Channel Assignment
FM Stations, Class A, B, C
Frequency Assignment
Station Separation
Table of Assignments

Final rule making order adopted to permit the operation of an increased number of FM broadcast stations. Rule changes were needed to meet the demand for FM broadcast service that could not be satisfied under the present rules. New rules allow Class A stations to operate on all channels, authorize three new classes of stations, and reclassify existing stations, after a period of three years, according to their operating facilities.
–FM Broadcast Stations
BC Docket No. 80–90

FCC 83–259

BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C. 20554

In the Matter of	
Modification of FM Broadcast Station Rules to Increase the Availability of Commercial FM Broadcast Assignments.	BC Docket No. 80–90 RM-2587 RM-3226 RM-3367

REPORT AND ORDER
(PROCEEDING TERMINATED)

(Adopted: May 26, 1983; Released: June 14, 1983)

BY THE COMMISSION: COMMISSIONER QUELLO DISSENTING AND ISSUING A STATEMENT; COMMISSIONER FOGARTY NOT PARTICIPATING; COMMISSIONER RIVERA ISSUING A SEPARATE STATEMENT; COMMISSIONER SHARP ABSENT.

INTRODUCTION

1. The Commission's *Notice of Proposed Rule Making* ("*Notice*") in this proceeding suggested a number of rule changes to increase the availability of FM stations within the present assignment structure.[1]

[1] 78 FCC 2d 1235; 45 Fed. Reg. 17602; adopted February 28, 1980.

2. The FM band extends from 88–108 MHz and is divided into 100 channels numbered from 201 to 300. The lower 4 MHz contains Channels 201 to 220 and is reserved for noncommercial educational stations. The upper 80 channels between 92 MHz and 108 MHz may be used by both commercial and noncommercial stations. The use of these channels is governed by the FM Table of Assignments ("Table") found in Section 73.202(b) of the Commission's Rules. It provides a listing of communities in which stations are operating, or may operate, and the channel on which they must transmit.

3. When a new station is desired, the Table must be amended through a rule making proceeding to add the requested community and channel. The proposed station must be located a sufficient distance from pertinent co-channel and adjacent channel stations and still be capable of providing a strong signal over the desired community. The distance separation requirements are based upon the assumption that each station is currently, or at some future time will be, operating with maximum facilities (effective radiated power, "ERP," and antenna height above average terrain, "HAAT"). Thus, the Table permits stations to begin operating with less than maximum facilities and to increase them as their financial situations improve.

4. The Commission authorizes three classes of FM stations. Class A stations operate only on 20 designated channels and have a service radius of 15 miles. The service radius is determined from the co-channel distance separation requirements, which provide protection from interference to approximately the station's 1 mV/m contour. Class B or C stations operate on the remaining 60 channels. Whether a station is designated Class B or Class C depends upon its geographic location. Class B stations are assigned in the more densely populated parts of the nation and have a service radius of 40 miles, representing protection of their 0.5 mV/m contour. Areas where Class B stations may be located are designated Zones I and I-A. Class C stations are assigned elsewhere (Zone II) and have a service radius of 57 miles, representing protection of their 1 mV/m contour.

5. The *Notice* recognized that under the present allotment rules, additional service cannot be offered to many parts of the nation where demand has not been satisfied. Commission studies identified three existing standards that appeared to limit new FM service:

(a) Class A stations may operate only on 20 designated channels, thereby foreclosing substantial areas from using the 60 Class B/C channels for these smaller stations;

(b) the distance separation requirements assume stations are operating with maximum permissible facilities, although 80% of the Class C stations and 35% of all FM stations were not operating with maximum, or near maximum, facilities at the time the *Notice* was adopted; and

(c) the Class B separations, which reflect protection of the 0.5 mV/m field strength

contour rather than the 1 mV/m contour, prohibit many communities from obtaining additional FM allotments.

6. Based on these findings, the Commission proposed to respond to the continuing demand for FM assignments by:

(a) allowing stations with Class A facilities to operate on the 60 Class B/C channels if a Class A channel was not available;

(b) increasing the number of classes allowed from three to five by adding Class B1 (operating facilities between Classes A and B) and Class C1 (operating facilities between Classes B and C) stations, so protection would more closely approximate service area;

(c) permitting Class B stations to operate in the same areas as Class C stations (Zone II);

(d) adopting a new distance separation table based on providing uniform protection to the 1 mV/m (60 dBu) contour of all stations (the primary impact of the adoption of this proposal would be on Class B stations whose separations are now based on the 0.5 mV/m contour);

(e) requiring existing Class B and Class C stations operating with less than maximum, or near maximum, facilities to reach the minimum power and antenna height specified for the new classification system within three years, or be reclassified based on their actual operating facilities; and

(f) allowing *new* Class C stations six years to reach their minimum power and antenna height requirements because they would be the only class of station to have a minimum antenna height requirement.[2]

7. Central to the *Notice's* proposals was the retention of the basic Table of Assignments framework. It did not propose to modify the allotment structure represented by the Table. Instead, the Commission sought to focus on those changes that could achieve immediate benefits and to defer consideration of more complex proposals until a later date. These included such matters as terrain shielding, directional antennas, etc.

8. Those parties that submitted comments and reply comments that relate directly to our discussions are listed in Appendix A.* Seven months after the close of the reply comment period, the National Radio Systems Committee ("NRSC") submitted new FM receiver measurement data.[3] On August 3, 1982, the Commission reopened the record to accept the NRSC report and two others filed by

[2] The Commission also proposed to adopt the International System of Units (commonly termed the metric system) for the FM broadcast service because it was considering modifying many of the technical rules.

[3] The National Radio Systems Committee is co-sponsored by the EIA and the NAB and "is comprised of persons from the broadcasting and electronics manufacturing industries and others interested in improving the overall technical quality of radio broadcasting and reception. The NRSC by its charter does not assume a position of advocacy on any matter before the Federal Communications Commission or any other governmental body. One function, however, is to provide agencies with information on transmitting and receiving technology which may be used in rulemaking proceedings."

[Committee description taken from the comments of the NRSC; October 16, 1981.]

the Advisory Committee on Radio Broadcasting ("Advisory Committee").[4] In addition to accepting the reports, the Commission allowed 30 days for other parties to comment on these late-filed studies.[5]

9. Subsequently, the Advisory Committee submitted additional reports and again requested that the Commission re-open the record to accept them and to request comments on their findings.[6] The Commission declined the Committee's request stating that it would consider the reports to be *ex parte* comments submitted under the guidelines governing non-restricted proceedings. Thus, the Commission could consider these reports in its deliberations and any other comments submitted in response to the filing of the reports could also be considered to be *ex parte* comments.

Summary of Actions Taken

10. The Commission has reviewed each of the comments filed. Based on that review, we have decided to amend the rules in the following manner:

(a) Class A stations will be allowed on Class B/C channels;

(b) the distance separation requirements will *not* be modified for existing station classes to reflect uniform protection to the 1.0 mV/m contour (thus, separations for Class B stations in Zones I and I-A still will be based on the 0.5 mV/m contour rather than the 1.0 mV/m proposed);

(c) one new class of station, Class B1, with an expected service range of 45 kilometers (28 miles), will be allowed to operate in Zones I and I-A;

(d) two new classes of stations, Classes C1 and C2, with expected service ranges of

[4] The Commission acted in response to a petition from the Advisory Committee. This committee evolved from the "Advisory Committee on AM Broadcasting in Region 2." The latter committee was established to advise the staff of the Commission during its preparation for, and participation in, the International Telecommunications Union Regional Administrative Conference on AM Broadcasting in the Western Hemisphere. The purview of the AM conference committee was expanded to include FM broadcast issues when its charter was amended on September 10, 1980. It was renamed the "Advisory Committee on Radio Broadcasting" and its organization was altered to specify two subgroups within the committee. One subgroup was to address technical matters while the other concentrated on spectrum allocation matters. [See the *Memorandum Opinion and Order* issued by the Commission on September 22, 1980 (FCC 80-537).]

