the wireless industry and public safety community to establish a weighting methodology that is based upon wireless E911 calling patterns. Such information should generally be available from Public Safety Answering Points ("PSAPs") and, with this data, the Commission would be in a position to develop a weighting recommendation that would enable the proper measurement of ALI technology accuracy.

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[12] *Id.*

Ground Truth Determination. Quite possibly the most critical factor in determining wireless unit location is ascertaining the reference location or "ground truth." In order to verify that ALI systems are properly functioning, it is crucial to have a point of reference for determining accuracy. Ground truth provides such a reference point so that measurements can be taken that are based upon an exact and accurate location. Use of a surveying company or corrected GPS measurements to establish the ground truth points are methods that have been employed for previous testing and measurement procedures. Motorola urges the Commission to clearly specify the level of accuracy expected for ground truth. Determination of ground truth can be a costly, time consuming exercise and is highly dependent on how exacting a measurement must be made. Motorola suggests that ground truth accuracy on the order of 1 meter may possibly be sufficient for ALI compliance, given the overall accuracy requirements for Phase II location. However, again Motorola notes that there has been a lack of record discussion of this issue and asks that the Commission seek out industry and affected public safety entities for further guidance on this vital parameter.

Vertical Location. Any proposed methodology to measure location accuracy should only contain horizontal components– that is latitude and longitude as directed by the Commission's accuracy standards – in order to demonstrate system compliance. Any proposal or recommendation to include a vertical component for location accuracy would be counter to the Commission's decisions in the *Third Report and Order* that limited location accuracy discussions to latitude and longitude.[13] The Commission sought notice and comment on this issue and has never determined that a vertical location component was a required parameter for E911 ALI.[14]

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[13] *See Third Report and Order* at ¶¶ 69-77.

[14] *See* Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling

Therefore, Motorola asserts that any assumptions concerning vertical location (*i.e.*, what floor of a building the call is coming from) should not be included as part of any Commission recommendation for compliance measurement.

Statistical Reliability. Another important parameter that the *Compliance Public Notice* discussed was the statistical confidence necessary for ALI measurements.[15] Obviously, the more location measurements, the higher the level of confidence in the data. However, each additional test measurement adds extra complexity, time and cost to any compliance program. Therefore, Motorola recommends that the Commission consider any test procedure that provides enough measurements for an 80 to 90% level of statistical confidence to be fully acceptable in demonstrating compliance. This benchmark should be properly vetted among interested parties to ensure that the reliability of testing measurements is achievable prior to any Commission final recommendation and also meets with the requirements of the Commission and public safety community.

Any parameters defined by the Commission concerning ALI accuracy must provide clarification of these items. Motorola asks that the Commission clearly define these requirements in order to ensure the suitability of its guidelines for verification.

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Systems, CC Docket No. 94-102, *Second Report and Order and Further Notice of Proposed Rule Making*, 11 FCC Rcd at 18743-44.

[15] *See Compliance Public Notice* at 2.

III. THE COMMISSION SHOULD RELY ON INDUSTRY STANDARDS FOR OVERALL ALI COMPLIANCE

As the Commission has recognized throughout development of ALI requirements, location of wireless mobile units is an extremely complex and difficult task.[16] Furthermore, the Commission has acknowledged the efforts of the industry to work collaboratively to resolve technical issues associated with ALI in order to achieve the most effective systems possible.[17] Motorola strongly encourages the Commission to permit the wireless industry to continue the progress it has made in establishing uniform standards for the measurement and evaluation of ALI systems.[18] Any efforts to attempt to establish comprehensive Commission guidelines based on only a three week time period for public comment, with no allotment for reply comments, would be misguided. Although the industry efforts have been extensive, they still remain incomplete. Thus, it would be improvident to attempt to have the Commission determine any extensive guidelines based on preliminary data and measurements done to this date.

Therefore, other than the needed clarifications concerning location accuracy measurement, Motorola asks the Commission to continue to allow the wireless industry to proceed in its development of standardized testing that gives an accurate representation of the ALI capabilities of all technology, under a variety of circumstances.

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[16] *See e.g., Third Report and Order* at ¶ 83.

[17] *See e.g., Third Report and Order* at ¶ 84.

[18] As an example, the CDMA Development Group has drafted an extensive test plan that is close to being finalized. This test plan was developed through the cooperation of wireless carriers, equipment manufacturers and third party vendors. *See CDG Test Plan Document for Location Determination Technologies Evaluation (Rev. 0.6).* This test plan was derived for reasons other than simply for location accuracy and would require significant review and modification for use for any potential Commission guidelines.

CONCLUSION

For the reasons set forth above, Motorola asks that the Commission ensure that any verification guidelines adopted be strictly suggested, rather than mandatory. Further, such guidelines must clarify several particular parameters associated with test measurements to assure the wireless industry and public safety entities that ALI equipment is in compliance with Commission requirements. Finally, Motorola urges the Commission to defer to the industry standardization efforts to ensure that uniform procedures are adopted to test ALI equipment in a multitude of environments. Through these efforts, the Commission will be in a position to ensure that the most effective location solutions are employed throughout the nation.

By: _____/s/_____

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