

December 14, 1999

Magalie Roman Salas  
Secretary  
Federal Communications Commission  
TW-A325  
445 Twelfth St., SW  
Washington DC 20554



Re: *Ex Parte* presentation in MM Docket 99-25

Dear Ms. Salas:

On Friday, December 10 myself and Dr. Theodore Rappaport met on behalf of the United Church of Christ, *et al.* ("UCC *et al.*") with the following Commission staff: Tom Power, Rick Chessen, David Goodfriend, Susanna Zwerling, Bruce Franca, Dale Bickel, Brian Butler, William Scher, and Steve Klitzman. The purpose of the meeting was to go over UCC *et al.*'s technical submission in the low power radio proceeding.

During the course of the meeting two hand-outs were distributed, each of which are filed separately. We largely reiterated the points made in UCC *et al.*'s reply comments, filed on November 15, 1999 in this docket. We explained that UCC *et al.* support removing second and third adjacent protection for 100 and lower watt stations, but believe that full interference protection is necessary for 1000 watt stations. Dr. Rappaport explained that he reviewed the studies submitted by the NAB and CEMA as he would review an academic journal paper or other work, and that many conclusions contained in these studies would not hold up in an academic setting.

Dr. Rappaport and myself explained why UCC *et al.* believe that the conclusions of the technical studies submitted by the National Association of Broadcasters and the Consumer Electronics Manufacturer's Association are incorrect. We explained that the NAB and CEMA used unrealistic performance measures to test radios. In order to demonstrate that low power radio would harm radios broadcasts, the studies were forced to assume that a majority of radios are already incapable of receiving broadcast signals in today's environment. Radio reception that the NAB would label as "unacceptable" is perfectly acceptable to millions of consumers today, as demonstrated by the wide popularity of many of the radios that the NAB tested and found inadequate under their unrealistic standards. In addition, the NAB did not demonstrate the incremental effect on interference of introducing a low power radio service.

Dr. Rappaport explained that, at most, only 1.6 percent of the population will experience unacceptable interference after low power radio is introduced. He explained that the 1.6 figure is a worst-case scenario and that most listeners will not experience any inconvenience because they may not be listening to the one or two broadcasts adjacent to the low power station, and even if they are, they may be able to resolve the problem by relocate their radios. Dr. Rappaport explained he arrived at the 1.6 figure by performing an extensive computer simulation based on the FCC's computer

program. He improved the program by increasing its granularity, and performed an analysis for both 10 watt and 1 watt stations with and without second and third adjacent channel protection. He concluded that removing third adjacent channel protection will cause little additional interference but will result in over 400 more low power radio stations. In response to questions, Dr. Rappaport stated that, as proposed, low power radio stations will have sufficient power to reach a significant audience.

Finally, we discussed the impact of low power radio on the transition to digital radio. Dr. Rappaport explained the tiny impact that stations of 100 and fewer watts will have on the spectrum. With this small amount of energy, digital radio -- which has already been engineered to operate in the current environment -- should have no trouble accommodating low power radio.

Pursuant to Section 1.1206(b), 47 C.F.R. §1.1206, this letter and two attachments are being filed with your office.

Sincerely,

Cheryl A. Leanza  
Deputy Director

attachments

cc: Tom Power  
Rick Chesson  
David Goodfriend  
Susanna Zwerling  
Bruce Franca  
Steve Klitzman

**United Church of Christ *et al.* Technical Presentation on LPFM  
December 10, 1999**

**Dr. Theodore Rappaport, P.E., Wireless Valley Communications, Inc.  
Cheryl A. Leanza, Deputy Director, Media Access Project**



***Adoption of LPFM will serve the goals of the FCC: it will preserve existing services and provide new service offerings by increasing spectrum utilization.***

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Proposed technical compromise:

**Eliminate both second and third adjacent protection for 100 or fewer watt stations.  
Make no change in protection standards for 1000 watt stations.**

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UCC *et al.*'s technical submission. Through significant financial support of the John D. and Catherine T. MacArthur Foundation and George Soros's Open Society Institute, in addition to others, Dr. Rappaport and the staff at Wireless Valley undertook a thorough review of the studies and information submitted to the FCC. In addition to analyzing information submitted by others, Dr. Rappaport engaged in extensive computer modeling to demonstrate the feasibility of low power radio stations of 100 or fewer watts.