[5] The studies are entitled: (1) *Report to the National Radio Systems Committee from the FM Subcommittee Task Force*, July 24, 1981 ("NRSC Report"); (2) *FM Broadcasting Receiver Characteristics and Protection Criteria*, July 7, 1982, ("Technical Subgroup Report"); and (3) *Report on FM Allocation Policies*, July 9, 1982 ("Allocations Subgroup Report").

[6] The studies submitted by the Advisory Committee are entitled: *Subjective Evaluations of Audio Degraded by Noise and Undesired FM Signals* ("Subjective Audio Study"), November 17, 1982; *A Study of FM Station Mileage Separations* ("Mileage Separations Study"), November 17, 1982; *Potential Effects of BC Docket No. 80-90 on FM SCA Operations* ("SCA Study"), November, 1982; and *A Study of Stereo Radio Listening* ("Stereo Listening Study"), December 7, 1982.

72 kilometers (45 miles) and 52 kilometers (32 miles), respectively, will be allowed to operate in Zone II;

(e) existing stations will be required to meet minimum facility requirements within three years or be reclassified to a station class based on the new classifications. For Class C stations, a minimum antenna height requirement of 300 meters (984 feet) HAAT will be adopted;

(f) new Class C stations will be required immediately to meet minimum facilities rather than being provided six years within which to comply; and

(g) the rules contained in the FM service will be converted to the International (metric) System of Units.

These amendments are intended to provide for additional FM stations in many parts of the country and still permit existing stations to provide service equivalent to that embodied in the present allotment rules. They represent, in our best judgment, the optimum rule changes necessary to allow new stations while preserving the unique qualities of the FM service.

ANALYSIS OF THE RECORD

11. Our analysis of the record in this proceeding first will set forth those comments that relate generally to the legal and policy issues presented in the *Notice*. After a summary and discussion of those comments, we will proceed to a recitation and analysis of those comments that addressed general technical issues. Then the record on each specific proposal set forth in the *Notice* will be summarized and discussed. Finally, we will discuss various matters that are ancillary to the adoption of the changes set forth in paragraph 10, *supra*, including the implementation of those changes.

Legal and Policy Matters

12. A number of parties argued that sufficient information was not available, nor sufficient thought given, for the proposals in the *Notice* to be satisfactorily considered. ABC, NAB, and other parties urged the Commission to develop a master plan for an integrated AM and FM aural broadcast service before seriously considering any deviations from the existing service structures. They claimed the current approach of instituting separate proceedings for each service represented a conviction to create new radio outlets without regard to public service costs. Cox and Multimedia supplied detailed historical perspectives of the development of the FM service. Noting FM's complementary nature to the AM service, they argued that the suggested modifications be considered in an omnibus proceeding.

13. ABC also argued that the instant proceeding is an ineffective mechanism for dealing with important issues such as demand, economic viability, appropriate service area size, assignment priorities, and viable alternatives. The Advisory Committee urged the Commission to make more extensive economic studies of FM stations

before taking final action. Its reports to the Commission, along with comments submitted by NBC and ABC, cited economic losses and small profit margins as indications that further competition would be undesirable in many situations. PAB and NRBA claimed that additional outlets in marginally profitable markets would result in less local news and public affairs programming. ABC pointed out that, according to several court decisions, the Commission is expected to assess the merits of adding new broadcast stations by balancing public service gains against losses.

14. Some parties argued that demand by potential broadcasters does not represent a public interest determination as required by the Communications Act. Still others claimed that adoption of the proposals in the *Notice* would violate Section 307(b) of the Communications Act, which requires a "fair, efficient and equitable distribution of radio services." They suggested that these factors only can be fully examined if the Commission issues a Notice of Inquiry into these subjects before proposing specifics in a Notice of Proposed Rule Making.

15. NBC contended that the current FM service is efficient and diverse. Quoting from the Spring 1980 Arbitron data, it stated that of the top 100 markets containing 71% of the population over 12 years of age, 88 markets contain 5 or more FM stations; and of the top 150 markets containing 77% of the population over 12 years of age, 123 markets contain 5 or more FM stations. A study performed by A.D. Ring & Associates ("A.D. Ring") was submitted to support the proposition that the proposals would not increase availability in larger markets. The study investigated potential FM stations under the proposed changes for 24 of the top 100 markets. It indicated that no additional FM stations were possible in any of the top 12 markets and only one was found in the top 15 markets. Of the 9 remaining markets studied (markets 16 to 96 at ten market intervals), it indicated that the proposed changes would result in no Class C or C1 stations, 4 Class B stations to 3 communities, 19 Class B1 stations to 7 communities, or 34 Class A stations to all 9 communities.[7] Because no additions would be possible in the highest demand markets (*i.e.*, the top 12), several parties claimed that the proposed changes served no useful purpose.

16. After reviewing the comments submitted in this proceeding, we believe that no more appropriate forum exists within which to comprehensively examine the public interest need for additional FM radio service and the rule changes necessary to bring it about. Every effort has been made to establish as complete a record as possible and to encourage widespread public and industry involvement. We expanded the purview of the Advisory Committee to include the FM

[7] Presumably, some combination of Classes A, B1, and B stations is possible in most of the communities. However, this is unclear from the data submitted.

service, extensively delayed this proceeding by extending the comment period several times, and even accepted late-filed comments. The Commission believes the record before us is adequate to explore all pertinent issues. All matters addressed by the commenting parties (including those studies concerning new receiver characteristics, average distance separations, and audio listener tests and surveys) have been fully examined and factored into our decision. The need for additional outlets and the rule changes necessary to accommodate them have been carefully weighed against the effects such changes would have on the present FM service. We have concluded that the public interest is best served by adopting most of the rule changes proposed. There exists no reason to investigate further the desirability of modifying the rules, as many parties suggested, because such an investigation would only re-confirm what the record before us already indicates and would needlessly delay the benefits of additional FM station availability. Moreover, as subsequent discussion indicates, we have been keenly aware of the interrelationships of the AM and FM services in satisfying our statutory mandate to

> make such distributions of licenses, frequencies, hours of operation, and power among the several States and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same.[8]

17. When assigning radio broadcast stations, the Commission's basic objectives have been to provide

- at least one service to everyone,
- diversified service to as many persons as possible, and
- outlets for local expression addressing each community's needs and interests.[9]

We recognize that these goals can be self-contradictory; therefore it is necessary to strike compromises that both foster service to all and provide for outlets for local expression in as many communities as possible. Such compromises have been struck in the past, resulting in radio service in the United States to 98% of the population with at least one primary fulltime aural service (*i.e.*, one primary nighttime AM or one FM signal of 1 mV/m field strength or greater). *Further Notice of Proposed Rule Making*, Docket No. 20642, at paragraph 53. The rule changes adopted herein will foster the same goals,

[8] Section 307(b) of the Communications Act of 1934, as amended; 47 U.S.C. §307(b).

[9] The Commission recently simplified its FM allotment priorities and reaffirmed these goals for this broadcast service. New FM channels are to be allotted: first, where they will provide a first fulltime aural service; second, where they will provide a second fulltime aural service or a first local service; and third, where they are necessary to meet other public interest matters. (See the *Report and Order* in BC Docket No. 80–130, reconsideration pending, adopted on May 20, 1982.) Those comments seeking a re-examination of the FM priorities have been satisfied by Commission action in BC Docket No. 80–130.

providing opportunities for new local outlets while preserving existing primary service areas.

