

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

MM Docket No. 86-144

In the Matter of

Review of Technical Parameters
for FM Allocation Rules of Part 73,
Subpart B, FM Broadcast Stations

FURTHER NOTICE OF PROPOSED RULE MAKING

Adopted: March 1, 1988; Released: March 22, 1988

By the Commission:

INTRODUCTION

1. The Commission herein gives further notice of its proposal in the above-captioned matter to amend Part 73 of its Rules governing the FM Broadcast Service. Specifically, we propose to adjust our domestic intermediate frequency (IF)¹ distance separation requirements² to provide a uniform level of protection from IF interference.³ The current requirements provide different levels of protection depending on the classification of the stations involved. However, there is no technical justification for this disparate treatment. Thus we propose here new requirements that we believe constitute a reasonable standard yet continue to preclude channel allocations and station assignments likely to cause interference. The revised separation distances would also provide for increased flexibility in antenna site selection for most classes of FM stations. Therefore, we believe that the adoption of these requirements would further our objective of promoting efficiency in the allocation, licensing, and use of the electromagnetic spectrum.

BACKGROUND

2. The Commission issued a *Notice of Proposed Rule Making (Notice)*⁴ in this docket in April 1986. In this *Notice*, we proposed to reduce IF distance separation requirements for the additional FM station classes we created in BC Docket 80-90.⁵ Our proposal specified distances for the Docket 80-90 station classes that would provide a level of protection comparable to that provided by the requirements for the existing station classes. Because we are not aware of widespread IF interference problems, we reasoned that the IF distance separation requirements for the existing station classes are adequate in most cases. Also, we invited new test measurements and updated information about the extent of IF interference.

3. The record established thus far (in response to the *Notice*) is inconclusive with regard to the IF distance separation issue, neither clearly supporting nor opposing our proposal. We issued a *Second Report and Order*⁶, in which we concluded that our adoption then of the separation distances proposed in the *Notice* for the new classes

would have been premature. We stated our intention to issue this *Further Notice of Proposed Rule Making (Further Notice)* to develop a more complete and comprehensive record, enabling us to set an appropriate uniform standard for all station classes.

4. Recent tests of commercial FM broadcast receivers by our laboratory indicate that some models are indeed susceptible to IF interference while other models are relatively immune.⁷ Although in some respects the laboratory test conditions may not be fully representative of actual conditions, we nevertheless believe that our methodology for determining the average IF interference susceptibility (within a specified confidence interval) of a sample receiver picked at random from the receiver population is statistically valid.⁸ From the laboratory report, it appears that a minor overall relaxation in the protection level⁹ may be feasible, depending on the trade-off between risk of increased interference and the opportunity for additional broadcast service.¹⁰ However, the laboratory report also indicates that IF distance separation requirements continue to be useful in reducing the probability of IF interference and that a major reduction in the required distances would not be advisable at this time.

PROPOSAL

5. We are proposing to revise minimum IF distance separation requirements as set forth in Section 73.207 of our rules. The proposed distances (*see* Appendix) were calculated to prevent overlap of the predicted 36 mV/m (91 dBu) contours of IF-related stations, regardless of the station classes. This level of protection is equivalent to that provided by the least stringent of our current requirements.¹¹ The proposed distances are either the same as or less than those under the current rule.¹² We are not aware of any significant problems with this protection level in the past, which leads us to believe that no appreciable increase in IF interference would result from the proposed adjustments to these distances.¹³

6. We considered proposing distances based on a lesser protection level¹⁴, in order to provide a measure of relaxation in the requirements for all classes of FM stations. This would offer some increase in flexibility in selecting transmitting sites. Receivers in general would still be protected, although to a lesser degree. However, the measurement data in the record at this time does not conclusively support the choice of one particular protection level over another solely on technical grounds. Therefore, we are proposing distances based on the least restrictive level (*i.e.* 36 mV/m) with which we have long-term experience. We welcome, however, data or test results, particularly from receiver manufacturers or organizations representing receiver manufacturers, which support or oppose on technical grounds, either the 36 mV/m level upon which our proposal is based or an alternative protection level.

