

# LAND MOBILE COMMUNICATIONS COUNCIL

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## MEMBER

AAA

December 12, 2007

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AASHTO

AFWA

Fred Campbell  
Chief, Wireless Telecommunications Bureau  
Federal Communications Commission  
445 Twelfth Street, SW  
Washington, D.C. 20554

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Derek Poarch  
Chief, Public Safety and Homeland Security Bureau  
Federal Communications Commission  
445 Twelfth Street, SW  
Washington, D.C. 20554

EWA

FCCA

FIT

IAFC

IMSA

ITSA

Re: Mobile Station Protection for Centralized  
Trunked Systems

MRFAC

NASF

PCIA

Dear Messrs. Campbell and Poarch:

TIA

UTC

It has recently come to the attention of the LMCC that some applications for centralized trunking stations are being returned or denied on the basis of a very restrictive interpretation of Section 90.187 of the FCC Rules and Regulations. Specifically, the LMCC believes that the protection now being required for mobile stations is excessive and propagation tools are being applied incorrectly. LMCC is asking the Commission to consider an alternative to what is currently being required, particularly for public safety applications.

Section 90.187(b) requires that applicants for new centralized trunked stations (classes FB8 and MO8) protect the service contours of incumbent co-channel and adjacent channel stations. Adjacent channel protection requirements are based on the bandwidth of the proposed system. Generally, the interference contour of a proposed centralized trunked station should not overlap the service contour of an incumbent protected station.

Protection of incumbent base stations by proposed base stations is very well defined. The fixed locations of all stations are known and the appropriate contours can be easily calculated with propagation software that implements the Commission's R-6602 propagation curves. If no prohibited contour overlaps occur, the proposed station can be granted.

The issue is more complex with regard to protection of mobile stations, whether proposed or incumbent. In particular, the exact location of mobiles is never known and, in fact, at best might be characterized by some type of statistical sampling simulation. Three circumstances arise with regard to mobiles. First, how should a proposed MO8 mobile be treated when analyzing its potential to interfere with an incumbent fixed station? Second, how should the proposed MO8 mobile be modeled when protecting an incumbent mobile station? Finally, how should a proposed FB8 base station protect an incumbent mobile?

Coordinators are now being asked to show mobile protection, at least for some applications, by placing the mobile at the edge of its licensed or proposed area of operation, in the direction of the proposed or incumbent station, and then calculating R-6602 contours. This approach suffers major flaws. First, it protects mobiles in areas where they may rarely, if ever, be operating. At least for mobiles operating with associated repeaters, they generally operate within the service area of the repeater, which may be tens of kilometers less than their licensed area of operation. Even if they do operate at the edge of the service areas, mobiles would be in a given location, where some interference might occur, only a small percentage of the time. Second, at least in the mobile to mobile case, both the proposed and incumbent mobiles would have to be in exactly the right locations for interference to occur and then be trying to communicate exactly at the same time. Finally, the R-6602 curves always calculate contours at a minimum of 30 meters AAT, even though the mobile antennas would be a maximum of 2 meters above ground. This often results in excessively large service and interference contours being generated. Thus, a requirement to use R-6602 curves to predict mobile service and interference contours will often result in inaccurate contours. To our knowledge, no software would accurately predict such contours, as the Commission's original R-6602 curves are undefined below 30 meters AAT. Staff at RadioSoft confirmed LMCC's belief about how ComStudy calculates service and interference contours.

It is important to look at each of the three situations described above. In the case of a proposed MO8 station protecting an incumbent fixed station, the coordinators are being asking to place the proposed MO8 at the edge of its requested area of operation in the direction closest to the incumbent fixed station. The R-6602 interference contour would then be drawn and if it overlapped the service contour of the fixed station, the proposal would fail. This overprotects the fixed station in two ways. First, the proposed mobile would be at that location only a fraction of the time, if at all, leading to little likelihood of interference. Second, the MO8 interference contour would most likely be excessively large, as it would be calculated at a minimum of 30 meters AAT. From a coordination standpoint, requiring this level of protection is simply poor spectrum

management. It prevents licensing stations that could operate quite successfully without ever causing actual interference.

The second situation is a proposed MO8 protecting the licensed service area of an incumbent mobile station. In this case, coordinators must place both mobiles at the edge of their proposed and licensed areas of operation. An interference contour would be drawn for the proposed MO8 and a service contour would be drawn for the incumbent mobile. If overlap exists, the proposal would fail. Again, this level of protection is excessive. Both contours would likely be overly large and the probability of both mobiles being in such locations and transmitting for any appreciable time, if ever, would be nearly zero. There is an additional flaw in this case. The service contour of the incumbent mobile would be outside the area in which it is licensed to operate and thus not entitled to any protection.

The third situation considers how a proposed FB8 should protect an incumbent mobile. The coordinators are being asked to place the incumbent mobile at the edge of its licensed service area and then its service contour be drawn. If that contour overlaps the interference contour from the proposed FB8, the proposal fails. In this case, the interference contour of the FB8 should be accurate, but the mobile service contour would likely be excessively large. Again, the probability of interference is related to the chances of the incumbent mobile actually being in an area in which interference could occur and actually trying to communicate. This situation also, as in the above case, protects the incumbent mobile in an area in which it cannot legally operate.