18. Some of the comments stated that demand for assignments does not represent the necessary Commission finding that such assignments are "in the public interest." Demand, however, does represent an applicant's judgement of a community's interest in and potential financial backing for a new station. We regard this as a fair basis on which to examine the public interest aspects of new proposals. As a practical matter, if a community really has little potential for establishing an additional station, we believe it unlikely that applicants or investors would be willing to extend the effort or financial backing that is required. As a second matter, potential competition should not be curtailed by the Commission second guessing a market's potential. Other comments claimed that increased competition could result in disservice to the public by reducing existing programming services. Our experience is that the public generally benefits from program diversity brought about by increased competition. In an individual situation, however, based on an application and appropriate pleadings, the Commission may be called upon to evaluate the overall adverse impact on service that could result from the institution of a new service in a community. See, *e.g.*, *Carroll Broadcasting v. FCC*, 258 F.2d 440 (D.C. Cir. 1958).

19. We also believe there is ample evidence to support the need for more FM stations. The Station Requirement List, submitted to the Region 2 Conference on AM Broadcasting, represents approximately 3,000 separate locations where the Commission foresaw a potential need or demand for nearly 4,000 additional radio stations in the immediate future.[10] The importance of the list for this

[10] The Commission notified this list to the International Frequency Registration Board (IFRB) to insure international protection of our future radio needs. The list of potential station requirements for various countries in the Western Hemisphere was submitted to the Second Session of the Administrative Conference on AM Broadcasting in Region 2 held in November and December, 1981, to establish future planning needs. Although time did not allow adoption of all these requirements, provisions were made for adding them after the conference. (See *List of Requirements Concerning Stations to be Authorized between 1 January 1983 and 31 December 1987*; Appendix to Document No. 19-E, 16 October 1981.)

This inventory of potential interest or demand for additional fulltime radio stations was compiled from lists of:

a) locations of all daytime-only AM stations;

b) cities asserted as needing minority-owned or public radio stations as defined by National Black Media Coalition and National Public Radio in the *Report on New Station Demand and Viability* as submitted by the Advisory Committee on December 17, 1980;

c) a few places where declarations of interest were filed in response to BC Docket No. 79-164 (the 9 kHz proceeding); and

proceeding is not the specific communities noted but the magnitude of the communities identified as being underserved. More than half of these assignments are in communities with no local AM or FM assignments, no local nighttime service, or are for additional minority-owned or local public radio stations. The Commission's studies have shown that additional AM stations possible as a result of our clear channel actions could only satisfy about 125 of these needs.

20. The A.D. Ring study on the availability of new allotments assumed that demand for new assignments exists only in the larger communities already having assignments. Nowhere in the *Notice* did we imply that the top 100 markets (sampled by A.D. Ring) represent the most serious cases of need. In this regard, the Commission undertook an extensive computer analysis of 200 entries from the Station Requirements List that had no local radio outlets, contained only daytime AM stations, or were asserted as needing additional minority-owned or public radio stations. Our study found that the existing FM allotment rules would allow a total of 57 new stations at 15 of 200 locations studied (see Table I of Appendix B). In other words, 7% of the locations studied could have at least one new FM outlet under the existing rules. For the various proposals under consideration, the studies indicated that the availability of at least one new outlet per location ranged from 41% to 61% of the study locations depending on which modifications are adopted. Thus, the potential of each of the Commission's individual proposals to satisfy the need for additional FM stations can readily be seen.[11]

21. To determine if these results were indicative of availability at a larger number of communities, the Commission conducted another examination using 1000 entries. This study indicated that our earlier findings were conservative. It also showed that under the rules being adopted, additions could be made to approximately: 49% of the communities studied that have daytime AM stations only; 31% of the communities studied that have no local assignments; 40% of the communities studied that were asserted as requiring additional minority-owned stations; and 26% of the communities studied that were asserted as requiring additional public radio

d) communities of at least 2,500 persons which have no local AM or FM assignments and are located more than 10 miles from cities of at least 25,000 persons (compiled by the staff).

The Commission has made extensive use of this list for international negotiations as well as to evaluate AM service availability for the 9 kHz proceeding.

[11] For convenience, a summary of the studies and number of additions possible for each alternative is listed in Appendix B. Further explanation of these studies, their definition and limitations, can be found in a report entitled "Computer Project for BC Docket No. 80–90 (Increased FM Availability)", May 13, 1982, that has been placed in the docket file.

assignments that cannot be accommodated in the reserved portion of the FM band (82-92 MHz).[12]

22. Other indications of unsatisfied demand for additional FM service may be found in the comments of more than 35 parties who supported the proposals in this proceeding. Although the *Notice* specifically requested that commenters not submit requests for new FM allotments, approximately half indicated that additional FM stations needed in their communities were not available without the changes proposed. We also note that we receive approximately 200 petitions annually to amend the FM Table of Assignments, and that approximately 60% of the new assignments have two or more competing applications submitted.

23. In sum, we are persuaded that there exists a substantial demand for new FM service that cannot be satisfied under existing rules. We are persuaded further that the rule changes adopted herein provide the most efficacious means of accommodating that demand.

Technical Matters

24. Technical oppositions to the proposals in the *Notice* generally alleged that few stations operate with maximum facilities at minimum spacing. Therefore, stations are covering larger areas with a higher quality service than would be expected under the present rules.

25. The proposals contained in the *Notice* were, with one exception, based on the same technical assumptions as the allotment and assignment rules adopted in 1963. These rules consider interference protection to be determined solely by the separation, power, and antenna height limitations. They do not recognize concepts such as protected and interfering contours for individual stations. The distance separations provide protection from co-channel and first adjacent channel interference within a "primary" service range.[13]

[12] The difference in availability between the existing rules and the modifications adopted herein is shown in * Appendix B, Figures 1 and 2. These figures show the approximate distribution of additions for 1000 study locations throughout the contiguous United States. Every asterisk or star on Figure 1 indicates an approximate location (with respect to referenced communities) where an additional FM station may be added under the existing rules. Figure 2 indicates the possible station locations under the new rules adopted today, assuming all existing stations elect to increase facilities to avoid being reclassified.

[13] When originally adopted in 1963, the minimum separations were based on the existing FM propagation curves. These curves are not expected to predict service or interference at any particular location at any one time. However, they are useful for predicting service on a large area basis and therefore are used to analyze general assignment questions. Thus, the predicted service area of a class of station is indicated by the propagation curves for the generalized situation and may, or may not, reflect the actual service provided by a given station. For this reason, the rules state that the only protection to which a station is entitled is

At that time, the Commission decided that service ranges of 15 miles for Class A stations, 40 miles for Class B stations, and 65 miles for Class C stations would provide reasonably adequate service areas while permitting a sufficient number of FM assignments to be made.[14] Assuming that stations operate with maximum facilities, the minimum co-channel separations yielded protection of the 0.927 mV/m contour for Class A, 0.562 mV/m for Class B, and 0.944 mV/m for Class C stations. The *Notice* proposed separations that would have protected the 1.0 mV/m contour for all classes of stations; in other words it retained the approximate service areas of the Class A and Class C stations but reduced it for Class B stations.

26. In response, the comments claimed service far beyond these contours and noted that the present FM allotment rules result in an interference-limited service. That is, the predicted *interference-free* service areas are generally greater than those anticipated by the minimum separation requirements because few, if any, stations are limited in every direction by co-channel and adjacent channel stations operating with maximum facilities at minimum spacings. Several parties claimed that a signal at the 0.05 mV/m (34 dBu) level may be received. ABC noted that calculations provided by A.D. Ring indicated that a field strength of 0.063 mV/m (36 dBu) will permit satisfactory stereophonic service (in the absence of interference) while good monophonic reception is possible with a field strength of only 0.0056 mV/m (15 dBu). Still other parties noted that the CCIR, the International Radio Consultative Committee, recommends .25 mV/m (48 dBu) for general planning purposes.