7. We are also proposing, as was suggested in the comments, an additional distance separation requirement (comprising distances for each FM station class) for proposed allotments and assignments on FM Channel 253 (98.5 MHz) in the vicinity of an existing TV Channel 6 allotment or assignment, and vice versa.¹⁵ This proposed additional requirement is also based on the 36 mV/m protection level. There are nationwide approximately 65 allotments each of TV Channel 6 and FM Channel 253, but probably only a few instances where the two are geographically close enough to each other to cause IF

interference on FM receivers. Although the same justification exists for this requirement as for the purely FM requirements, we are reluctant to introduce any new regulation in the absence of problems. We request information on any cases where proximity of TV Channel 6 and FM Channel 253 has caused IF interference problems. We also request comment as to whether this additional requirement is necessary.

8. We are not proposing changes to the international IF distance separation requirements in Tables B and C of § 73.207(b). These requirements are contained in the Mexican and Canadian agreements affecting FM stations near the borders.

COMMENT PROCEDURE

9. Under procedures set out in Section 1.415 of the rules and regulations, 47 CFR § 1.415, interested persons may file comments on or before **May 13, 1988**, and reply comments on or before **May 31, 1988**. All relevant and timely comments will be considered by the Commission before final action is taken in this proceeding. In reaching its decision, the Commission may take into consideration information and ideas not contained in the comments, provided that such information or a writing indicating the nature and source of such information is placed in the public file, and provided that the fact of the Commission's reliance on such information is noted in Report and Order.

10. In accordance with the provisions of Section 1.419 of the Rules and Regulations, 47 CFR § 1.419, formal participants shall file an original and 5 copies of their comments and other materials. Participants wishing each Commissioner to have a personal copy of their comments should file an original and 11 copies. Members of the general public who wish to express their comments are given the same consideration, regardless of the number of copies submitted. All documents will be available for public inspection during regular business hours in the Commission's Public Reference Room at its headquarters in Washington, D.C.

EX PARTE CONSIDERATIONS

11. For purposes of this non-restricted notice and comment rule making proceeding, members of the public are advised that *ex parte* presentations are permitted except during the Sunshine Agenda period. See generally Section 1.1206(a). The Sunshine Agenda period is the period of time which commences with the release of a public notice that a matter has been placed on the Sunshine Agenda, and terminates when the Commission (1) releases the text of a decision or order in the matter; (2) issues a public notice stating that the matter has been deleted from the Sunshine Agenda; or (3) issues a public notice stating that the matter has been returned to the staff for further consideration, whichever occurs first. Section 1.1202(f). During the Sunshine Agenda period, no presentations, *ex parte* or otherwise, are permitted unless specifically requested by Commission or staff for the clarification or adduction of evidence or the resolution of issues in the proceeding. Section 1.1203.

12. In general, an *ex parte* presentation is any presentation directed to the merits or outcome of the proceeding made to decision-making personnel which (1) if written, is not served on the parties to the proceeding, or (2), if oral,

is made without advance notice to the parties to the proceeding and without opportunity for them to be present. Section 1.1202(b). Any person who submits a written *ex parte* presentation must provide on the same day it is submitted a copy of same to the Commission's Secretary for inclusion in the public record. Any person who makes an oral *ex parte* presentation that presents data or arguments not already reflected in that person's previously-filed written comments, memoranda, or filings in the proceeding must provide on the day of the oral presentation a memorandum to the Secretary (with a copy to the commissioner or staff member involved) which summarizes the data and arguments. Each *ex parte* presentation described above must state on its face that the Secretary has been served, and must also state by docket number the proceeding to which it relates. Section 1.1206.

OTHER MATTERS

13. We have determined that Section 605(b) of the Regulatory Flexibility Act of 1980 (Pub. L. 96-354) does not apply to this rule making proceeding because if promulgated, it will not have a significant economic impact on a substantial number of small entities. The Secretary shall cause a copy of this Notice to be sent to the Chief Counsel for Advocacy of the Small Business Administration in accordance with Section 603(a) of the Regulatory Flexibility Act (Pub. L. 96-354, 94 Stat.1164, 50 U.S.C. § 602 *et seq.*)(1962).

14. The proposal contained herein has been analyzed with respect to the Paperwork Reduction Act of 1980 and found to contain no new or modified form, information collection and/or record keeping, labeling, disclosure, or record retention requirements; and will not increase or decrease burden hours imposed on the public.

15. IT IS PROPOSED, pursuant to authority contained in Sections 4(i) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154 and 303, That Part 73 of the Commission's Rules be AMENDED as set forth in the Appendix below.

FEDERAL COMMUNICATIONS COMMISSION

H. Walker Feaster, III.
Acting Secretary

APPENDIX

It is proposed to amend 47 CFR Part 73 as follows:

1. The authority citation for Part 73 would continue to read as follows:

Authority: 47 U.S.C. 154 and 303.