**❖ Adoption of 100 or fewer watt stations retains the benefits of the LPFM proposal while alleviating the technical concerns of the industry.**

- These smaller stations will make almost no impact on current broadcasts.
- At least *600 low power radio stations* of 100 or fewer watts can be deployed *in the top 60 markets alone* without harming current radio broadcasts.
- At most, *1.6 percent of the listeners served will experience interference*. That 1.6 percent will experience interference only under the following circumstances:
  - First, the listener must want to hear only one particular incumbent station of the many available.
  - Second, the LPFM station must be near the coverage fringe of that incumbent station.
  - Third, that incumbent station must transmit on a channel 2 or 3 channels above or below the LPFM station's assigned frequency.
  - Fourth, the radio receiver must be a poor performing table radio such as a clock radio.
  - *Fifth, the listener must not be able to relocate his or her radio to improve reception.*
- Eliminating both second and third adjacent protections for 100 watts and fewer increase substantially the number of stations that can be authorized, thus making the creation of LPFM more meaningful.
- The industry's arguments themselves demonstrate that they are not concerned about stations with 100 or fewer watts. For example, both the NAB and Disney/ABC criticize lower wattage stations for the interference they will *incur*, not the interference they will cause.
- Currently, the blanketing interference accepted by the FCC for full power stations, which eliminates listener reception of *all* broadcasters, exceeds the second and third adjacent channel interference that LPFM stations would cause, which affects only broadcasters on adjacent channels.
  - For example, the largest full power stations, a class A station, emits a blanketing interference area of almost 19 square miles, whereas a 100 watt station would cause adjacent interference in a 0.6 square mile area.

❖ **The NAB and CEMA studies ask the wrong question.**

- Contrary to the proposition of NAB and CEMA, FCC protection ratios do not accurately measure consumer satisfaction with radio reception.
- In order to accept the conclusions of the NAB and CEMA, one must conclude that most radios today do not perform acceptably. This is clearly false.
- No comparison was made between older radio receivers and newer radio receivers.
- Radio receiver performance is based on the actual real world environment, the tolerance of the consumer, and the design/cost tradeoffs made by the manufacturer, and has absolutely nothing to do with how the FCC assigns FM broadcast station licenses. The studies bear this out. The radios tested did not meet the standards assumed by FCC protection ratios, but they are common radios in use in the market today.
- The real-world interference environment is much more forgiving than the FCC ratios indicate, which is why modern receivers are designed less stringently than the ratios indicate.
- The NAB and CEMA favor a double standard: if the Commission were to adhere to the sound standards utilized by the NAB and CEMA for LPFM, the Commission would be forced to reduce the number of full-power stations currently authorized.
- The NAB chose a sound quality threshold that *fifty-four percent* of the radios tested *failed to meet, absent projected LPFM interference*.

❖ **The NAB mapping study is engineered to misrepresent interference caused by LPFM.**

- The NAB's mapping study counts the number of radios, not the number of listeners, that might experience interference under the NAB's unusually high standards for listening quality.
- The NAB admits that it combines the worst performing characteristics of different radios to create a hypothetical "worst radio." Not only does the NAB provide no evidence that such a radio exists, but the NAB's initial selection of low-performing radios makes the hypothetical worst radio even less defensible.
- The NAB chose to map the worst of their three test results, when another measure would have been the most representative choice.
- The NAB mapping study does not hold up to peer review because it does not disclose the underlying methodology used to produce its maps.

- The NAB maps visually over represent interference with LPFM because they combine current full-power station interference with LPFM projected interference.

❖ **Digital Radio Will Not Be Precluded by Adoption of LPFM.**

- Digital radio is being engineered to perform in the current FM interference environment. When compared to the current FM interference environment, LPFM will be a minuscule interference source because it will impact a very small percentage of the current listening public, and in very small zones.
- Digital radio advocates' concerns about interference are not based on technical infeasibility, but on the cost of future digital radio receivers. But digital radio manufacturers will be able to make the same cost/performance trade-offs that analog manufacturers have made.
- USADR's engineering submission expresses no concern about third adjacent protection. USADR's concerns relating to second adjacent protection occur *outside* stations' protected contours.
- USADR's technology is robust. USADR intends to transmit duplicative information in both the upper and lower sidebands. If interference temporarily interrupts the upper sideband, the transmission can be reconstructed from the lower sideband and vice versa. IBOC would be threatened by simultaneous first adjacent interference on both sidebands, a highly unlikely scenario.

❖ **Although NPR and NAB argue that reading for the blind services will be harmed, they produce no evidence or data about these services.**