27. Metromedia, Cox, Multimedia, and NBC submitted detailed showings of what they considered the interference-free service contours of their stations. ABC stated that an examination of their 7 owned and operated stations revealed that their existing interference-free service areas were greater than the area recognized by the minimum distance requirements. Metromedia submitted studies claiming the interference-free service offered by three of its stations would be reduced by 28, 37, and 43% of their geographic service areas if the proposals suggested in the *Notice* were adopted. Similar NBC studies indicated population losses for its stations of between 4.8 and 33% if their interference-free service areas were restricted by the proposals. It further noted that those losing service would not have it replaced by the new stations. NBC claimed that locations between 33 and 60 miles from New York City would lose most, if not

that provided by the distance separation requirements, not the predicted service area indicated by the propagation curves (see Section 73.209 of the Rules). We are not changing this concept in this proceeding.

[14] The propagation curves in use in 1963 predicted a 65 mile service range for Class C stations. Those curves were refined in 1975 (53 FCC 2d 855), and the new curves indicate that the 180 mile co-channel separation figure yields a 57 mile service range as indicated at paragraph 4, *supra*.

all, of the New York City service. Thus, it concluded, the suburban and rural populations surrounding the larger cities would suffer the greatest losses. Cox and Multimedia also claimed that the only practical way of serving many suburban areas is with wide-area metropolitan stations.

28. Another A.D. Ring study submitted by ABC claimed a net loss in service would result from the Commission's proposals. It contained several theoretical assignment situations where new stations were interjected into certain currently permitted station groupings. All additions resulted in a net loss of service area.[15] It claimed this proved that any increases in FM availability would be to the detriment of present listening audiences.

29. NTIA, in reply, argued that stations should only be protected to "a primary service area" and service beyond that limit is properly considered secondary or unprotected. It also argued that the A.D. Ring study did not consider several factors, including the use of directional receiving antennas in rural areas (which would reduce the level of the interfering signal), the capture effect of FM receivers to distinguish the desired signal from the weaker undesired co-channel signal (which would reduce the large areas of degraded audio quality)[16], and the population densities in the interference zone (which should be much smaller than those near new community outlets).

30. Upon review of these comments, we note that the Commission recognized in 1963 that certain amounts of potential interference-free service had to be discounted if a sufficient number of assignments were to be made. Thus, we adopted mileage separations which struck a balance between the size of a station's contemplated service area and the number of stations that could be authorized throughout the country. Our experience since then has indicated that the balance was not incorrectly determined. From 1,100 commercial FM stations in 1963, we now have 3,800, and the demand for new FM stations is evident by the number of new channel

[15] The evaluations indicated a net loss in service area of:

(a) 2,075 square miles if a Class B station were located at the center of 4 Class B stations located at the four corners of a square 170 miles on a side;

(b) 563 square miles if a Class B1 station were located at the center of 4 Class B stations located at the four corners of a square 153 miles on a side;

(c) 1,695 square miles if a Class B station were located at the tip of a triangle 120 miles from 2 Class B stations that are 170 miles from each other; and,

(d) 2,649 square miles if a Class B1 station were located at the tip of a triangle 108 miles from 2 Class B stations that are 153 miles from each other.

[16] Reception of one of two co-channel FM signals of nearly equal strengths is possible because FM receivers are capable of responding to the stronger of the two signals. AM receivers provide mixed reception in these cases.

allotments requested every year and the instances of competing applications for available channels.

31. We recognize that the introduction of new stations into the current scheme could cause interference to the reception of existing stations beyond their normally contemplated service areas. Indeed, this is the case under present rules where the Commission regularly receives letters complaining of lost FM service (outside the primary service area) when a new station is activated or an existing station modifies its facilties. Proposed rule changes that would permit additional new stations would similarly create losses of secondary services. The opponents of the rule changes, however, have failed to provide any information that the populations allegedly losing such extended services exceed the population gains from new stations.[17] We believe that these losses are more than compensated for by the provision of new services, particularly to communities without local service. In this regard, we note that 98% of the population of the United States currently receives at least one fulltime primary aural service. The new stations contemplated herein would not adversely affect that primary service, but they would provide local service (or local fulltime service) to communities that are precluded under current rules. In this manner, the percentage of the population enjoying primary aural service and the number of communities with local stations may be increased. On balance, therefore, we believe that the provision of new primary service and first and/or second local service is a higher priority than the preservation of service beyond the normally protected service area of existing stations. This is particularly the case where that extended service may be adversely affected under current rules if: the providing station changes its location; a limiting station is authorized under current distance separation requirements; or an existing limiting station changes or increases its facilities within current restrictions. Accordingly, we do not believe it appropriate to protect these extended service areas at the expense of new primary service.

32. Some commenters also alleged that the present minimum separation requirements result in a low quality signal at the outer edge of a station's primary service range. They noted that while the original protection ratios are satisfactory for regular FM broadcast operations, they are unable to protect multiplexed operations

[17] The previously referenced theoretical A. D. Ring study is limited to *areas* of alleged loss of service only. It, therefore, could not provide information on the population within those areas, the population that would receive primary service from the presumed new station, or the other services available in the asserted "loss" area. The interference-free service areas that Cox and Multimedia claimed for their stations, however, each contain between 17 and 34 FM stations located either within or directly along the claimed service contours of each station. Between 7 and 14 of these locally assigned FM stations are located within the areas they claim will lose service (except for Station WAIA, Miami, Florida, where the interference-free service is mostly over swamp land).

(stereophonic broadcasting and subsidiary communications operations). The comments urged sufficient protection of the service contour to permit "satisfactory" reception of these operations at the full extent of their service range.

33. In support of this argument, these comments called attention to the international standard for stereophonic reception which is based on a 50 dB audio frequency ("AF") signal to noise ("S/N") ratio. (The international standard is contained in the recommendations of the CCIR.) To provide for this level of quality, they argued that the distance separation requirements should be increased to provide higher radio frequency ("RF") desired to undesired ("D/U") signal protection ratios.[18] The Technical Subgroup Report summarized several recent studies and submitted curves indicating the effect of various distance separations on co-channel protection ratios for a desired 1 mV/m (60 dBu) signal.[19] This report and several comments noted that the NRSC Report concluded that reception of a signal yielding a 50 dB AF S/N ratio in the stereophonic mode requires RF D/U protection ratios of 40 dB for co-channel, 25 dB for first adjacent channel, and -20 dB for second adjacent channel stations.

34. Also, Group W alleged that FM subcarrier services could not be provided effectively if stations operated at minimum separation distances. They stated that any modifications which would decrease current protection could significantly reduce the quality of subcarrier services. The SCA Study, submitted by the Advisory Committee, echoed this argument and noted that further investigations should be performed.

35. Although the Commission was aware of the fact that some FM stations were providing stereo service in 1963 when it first addressed this issue in Docket No. 14185, and that such service required greater protection for high quality reception, it did not select separations to protect stereo service to the limit of the

[18] The Advisory Committee, urging protection of stereophonic service, submitted three studies dealing with this topic: the Stereo Listening Study; the Subjective Audio Study; and the Mileage Separations Study. These studies indicated that (1) approximately one-half of all radio receivers are capable of stereophonic reception, with stereophonic listening about twice as common as monophonic listening; (2) a 50 dB AF S/N ratio was necessary for satisfactory stereophonic reception (if the presence of the interfering signal was to be only "slightly annoying" according to a panel of expert listerners); and (3) the average co-channel separation between stations yields a 34 to 40 dB RF D/U signal protection ratio.

