

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

In the Matter of)
)
)
1998 Biennial Regulatory Review --) MM Docket No. 98-93
Streamlining of Radio Technical Rules in)
Parts 73 and 74 of the Commission's Rules)
)
)

REPLY COMMENTS OF KARL D. LAHM, P.E.

1. Karl D. Lahm, a Professional Engineer formerly engaged as a consulting engineer by FM radio broadcast stations (from 1981 to 1992), hereby submits his *personal*¹ reply comments in the above-captioned proceeding. These comments are restricted to Item III(D) of the *Notice of Proposed Rule Making (NPRM)* in this matter and respond to those commenters who support the Commission's proposal on this item.

2. These commenters, such as the Association of Federal Communications Consulting Engineers; duTreil, Lundin & Rackley, Inc.; Hatfield & Dawson Consulting Engineers LLC, Mullaney Engineering; etc. provide little analysis and set forth no particular rationale for their support of the Commission's proposal. This is unfortunate, because that proposal, absent modification, has the potential to continue an artificial, arbitrary, and unfair limitation on the ability of existing Class C stations to offer improved service and force their downgrade to lesser service potential and interference protection. The only avenue for improvement available to these stations under the Commission's proposal, endorsed by these commenters, an increase of antenna HAAT, may not be permissible or practical, especially in the smaller markets.

¹ This writer is presently employed by a Federal foreign affairs agency and offers these comments as a private citizen, independently of his Federal employment.

Background: New Class C Height Above Average Terrain Requirements

3. At &43 of the *NPRM*, the Commission proposes to create a new class of FM stations, Class C0, having a maximum antenna height above average terrain (HAAT) of 450 meters. Noting, at &42, that approximately 60 percent of Class C FM stations operate with antenna HAAT values between 301 and 450 meters, the Commission concludes that the existing FM class structure overprotects these stations and unnecessarily precludes service improvements by stations lower in the FM hierarchy.

4. This writer actively participated in the improvement of Class C FM stations in the wake of the *Report and Order* in Docket 80-90, during the mid-1980s. Many stations sought to increase antenna HAAT above the prescribed class minimum, 301 meters, in order to avoid downgrade to Class C1, but little more. The Commission's comment at &42 indicates that its staff is well aware that most Class C stations did not improve facilities to the class maximum at that time. The inference drawn from the *NPRM* is that these stations have *actively chosen* not to improve their facilities to the maximum prescribed for Class C, 100kW at 600m. While this may be true for some stations, it was not then, and is not now, the case for many.

5. An increase of antenna HAAT above 450m faces many hurdles: airspace obstruction restrictions by the Federal Aviation Administration (FAA), scrutiny of alleged third-order intermodulation interference to poor-quality air navigation receivers by the FAA if any height change whatsoever is proposed, zoning and land-use scrutiny by local governments, supporting structure expense, property boundaries, and real estate expense. In this writer's experience, licensees were willing to improve facilities but were frequently hamstrung by such limitations. Under the Commission's Rules, FM licensees have no alternative to antenna HAAT increase in order to achieve facilities improvements.

Facilities Exceeding ANominal≡ ERP/HAAT Maxima

6. Stations operating with HAAT values in excess of the class maxima of 373.211(b) of the Rules (600m here) must reduce effective radiated power (ERP) as set forth therein in order to maintain service and interference ranges within those which underlie the distance separation table of 373.207. Specifically, such stations must reduce ERP to keep their protected service contour range (1.0 mV/m here) within that set forth in 373.211(b) for their particular station class.

7. Stations operating with lesser HAATs are not permitted to increase ERP so as achieve the service range envisioned for the particular station class. The reason for this is that the potentially interfering contour range would be increased beyond the nominal value presumed in the derivation of the distance separation table of 373.207. An FM station operating with a antenna HAAT of 450 meters would need an ERP of 235kW to duplicate the 92km reference service radius for Class C facilities, but such operation would increase the F(50,10) interference range from 198km to 207km. This is clearly not desirable. But an increase of ERP that would hold *both* the service and potential interference ranges within those embodied by the Commission's distance separation table of 373.207 is, unfortunately, not recognized by the Rules at this time.