2. 47 CFR 73.207 would be amended by revising TABLE A in paragraph (b)(1), and by adding a new paragraph (c). In TABLE A, the first three columns, entitled "Co-channel", "200 kHz", and "400/600 kHz" would remain unchanged. The fourth column, entitled "10.6/10.8 MHz", would be revised to read as follows:

§ 73. 207 Minimum distance separation between stations.

(b) * * *

(1) * * *

TABLE A - MINIMUM DISTANCE SEPARATION REQUIREMENTS IN KILOMETERS (MILES)

Relation	10.8 MHz
A to A	8 (5)
A to B1	11 (6)
A to B	14 (9)
A to C2	14 (9)
A to C1	21 (13)
A to C	28 (17)
B1 to B1	14 (9)
B1 to B	17 (11)
B1 to C2	17 (11)
B1 to C1	24 (15)
B1 to C	31 (19)
B to B	20 (12)
B to C2	20 (12)
B to C1	27 (17)
B to C	35 (22)
C2 to C2	20 (12)
C2 to C1	27 (17)
C2 to C	35 (22)
C1 to C1	34 (21)
C1 to C	41 (25)
C to C	48 (30)

Co-channel 200kHz 400/600 kHz

(no changes to these columns)

(c) The distances listed below apply only to allotments and assignments on Channel 253 (98.5 MHz), after , 1988. The Commission will not accept petitions to amend the Table of Allotments, applications for new stations, or applications to change the channel or location of existing assignments where the following minimum distances (between transmitter sites, in kilometers) from any TV Channel 6 allotment or assignment are not met:

MINIMUM DISTANCE SEPARATION FROM TV CHANNEL 6 (82-88 MHz)

FM Class	TV Zone I	TV Zones II & III
A	16	20
B1	19	23
B	22	26
C2	22	26
C1	29	33
C	36	41

3. 47 CFR 73.610 would be amended by adding a new paragraph (f) to read as follows:

§ 73. 610 Minimum distance separations between stations.

(f) The distances listed below apply only to allotments and assignments on Channel 6 (82-88 MHz), after , 1988. The Commission will not accept petitions to amend the Table of Allotments, applications for new stations, or applications to change the channel or location of existing assignments where the following minimum distances (between transmitter sites, in kilometers) from any FM Channel 253 allotment or assignment are not met:

MINIMUM DISTANCE SEPARATION FROM FM CHANNEL 253 (98.5 MHz)

FM Class	TV Zone I	TV Zones II & III
A	16	20
B1	19	23
B	22	26
C2	22	26
C1	29	33
C	36	41

FOOTNOTES

¹ Intermediate frequency (IF) is a term that refers to the center frequency in a small range of frequencies that are used internally in a receiver for amplification and filtering. Virtually all consumer FM broadcast receivers use 10.7 MHz as their IF.

² IF distance separation requirements are the minimum distances, by station class, that each FM broadcast transmitting antenna must be spaced from the transmitting antennas of other stations that are IF-related, that is, stations that operate on frequencies 53 or 54 channels removed (10.6 or 10.8 MHz above or below the specified station).

³ IF interference occurs when a susceptible receiver encounters two relatively strong IF-related signals. It causes degradation of FM reception, somewhat independent of the setting of the receiver's tuner. Thus, when it occurs, IF interference can prevent clear reception by the affected receiver of many FM stations in the area.

⁴ 51 Fed. Reg. 15927, published April 29, 1986.

⁵ Report and Order in FCC 83-259, 94 FCC 2d 152 (1983); recon., granted in part and denied in part, 97 FCC 2d 279 (1984). The Commission amended the FM broadcasting rules to accommodate more stations by increasing the number of station classes.

⁶ 52 Fed. Reg. 37786, published October 9, 1987. The Commission did not address the matter of IF distance separation requirements in the *First Report and Order*, 52 Fed. Reg. 8259, published March 17, 1987. In that order, the Commission amended the rules to permit any class of station to be allotted on 20 channels previously restricted to Class A operation only. Also, the Commission declined to remove a rule that provides for the classification of stations by zone based on transmitter location rather than the location of the community of license.