[19] The reports concerning protection standards are: *Report to the National Radio Systems Committee from the FM Subcommittee Task Force*, July 24, 1981; *Report of the National Quadraphonic Radio Committee to the Federal Communications Commission*, November 1975; *Recommendations and Reports of the CCIR*, 1978; and *A Study into Current FM Receiver Performance and the Relevance of FM Allocation Criteria*, Peter Cahn and Associates, April 1978.

otherwise contemplated service radius. The requests to increase protection ratios were rejected based on the need to provide for a sufficient number of necessary assignments and because stereophonic broadcasts were considered to be an optional enhancement of a station's entertainment programming.

36. Nonetheless, the Commission re-examined the desirability of requiring such protection in response to the comments received in this proceeding. We used the NRSC receiver data to determine the expected service ranges under the present rules for monophonic and stereophonic reception of signals having different qualities. A 30 dB AF S/N ratio was used to represent the "standard quality" monophonic service now provided by the separation requirements. (This figure generally is assumed to form the basis for present protection ratios although, in Docket No. 14185, the Commission did not acknowledge it as such.) A 50 dB AF S/N ratio was used to represent the "high quality" stereophonic service referenced by the comments. We developed the following table based on a receiver having the performance characteristics obtained by averaging the data contained in the NRSC report (assuming co-channel stations operating at minimum distance separations with maximum facilities):

Type of Reception	*AF S/N Ratios*	*RF D/U Ratios*	*Predicted Primary Service Area (miles)*		
			Class A	*Class B*	*Class C*
mono	30 dB	14 dB	19.4	47.5	63.5
stereo	30	*20	16.6	41.5	57.1
mono	50	35	7.9	27.1	41.3
stereo	50	40	6.2	22.6	36.1

*RF D/U ratio used to determine present co-channel separation distances.

Thus, the present co-channel Class C separation requirement of 180 miles permits "standard quality" monophonic reception at a distance of approximately 63 miles while "high quality" stereophonic reception is expected to a range of 36 miles. All minimum separations provide for an "inner ring" of high quality stereophonic service which gradually diminishes to standard quality monophonic service at the limit of the primary service range in the direction of the undesired station.

37. To provide stations with the 40 dB RF D/U protection necessary to achieve a 50 dB AF S/N ratio, however, would require the separation between co-channel Class C stations to be increased from 180 miles to 255 miles. Such an increase amounts to a Class C station's signal experiencing 20 dB RF D/U protection at a distance of 82 miles from the transmitter rather than 57 miles as currently expected. In other words, protection that results in 50 dB AF S/N stereophonic service simply extends a station's monophonic service range. If the new distance separations were the only ones based on the higher protection levels, the new station classes would require distances as great, or almost as great, as the present requirements

for the larger classes. For example, for a new Class C1 station to offer a minimal 34 dB RF protection level, it would have to be located at least 217 miles from an existing co-channel Class C station (while a new Class C would only have to be separated from an existing Class C station by 180 miles). Analysis of the adjacent channels yields analogous results.

38. To require protection at such levels would effectively preclude many new assignments. Even if this proceeding were broad enough to determine a minumum level for predicted stereo service, we do not believe that protection of that service beyond what was contemplated in 1963 would be appropriate. As we found 20 years ago, such protection would significantly increase the necessary separation between relevant channels and thereby substantially decrease the potential for new stations. We believe that the balance as originally struck provides adequate service areas to potentially support a station's operation while giving opportunities to create enough stations to provide a fair, equitable, and efficient distribution of radio service among the several States and communities. See 47 USC 307(b) (1936)

39. We recognize that permitting Class A stations on Class B/C channels and the intermediate classes of stations provide additional opportunities for the creation of stations that may have a limiting effect on the stereo service areas enjoyed by existing stations by virtue of their location at distances exceeding the minimums established in the rules. However, we believe that the potential gains of new service, consistent with the mandate of Section 307(b), far outweigh the losses of enhanced (stereophonic) service predicted by the commenting parties since protection was not afforded the affected areas under the existing rules. In making this judgment, we emphasize that such areas will continue to get the same protection for monaural service as was originally comtemplated in 1963. That is to say, the balance is between new service and enhanced (stereophonic) service, and we find no compelling reason to increase previously granted protections at the expense of needed new service to communities that would otherwise be precluded from getting a new FM service.

40. In this regard, we again emphasize that the communities we have identified as potential locations for new FM assignments under these rules include a substantial percentage of places with no local service or with only daytime AM service where existing rules would not permit a new FM station. We believe that provision of such service outweighs a predicted loss of multiplex services that may already be severely curtailed by existing co- and adjacent channel stations.

41. The requests to increase the protection ratios on which the separations are based are directly related to the arguments concerning service beyond the theoretical protected contour. Parties have

argued that we should protect a station's stereophonic service to what had been the limit of its normally contemplated service radius. They assert that most stations are located at more than the minimum mileage required by our rules and such stations therefore receive stereophonic protection beyond what could be expected at the minimum distance. We do not doubt that this is the case. Our mileage requirements are *minimums* and have never been waived at the allotment stage. Moreover, persons seeking new FM stations desire to serve specific communities. That fact along with the minimum mileage requirement would result in a location at some greater distance in almost all cases. If the service areas were determined solely by the distance to co-channel stations, there would be many cases where an FM station provided monaural and stereophonic service to a significantly larger area than that contemplated by the co-channel separation figures. However, in many cases, limiting stations are those on adjacent channels.[20]

42. Finding that a station's predicted stereo service area is limited by co-channel and adjacent channel stations does not mean that stereo service is unavailable in these areas or that the "losses" are irreversible. In fact, the new receiver data contained in the NRSC report indicates that the 20 dB RF D/U ratio provides for stereophonic reception, if possibly of lesser quality than some parties believe appropriate, and not just monophonic reception as previously thought by the Commission and many parties. Several parties used present protection ratios to claim that their service is being listened to and *enjoyed* at the outer edge of their interference-free contours. Therefore, the arguments suggesting that the signal quality at the present protection level is "unlistenable" appear highly exaggerated. Even the listening tests and surveys indicated only that a 30 dB AF S/N ratio was "annoying" for the "preferred" stereophonic reception mode. As an alternative to higher protection ratios, persons receiving service of inferior quality may easily improve it by installing a directional receiving antenna or improving the performance capability of their receiver. In this manner, persons residing in areas predicted to "lose" service may regain it if they so desire.

43. Several parties also stated that the Commission should protect a station's service range from second and third adjacent channel interference, rather than basing these separations on substitution of signals.[21] Finally, many parties asserted that mobile

[20] For example, the stereo service area of station WPGC, Morningside, Maryland is limited by a single co-channel station (WJAC-FM, Johnstown, Pennsylvania) and three adjacent channel stations (WFLO-FM, Farmville, Virginia; WFTR-FM, Front Royal, Virginia; and WFLN-FM, Philadelphia, Pennsylvania).

[21] Replacement service assumes that the service of one station will supplant, not simply interfere with, the service of another station. Using this concept, new stations must locate outside the predicted service area of stations 2 or 3 channels removed, and these stations must be outside the service area of the new station.

(*i.e.*, automobile radio) reception problems would be exacerbated if the distance separations set forth in the *Notice* were adopted.

44. ABES and ABC both argued that the second and third adjacent channel separation requirements should recognize the same service area as the co-channel and first adjacent channel separation standards. Not doing so is a direct cause of mobile FM receivers randomly capturing undesired stations. ABES also claimed that tuning in the "educational band" (where the primary service range is given full second and third adjacent channel protection) is comparatively easy versus tuning in the "commercial band" (where the replacement service concept permits closer spacing of stations). It claimed that this difference illustrates the appropriateness of protecting the primary service contour rather than using the replacement service concept. As an example of tuning difficulties, ABES noted mobile reception problems in the Washington-Baltimore area where 56 stations are assigned in the "commercial" portion of the FM band. ABES recommended that *full* protection from second and third adjacent channel interference be afforded to each station's primary service range. ABC and AGK suggested that a compromise "guardband" solution be adopted if full second and third adjacent channel protection standards were unacceptable. Their guardband compromise was to base the distance separation requirements on a -40 dB RF D/U ratio for both second and third adjacent channel separations.[22]

45. NTIA, on the other hand, found only minor interference problems with seven Los Angeles area FM stations that have second and third adjacent operations at less than minimum separations. The data did not address whether the public is experiencing reception problems, except to note that "several station managers knew of no interference problems." NAB, in reply, claimed that the resulting minor interference areas would not be typical because the receiver data referenced more expensive receivers than the average ones used by the public.