In all three cases, treating mobile operations as if they were permanent fixed locations in the worst possible places is poor spectrum management. The protection process utilizes a faulty propagation model, never having been intended to predict mobile contours. In fact, the R-6602 curves were originally developed to predict contours from television stations to home antennas at 10 meters above ground. Later, it was determined that R-6602 could be used to predict contours from land mobile *base stations to mobile units* by derating the results by 9 dB to account for mobile receive antennas being 2 meters above ground. The curves have never been tested or modified to predict service or interference contours for mobile stations with transmit antennas at only 2 meters above ground. Using them for that purpose produces inaccurate results. Manual extrapolation of the curves suggests that an additional 10 to 12 dB derating factor would begin to produce more realistic results.

In addition to all of the above arguments, there is one additional argument in favor of a relaxed standard. Almost all radio systems utilize some type of tone or digital squelch. This prevents a radio from responding to a co-channel user for channels in a shared environment. This feature would prevent an incumbent station from actually hearing the proposed station even if the proposed station were in a position to cause interference unless the incumbent station were actually communicating at exactly the same time. Merely being in the vicinity where interference might occur does not mean that the incumbent station would even be aware of the situation.

LMCC has been concerned about how to properly treat mobiles for some time. LMCC is aware that RadioSoft is working on a statistical sampling prediction model that will be far less onerous than the procedures that the Commission is now requiring. As with all predictions of contours, service areas, or interference areas, probability plays an important factor. That factor is being ignored in what is now being asked of the coordinators. Until a workable probabilistic model can be employed, the LMCC suggests that interim procedure be embraced by the Commission.

A review of the *Second Report and Order* in Docket 92-235 (FCC 97-61 – Refarming Docket), the Order that adopted the trunking rules, provides no guidance on treatment of mobile stations. Neither is there any guidance in the *Third Memorandum Opinion and Order* (FCC 99-138) which adopted the contour protection rules. What is instructive about the *Third Memorandum Opinion and Order* at paragraph eight is that the Commission decided to rely on the certified frequency coordinators to evaluate proposed trunking applications. This was codified in Section 90.187(b)(2)(iv). Paragraph eight also says that the “only restriction we will place on the process is that the contour prediction methodology used represent the consensus of all certified frequency coordinators.”

The Commission has already issued an *Order* on delegated authority that provides a workable interim solution and that all frequency coordinators agree to. DA 07-4113 at footnote 18 details that solution. That footnote reads, in part, as follows:

"We recognize that it is not practical for a frequency coordinator to analyze the potential for interference of operations from every possible location authorized for mobile or temporary fixed operations. Consequently, we believe that it is sufficient, as an initial matter, to coordinate a temporary fixed or mobile-only application based only on the center coordinates of the authorized service area, as AAA apparently did in this case. See AAA Response at 1. Once an interference complaint is received, however, it is necessary to conduct a more detailed analysis."

LMCC understands that the above relates to an application in the 470 – 512 MHz band ("T-band"), but LMCC believes that it should apply for all VHF and UHF bands. Absent a better prediction tool, this approach represents a realistic compromise between excessive protection of mobiles and insufficient protection. In addition, the coordinators have knowledge of how channels are being used in an area that puts them in a position to make an informed decision about interference potential. The Commission has relied on the expertise of the coordinators for over a half century and we request that this reliance continue. The combined experience of the certified frequency coordinators represents hundreds of years of experience in successful spectrum management. The coordinators should be given the flexibility to utilize their knowledge and experience in making judgments about protection of mobile operations.

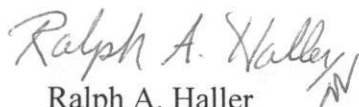
LMCC has polled each of the land mobile frequency coordinating committees, and all are in agreement with the above recommendation. In fact, they had previously

agreed among themselves to use this methodology even before the Commission's *Order*. Most existing centralized trunked systems that are on the air today have been coordinated using the suggested procedure and there is no record of excessive interference to incumbents. All coordinators agree that if interference occurs, additional steps on the part of the coordinating committee will be required. But, all also believe, that cases of interference will be rare. This agreement constitutes the consensus among coordinators that was contemplated by the *Third Memorandum Opinion and Order*.

LMCC is not suggesting a rule change at this time. We simply request that the Commission interpret the above procedure to be in compliance with the intent of the rule section. Once a reliable model becomes available to predict mobile interference, we anticipate petitioning for rule making to allow use of the model. Adoption of this interim interpretation will harmonize frequency coordination in both the VHF and UHF bands and make interpretation of the requirements of Section 90.187 consistent between the Wireless Telecommunications Bureau and the Public Safety and Homeland Security Bureau.

LMCC urges the Commission to embrace the above suggestion. Given that the Commission has a number of applications pending that involve this issue, we ask for an expedited decision. We look forward to a successful resolution of this issue.

Sincerely,

A handwritten signature in cursive script that reads "Ralph A. Haller". The signature is written in dark ink and includes a stylized flourish at the end.

Ralph A. Haller  
President