⁷ The test procedure was as follows: The sensitivity of each receiver was measured using a standard method, and two reference quieting levels were selected (30 dB and 50 dB). Automated test equipment then supplied a desired and two IF-related undesired signals directly to the antenna terminals of the receiver under test. The desired signal was increased until a quieting level 6 dB greater than the reference quieting level was achieved. Then the two undesired signals were increased until the quieting level was degraded by 6 dB (and thus returned to the reference quieting level). The strength of the undesired signals causing this degradation was then automatically recorded by the testing computer. Details on the test sample, procedures, and results are available in "Laboratory Test Results of the FM-IF Interference in Broadcast Receivers, Project: EEB-86-8", OET Technical Memorandum, FCC/OET TM87-4, June 1987, prepared by J. Ray Hallman. This report will be placed in the docket file in this proceeding, and may subsequently be obtained from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161, or from the Commission's copy contractor, International Transcription Services, Inc., 2100 "M" St. N Suite 140 Wash. D.C. 20037 857-3800.

⁸ An explanation of the statistical method used to extrapolate the sample data to the larger population of FM broadcast receivers is included in the laboratory report as Appendix A. Receivers were classified into several categories to generate a representative test sample and a standard equation for projecting the average performance of a representative sample into a larger population was employed to produce lower and upper boundaries of average performance for a specified confidence level.

⁹ The laboratory report considered the interference potential when required separation distances are set to prevent overlap of IF-related 20 mV/m (approximately) contours, as was intended when IF distance separation requirements were originally adopted in 1965, and when such distances are set to prevent overlap of 30 mV/m contours, as was proposed for the Docket 80-90 station classes, in the *Notice*.

¹⁰ The results of the Commission's laboratory tests tend to reinforce those of similar tests conducted by the National Association of Broadcasters (NAB) and summarized in its report "A Review of the FM-IF Taboo in Contemporary FM Broadcast Receivers in Laboratory Tests" (Edward A. Williams, Department of Science and Technology, National Association of Broadcasters, August 10, 1986). In this report, NAB concluded that the wide range of performance "suggests that manufacturers of FM broadcast receivers could give more attention to the design" of FM broadcast receivers, resulting in "less interference susceptibility, better performance, and the elimination or substantial reduction" of the Commission's IF distance separation requirements. However, NAB also stated that the wide performance range requires that the allotment process take into account the more susceptible receivers so that an undue amount of interference is not experienced by large numbers of the listening public. NAB further concluded that the proximity of a Channel 6 TV station to a Channel 253 FM station should be considered for inclusion in the IF distance separation requirements.

¹¹ Currently, the required separation between two IF-related Class A stations and the required separation between two IF-related Class stations prevent the overlap of the predicted 36 mV/m contours. The current distance separation requirements for the other combinations prevent the overlap of weaker contours ranging down to 24 mV/m, resulting in a higher protection level. F(50,50) propagation data is used to calculate predicted contour overlap for IF separations (*see* § 73.333, Figure 1).

¹² The minimum separation distances between two IF-related Class A stations (8 kilometers) and two IF-related Class C stations (48 kilometers) would remain the same. All other distances would be reduced. For examples, the minimum distance between two IF-related Class B stations would be reduced from 24 to 20 kilometers, the minimum distance between a Class A station and an IF-related Class C station would be reduced from 32 to 28 kilometers, and the minimum distance between two IF-related Class B1 stations would be reduced from 24 to 14 kilometers.

¹³ Notwithstanding the Commission's use, in this proceeding, of contour overlap calculations to define protection levels, meeting or exceeding the required separation distances continues to constitute the only measure of compliance with § 73.207. Applicants seeking a waiver of § 73.207 are advised that alleged discrepancies between the separation distances in the rule and the contour overlap calculations presumed to underlie them do not in themselves constitute sufficient grounds for such a waiver. Other factors germane to each individual case, *e. g.* lack of an alternative antenna site, must be considered when such waiver requests are evaluated.

¹⁴ For example, distances calculated to prevent overlap of the predicted 50 mV/m (94 dBu) contours of IF-related stations could have been proposed. This would mean that, in some locations, IF-related signals could be twice as strong as in our proposal herein. Under such a proposal, all of the minimum separation distances for IF-related stations would be reduced.

¹⁵ The audio transmission from a TV station on Channel 6 (at 87.75 MHz) is IF-related to FM Channel 253 (98.5 MHz). A typical Channel 6 TV aural transmitter can operate with as much as 22 kilowatts effective radiated power with an antenna height above average terrain of 300 meters (TV Zone I) or 600 meters (TV Zones II and III). This is roughly equivalent to a Class C1 FM station.