46. We recognize that some environments cause FM receivers, particularly mobile receivers, difficulty in maintaining suitable signal strengths to avoid second and third adjacent channel interference. Mobile receivers were not a major planning factor in the present separation requirements or those proposed in the *Notice*. Rather, we used the concept of replacement service. Mobile receivers, however, are subjected to wide variations in signal strength due to multipath reflections as they pass through different environments along highways. In these situations, they are likely to "lock onto" stronger adjacent channel signals rather than the desired signal. The Commission believes that the separation distances can be

[22] This is the third adjacent channel protection standard required in the educational portion of the FM band (88–92 MHz). See Section 73.509 of the Rules.

modified to reduce mobile reception problems and only minimally affect the potential for additional FM stations. Thus, the rules we are adopting provide "guardband" protection on second and third adjacent channels as suggested by ABC and AGK.[23]

47. Finally, several parties urged consideration of additional FM stations on a case-by-case basis, including consideration of directional antennas and terrain.[24] Cox/Multimedia, however, argued that a protected contour scheme risks engulfing the FM service with the interference and processing problems of the AM broadcast service. In any case, the Commission is not convinced that the benefits of the Table (*i.e.*, ease of comparing community needs, provision for future facility growth, and simplicity of processing procedures) should be abandoned at the present time. Even with the changes adopted herein, many, if not most, existing stations will be provided the opportunity for future growth. Although some parties indicated a preference for the "AM-type" method, this method is too time-consuming to comport with the Commission's goals to facilitate faster processing procedures. The changes adopted herein should provide the opportunity to establish additional radio stations in areas of greatest demand that should not be delayed by case-by-case processing procedures. A go/no-go method as represented by minimum distance requirements still is advantageous and preferred.

Specific proposals

48. Before turning to a discussion of each proposed change, it may be helpful to reiterate the results of the Commission's computer studies on the potential benefits of those changes. Using 200 locations identified as needing additional radio services, the studies determined how many of these could have an allotment under the existing rules and each proposed rule change separately. The resulting progression demonstrates the incremental increase in availability, *i.e.*, the percentage of locations for which at least one new allotment was found, for the individual proposals. (The benefits of each option are set forth in more detail in the individual discussion of each proposed change and in Appendix B.)

[23] Also, the NRSC Report indicated that the second adjacent channel interfering signal can be 50 dB greater than the desired signal (-50 dB RF D/U) and still provide a 30 dB AF S/N stereophonic output signal. Thus, the -40 dB RF D/U ratio appears generous for distance separation requirements based on a monophonic reception standard.

[24] Although the use of directional antennas, terrain shielding, and co-location of transmitters were not proposed in this proceeding, the Commission did request additional information. We sought guidance on how these methods might be incorporated into our present Table structure. A variety of information on increasing FM availability and the potential problems of employing these techniques were submitted. Specific suggestions related to preservation of the Table were not provided.

Options	*Availability*
1. Existing rules	7%
2. Class A stations on Class B/C channels	41%
3. Class B stations in Zone II	41%
4. Additional station classes B1, C2, and C1	43%
5. Uniform protected contour	55%
6. Reclassification (with Option 5)	61%
(without Option 5)	57%

49. *Option 2, Class A Stations on Class B/C Channels.* This proposal was opposed by ABC, NBC, and others who suggested that, although it could result in new assignments in areas outside the larger radio markets (*i.e.*, outside the top 12 markets), this service would represent an inefficient use of channels reserved for the wider area stations.[25] NTIA, on the other hand, suggested that reserving certain channels for Class A use should be eliminated altogether. They argued that any class of station should be allowed to operate on any channel. NAB, in reply comments, argued that this idea would be contrary to the basic principle of the Table which ensures stations for smaller sized markets.

50. Several parties claimed, and our studies confirmed, that this proposal would provide the single largest increase in availability for most locations. Our study of 200 locations found that availability of at least one new station per location would increase from 7% under the present rules to 41% if this proposal were adopted. Many argued that these outlets would be a new source of interference outside the primary service range of existing stations. As stated previously, however, the Commission believes that the opportunity to establish additional stations should not be curtailed by providing protection to secondary service areas. Therefore, we will allow Class A stations to operate on all channels.

51. NTIA also proposed that Class B and Class C stations be allowed to operate on Class A channels. However, that change should offer few potential assignments, and those that are possible would preclude large areas from future Class A allotments. Therefore, at this time we will allow Class A operations on any channel, but other station classes will not be permitted to operate on the Class A channels.

52. The *Notice* further suggested that Class A stations be permitted to occupy a Class B/C channel only if a Class A channel were not available. No specific comments addressed this proposed restriction. The Commission, however, is concerned that defining

[25] These parties also argued that adoption of this proposal would result in some Class A stations operating at a competitive disadvantage to higher power stations. This issue was addressed in BC Docket No. 80–130. The Commission found there that intermixture of different classes of stations within the same community should not be foreclosed as a matter of general policy. In any case, the issue now before us is not whether different classes of stations may be intermixed in the same market but whether Class A stations should occupy Class B/C channels.

availability (*i.e.*, reasonable site, city grade coverage, co-location with AM transmitter, antenna farms, etc.) would be difficult. Therefore, we have decided not to adopt this restriction because it would require extensive showings and would be administratively cumbersome to enforce. We believe the applicant to be the best judge of its particular situation and accordingly shall not restrict its choice. Likewise, we will not require these channels to be used by the larger class of station first, as some parties urged. To do so might be counterproductive to the establishment of a local station if a potential applicant lacked the financial resources to construct and operate the larger class of station.

53. *Options 3 and 4, Intermediate Classes of Stations.* The *Notice* proposed creating two new classes of stations: Class B1 with facilities between Classes A and B and Class C1 with facilities between Classes B and C. It also suggested allowing Class B stations to operate nationwide. Thus, three classes of stations (Classes A, B1, and B) would be permitted in Zones I and I-A and all five classes (Classes A, B1, B, C1, and C) in Zone II.

54. Most comments did not focus on allowing Class B stations in Zone II independently of the other proposals. As pointed out in the *Notice*, simply allowing Class B stations to operate in Zone II would not allow many additional assignments unless the distance separations were changed.[26] [The FCC computer studies confirmed that no increase in availability was possible (Option 3 compared to Option 2) and only 12 of the Class A stations from Option 2 could become Class B stations (see Table II of Appendix B).] Consequently, the *Notice* proposed to reduce the protected contour of all Class B stations from 0.5 mV/m to 1.0 mV/m.

55. As for the creation of the proposed Class B1 and Class C1 stations, ABC claimed that the A.D. Ring studies proved they would not be beneficial to the public. It noted that no Class C1 stations could be identified and the Class B1 stations that were found would cause interference to existing services over geographic areas that would exceed the gains from the new services. ABES noted that additional classes of stations could be supported if variations of the *Notice's* proposals that would provide adequate protection to existing stations were adopted. Specific modifications were not suggested, however, except to urge protection of existing *interference-free* service areas. NTIA again urged an even greater number of station classes. It argued that the distribution of service areas for existing Class B and Class C stations would be more uniform if seven rather than five classes were adopted. In reply, Cox/Multimedia claimed that NTIA's proposal for seven classes does not contain any detailed

[26] This occurs because the existing rules require Class B stations to be separated from co-channel Class C stations by 170 miles, or only 10 miles less than the co-channel Class C to C requirement of 180 miles.

technical analysis but merely an assumption that "if five classes of channels are efficient, seven would be even more efficient." They argued that NTIA failed to address the effects of tighter constraints on station growth, licensee costs, greater levels of predictable interference, and administrative impact.