Permitting Excess ERP to Overcome Insufficient Antenna HAAT

8. ERP increases at reduced antenna HAAT that would *not* increase interference ranges are certainly feasible and will significantly improve the service of existing Class C stations. The following table illustrates the ERP values permissible for various sub-maximum Class C HAATs while holding the F(50,10) 40dBμ contour to a range of 198 km:

Table I

| <u>Facilities</u> | | <u>Service</u> | | | <u>Interference</u> | | | | |
|-------------------|-------------|----------------|---------------|---------------|---------------------|---------------|---------------|---------------|---------------|
| <u>ERP</u> | <u>HAAT</u> | <u>ERP</u> | <u>70 dBμ</u> | <u>60 dBμ</u> | <u>100 dBμ</u> | <u>80 dBμ</u> | <u>54 dBμ</u> | <u>40 dBμ</u> | <u>34 dBμ</u> |
| <u>(kW)</u> | <u>(m)</u> | <u>(dBk)</u> | <u>(km)</u> | <u>(km)</u> | <u>(km)</u> | <u>(km)</u> | <u>(km)</u> | <u>(km)</u> | <u>(km)</u> |
| 100 | 600 | 20.0 | 68 | 92 | 14 | 50.5 | 137 | 198 | 232 |
| 115 | 550 | 20.6 | 67 | 91 | 13.9 | 50 | 136 | 198 | 232 |
| 135 | 500 | 21.3 | 65 | 90 | 14 | 49 | 135 | 198 | 232 |

| | | | | | | | | | |
|-----|-----|------|----|----|------|------|-----|-----|-----|
| 158 | 450 | 22.0 | 64 | 88 | 13.9 | 47.5 | 132 | 198 | 231 |
| 191 | 400 | 22.8 | 63 | 86 | 13.7 | 46.5 | 130 | 198 | 232 |
| 234 | 350 | 23.7 | 62 | 85 | 13.5 | 45.5 | 127 | 198 | 232 |
| 295 | 300 | 24.7 | 60 | 83 | 13.3 | 44 | 124 | 198 | 233 |

Only at the bottom of the HAAT range shown is there any interference exacerbation whatsoever, with that being *de minimis* for the case of co-channel Class C to Class B relationships.

9. The foregoing concept of permitting ERP increases based upon maintenance of the F(50,10) 40 dBμ contour range at or below that which results for 100kW at 600m would allow significant service area increases by present Class C FM stations. The next table shows the service ranges permitted under the current Rules and the service area increases which would result if ERP increases above 100kW were permitted:

Table II

| <u>Permitted Facilities</u> | | <u>Service Range</u> | | <u>Service Area Increase</u> | |
|-----------------------------|------------------|----------------------|--------------------|------------------------------|---------------|
| <u>HAAT (m)</u> | <u>ERP (dBk)</u> | <u>70 dBμ (km)</u> | <u>60 dBμ (km)</u> | <u>70 dBμ</u> | <u>60 dBμ</u> |
| 600 | 20 | 68 | 92 | 0% | 0% |
| 550 | 20 | 65 | 89 | 6% | 5% |
| 500 | 20 | 62 | 87 | 10% | 7% |
| 450 | 20 | 59 | 83 | 18% | 12% |
| 400 | 20 | 56 | 80 | 27% | 16% |
| 350 | 20 | 53 | 76 | 37% | 25% |
| 300 | 20 | 50 | 72 | 44% | 33% |

The service area gains are particularly significant for the lower HAAT values, which the Commission seems concerned with in the instant *NPRM*. Moreover, such operation would at least meet and potentially exceed the nominal service range of the proposed Class C0 - 83 km.

10. The present restriction of ERP over such a wide range of antenna HAAT values unfairly limits service by present Class C stations. Many face insurmountable airspace obstruction limitations that,

coupled with separation distance requirements, preclude any significant antenna HAAT increase. They would have no choice but a downgrade under the Commission's proposal. But if ERP increases above 100kW were permissible, provided that the interference protection embodied in the distance separation table was not eviscerated, these stations could maintain their present Class C status.

11. Moreover, such improvement would also increase station siting flexibility because of the increase in range to the 3.16mV/m community-of-license service contour. The increased permissible site zone might be enough to relocate to an area where greater airspace obstruction is permissible, multiplying the service improvement that would result. Significant field strength increases would result in areas within the 3.16mV/m contour, presumably within the station's community of license, improving service to workplace listeners, urban commuters, etc.

Conclusion

12. Accordingly, the Commission is urged to consider, as an alternative or adjunct to its proposal, the revision of §73.211 of its Rules to permit ERP values in excess of the class maximum, but constrained to preclude any increase of co-channel interfering contour radius beyond that which would exist for the class-maximum ERP/HAAT combination. If procedural considerations require a Further Notice of Proposed Rule Making to explore this possibility, the Commission is urged to issue that forthwith. Revision of §73.211(b) as suggested herein would permit Class C stations to achieve greater spectrum usage efficiency in the face of FAA airspace, economic, and other limitations on the achievement of class-maximum HAAT values. The Commission's goal of greater efficiency of spectrum usage would be better fostered. Lastly, this option would be particularly attractive to smaller market Class C stations, where there is limited demand for space rental on expensive tall towers and station consolidation has toughened competition.

Respectfully Submitted,

11422 Links Drive
Reston, VA 20190
703-742-8844

/s/ Karl D. Lahm

Karl D. Lahm, P.E.
Virginia Reg. #17958