56. Although NTIA's seven class proposal may represent more uniform statistical distribution of existing stations, this is a benefit of little value and great cost. An analysis of its proposal indicated only slight differences between co-channel separation requirements for different classes of stations. For example, NTIA's Class C1 station would be separated from a Class C station by 160 miles, while a Class B station would be separated from the same Class C station by only 156 miles, a difference of only 4 miles. These separations would not allow stations sufficient room for facility growth or adequate transmitter site selection. It also would be administratively cumbersome for the Commission to oversee. While we believe additional station classes are desirable, a balance must be reached between complexity and the numbers of potential assignments. Therefore, we shall not adopt the classes proposed by NTIA.

57. The Commission explored the gains possible if stations with Class B facilities were assigned in Zone II and protected to the proposed 1 mV/m contour (*i.e.*, denoted as Class C2).[27] We also explored the proposal to create additional classes of stations so that existing stations would receive protection more in keeping with the service rendered. The FCC computer studies examined the number of assignments possible if three new classes (B1, C2, C1) of stations were added. Thus, separate classes were studied for the two zones: Classes A, B1, and B in Zones I and I-A and Classes A, C2, C1 and C in Zone II. These studies assumed protection of existing stations equal to that embodied in the present separation requirements. This option found that availability would only be 43%, compared to the 41% expected by permitting Class A stations to operate on Class B/C channels (Option 4 versus Option 2). However, the study also indicated that the stations assigned could operate with greater facilities. An additional 11 Class B1, 46 Class C2, and 16 Class C1 stations were found (see Table II of Appendix B).

58. Because the larger class of station represents improved efficiency in terms of service-rendered compared to interference-caused, the Commission is convinced that adopting these additional classes of stations would be beneficial.[28] We believe that allowing

[27] Since the Class B minimum separation requirements depend upon the zone of operation, stations operating with Class B facilities in Zone II will be termed Class C2 to avoid confusion with Class B facilities in Zone I.

[28] Efficiency according to Docket No. 14185 is defined as: Eff. $= 363 \times (R/S)^2$, where R is the primary service radius of a station and S is the spacing between stations (see *Notice of Inquiry, Notice of Proposed Rule Making, and Memorandum*

stations with Class B facilities with modified separation requirements in Zone II (Class C2) and creating intermediate classes of stations (Classes B1 and C1) that serve larger areas than Class A stations represent major benefits in terms of spectrum efficiency.

59. *Option 5, Uniform Protected Contour (1 mV/m).* Several parties submitted detailed showings indicating that changing the minimum separation requirements to represent a uniform 1 mV/m protected service contour could severely limit a station's primary service range, especially that of Class B stations. Metromedia and various other parties pointed out that there were specific reasons for Class B stations currently being based on a 40 mile service range. They noted that, in 1963, the Commission found that the large metropolitan communities of the northeast averaged 33 to 40 miles in radius. They argued, therefore, that a minimum limit of 33 miles for Class B stations was totally unacceptable for many communities located in Zone I. ABES stated that such a reduction would be a 32% loss in primary service area for Class B stations and, in one particular case, a loss in population of 175,000 persons for each station located at Indianapolis, Indiana.

60. ABC and others argued that a 1 mV/m protected contour was previously considered and rejected in 1963 in Docket No. 14185. They noted than the Commission refused to create a squeezed-in service by "protecting only the 1 mV/m contour." Cox submitted that reducing the minimum spacing would create a system similar to the AM service and would waste FM's unique potential for wide-area service. ABC claimed that this proposal would not represent any appreciable increase in new FM assignments because only one addition in the A.D. Ring study was due to reduced separation requirements. Because the other proposals yielded greater numbers of potential FM additions, it argued that the uniform protection proposal would not be instrumental in providing for additional FM assignments in needy areas. NTIA in reply claimed that both Class A and Class C stations "have done well" with a 1 mV/m protected contour and suggested that Class B stations "should be able to also." They argued that a decrease in separations would allow new stations at intermediate distances.

61. ABES focused on the impact of the protection of mobile receivers and submitted detailed analyses of several situations in the northeast where several stations are spaced less than the minimum separation requirements. It claimed that the resulting protection of only the 1 mV/m contour in these cases has made matters so severe as to render many signals "unlistenable." Consequently, reducing the minimum separation requirements would result in similar areas where only garbled signals could be received. Because more cities

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Opinion and Order at paragraph 39). Thus, the efficiency of co-channel Class C1 stations is 32%, while co-channel Class A stations are only 19% efficient.

have acquired "New York City-like" architecture that causes increased signal reflection and diffraction since the present distance separations were developed, it suggested the Commission avoid any action that would increase interference to these receivers. ABES stated that in today's environment (*i.e.*, tree-lined highways, bridge abutments, super-highway signs, downtown buildings, etc.), "[t]he desired signal is subject to very rapid changes in level, beyond the ability of the receiver signal "leveling" or automatic volume control to avoid." It further cited cases in New York City, Philadelphia, and along the U. S. Route 1 corridor where co-channel and first adjacent channel stations located at less than minimum spacings have resulted in many cases of "limited coverage within myriads of interference." Thus, ABES argued that greater protection is needed and the distance separations should not be decreased.

62. The Commission recognized in the *Notice* that this proposal would have a substantial impact on the primary service area of existing Class B stations. Because the present separation requirements for Class A and Class C stations afford protection to approximately the 1 mV/m contour (at .912 and 1.023 mV/m, respectively, using current propagation curves), they are, for the most part, unaffected by the proposed change. For the Class B station, however, this proposal would reflect a change from the .524 mV/m to the 1.0 mV/m field strength contours or a decrease in primary service range from 40 miles to 33 miles. The *Notice*, however, questioned whether the increases in availability justified reducing the Class B stations' primary service area. The majority of the commenting parties, citing the A.D. Ring study statistic of only 1 addition, argued the negative. The FCC computer studies, on the other hand, revealed that availability would increase from 43% (Option 4) to 55% with this proposal. Thus, 110 of the 200 study locations would be provided an opportunity for additional outlets instead of 86 (see Table I of Appendix B). Also, the number of stations allowed at these communities would increase from 235 to 332. This new availability, unlike the other proposals under consideration, would be at the expense of the primary service areas of existing stations. In view of this impact and because urbanized areas have grown since 1963, the argument against this proposal is most compelling. The Commission does not consider the incremental increase in availability to justify the loss of existing primary service areas. Again, balancing the total number of potential stations against the potential service rendered, we cannot justify reducing a station's expected service area at this time.[29]

63. *Option 6, Reclassification of Existing Stations.* The *Notice*

[29] As noted in comments submitted by Bob Zwick, the Commission is aware that the 1 mV/m contour may be located at a distance of 40 miles by allowing an increase in facilities for Class B stations. However, this suggestion would not foster the goal of increasing the availability of FM stations.

further proposed to reclassify all existing stations, after a period of three years, according to their actual operating facilities. The Commission noted that many existing stations are operating substantially below the maximum facilities permitted. Because the minimum separation requirements assume maximum facilities, these stations preclude other FM stations from being authorized, yet do not furnish primary service over the area intended. The three year period was suggested to give each station the opportunity to explore its ability to increase facilities and submit an application for modification of its license.

64. NBC suggested that reclassification of stations where the need for mutual protection could be demonstrated should not occur. They argued that if existing stations chose to operate below minimum facilities, the new assignment "should protect all existing service areas." Metromedia did not technically oppose reclassification stating that ". . . it was a more reasonable approach than reduced distance requirements of providing increased service to the less populated areas in the West." Cox and several others, however, opposed this change, stating that part of FM's unique identity, which allows for future expansion, could be destroyed. They argued that existing licensees would be faced with an unappealing choice. They either would have to risk present economic investment to increase their facilities based on estimates of future community growth, or otherwise be foreclosed from realizing their full potential due to present circumstances. ABES and others noted that stations may not be operating with maximum facilities due not only to economic reasons, but for other reasons as well. They cited the Commission's multiple ownership restrictions (Section 73.240), FAA air hazard limitations, and local zoning restrictions as examples. Because many of these limitations restrict antenna heights, ABES suggested that stations be allowed to increase their power to attain the equivalence of operating with maximum effective radiated power (ERP) and antenna height above average terrain (HAAT).

65. The Commission realizes that many stations are operating at less than "full" facilities because of other Commission regulations, other government agencies' limitations, or restrictions of local jurisdictions. It is exactly this inconsistency, between the Commission providing for expansion when the possibility is virtually nonexistent, that we wish to rectify. Rather than viewing reclassification as discriminatory, the Commission believes that recognizing actual facility limitations is a realistic means of allowing for additional outlets. In fact, we view the preclusion of new stations from relatively underserved communities by stations operating substantially below maximum facilities as being the real case of discrimination. Additional FCC computer studies verified that availability of new FM stations could increase from 43% to 57% if reclassification were considered (see Table III of Appendix B). Because a station's

classification should reflect its potential, either by spacing requirements, economics, or government limitations, the Commission views reclassification as desirable.

66. The ABES' suggestion that stations unable to increase their antenna height be allowed to increase power to attain equivalence of a station operating at the maximum facilities was considered in Docket 14185 and rejected. The Commission stated ". . . an increase in power increases interference more than it does service. Therefore, we should obviously encourage improvement in service through greater antenna height rather than greater power, and affording an opportunity for power increase, without limit or at least to a greater extent, would work in the other direction." [*First Report and Order* at para. 79] Because this argument is true today, we must again reject this alternative.

67. *Time Permitted to Upgrade Facilities.* The *Notice* suggested that existing stations would be given three years to improve their facilities to the minimum for their class, before any reclassification took place. It further proposed that new Class C stations have a period of six years within which to reach minimum facilities before being reclassified. Since these two proposals consistently were confused, an explanation appears in order. The first period of 3 years would apply to *all existing* licenses, construction permits, or applications that were authorized, or on file, on the effective date of this order. Thus, one announced date would be used for evaluating the facilities of existing stations. The later proposal would continually be permitted when *future Class C* applications were authorized. Because the Class C stations would be the only class with a minimum antenna height requirement, this time would provide new Class C stations with an initial opportunity to obtain revenue before possibly constructing a large antenna tower.

68. The comments failed to provide any specific data that would support a deadline either longer or shorter than those proposed in the *Notice*. ABC argued that three years may be inadequate for licensees to reach any minimum operating requirements. They suggested that the Commission authorize liberal extensions of any deadlines. NTIA fully supported reclassification and submitted 24 months (2 years) as a more than adequate time for expansion. However, the reply comments of Cox/Multimedia urged that 2 years was an unrealistic time period to allow stations to make an application for a change in facilities. Several parties wished to have an unlimited time in which to effect the changes. Finally, the difference in the time permitted existing and future stations received no comment.

69. Lacking details, it is incumbent upon us to balance the public interest benefits of the new services possible after reclassification against the inconvenience to broadcasters. On balance, we believe that, for simplicity, a single date should apply to all instances. We

cannot allow an open-ended time period continually to frustrate the opportunity to establish the new stations. Nor do we intend to provide time that is inadequate to consider and submit applications for facilities equal to or greater than the minimum for a class of station. In this regard, we emphasize that licensees can protect their classification merely by filing an application to upgrade their facilities. It is not necessary that the application be granted or the construction be completed by the deadline date. Additionally, we expect that any group seriously contemplating a new Class C service station should have good economic support and be able to begin operations with the larger facilities. Specifying a different six year period for each new Class C authorization would create confusion and be administatively difficult to implement.

70. Based on a weighing of the benefits and inconveniences, and considering the delays in reaping the benefits of the other changes adopted herein, we will indicate a date three years from the effective date of this order by which *all* stations must apply for appropriate minimum facilities. After the 3 year time period for expansion has expired, a complete listing of the FM Table of Assignments will be published to indicate the new class designations that reflect the facilities authorized, or those for which an application has been filed.[30]

71. The Commission is also using the opportunity presented by this proceeding to modify its rules governing "major" and "minor" modifications of station authorizations. Currently, any modification that represents a change of 50%, or more, in the area within a station's predicted 1 mV/m field strength contour is considered a major modification of an authorized FM station. Because the distance separation requirements are based on using maximum facilities, we believe the procedure to increase facilities (that will be encouraged by adopting the reclassification proposal) could be greatly simplified. Therefore, we shall designate these changes as minor modifications.

Miscellaneous

72. *Preferences*. Many existing licensees of either Class A or short-spaced stations requested they be given preference in the assignment of any new channels which may become available. NPR and CPB also requested similar preferential treatment be afforded to

[30] The Commission does not consider reclassification as a modification of a station's license. Because the license authorizes only the station's actual facilities, it would not have to be altered in anyway. Reclassification is merely the re-designation of a station's potential status in a geographic table of channel reservations. Even if our action could be construed as a license modification, the record adduced in response to present *Notice* is entirely sufficient to explore licensees' concerns, and they would not be entitled to separate hearings based upon reclassification. See, *WBEN, Inc.* v. *U.S.*, 396 F.2d 601 (2nd Cir. 1968)

educational, noncommercial entities in either the allotment or the assignment process.[31] ABC supported establishing assignment priorities including favoring applicants that seek to convert daytime only AM stations to fulltime local outlets. Several licensees of short-spaced stations submitted detailed examples of how mutual interference problems have curtailed their primary service areas. They also requested preference in the use of any new allotment that could alleviate their present circumstances.

73. The Commission is not convinced that this proceeding is the best vehicle for considering preferences of this type. It has focused on FM allotment matters rather than questions of channel usage by a particular entity or group. We believe these questions are more appropriately considered in separate rule making proceedings focused on licensing policies rather than allotment rules. For example, we note that the outstanding *Notice of Inquiry and Notice of Proposed Rule Making* in BC Docket No. 82–538, has asked for comments on the desirability of providing licensees of daytime-only AM stations a preference for the use of any FM allotments that might become available in their communities. 47 Fed. Reg. 38937 (published September 3, 1982). We believe that preferences for daytime-only AM licensees, existing short-spaced FM licensees and other worthy groups are best resolved in proceedings specifically devoted to such matters.[32]

74. *Puerto Rico.* Portorican American Broadcasting Co. requested special consideration of the problems encountered in Puerto Rico because of terrain. It submitted a detailed explanation of the difficulties experienced trying to improve the facilites of its FM station WOQI, Ponce, Puerto Rico, by changing its transmitter site. It urged the Commission to allow flexibility for existing stations to improve their service before permitting additional outlets on the island.

75. The Commission again is reluctant to consider rule changes for individual situations. Instead, we prefer to account for any specific problems through the present processing methods. In reviewing Portorican's comments, we note that its request involves a waiver to locate at less than minimum spacings to existing FM stations on the island. Further, it urges grant of the waiver using calculations employed in the noncommercial, educational section of the rules (§ 73.509), which is based on protection of existing contours.

[31] NPR specifically requested individual channels be reserved for future use in communities lacking adequate public radio service.

[32] We recognize that many licensees of existing stations, including AM daytime stations, will be interested in seeking the use of the new FM allotments that will be available as a result of this proceeding. In light of this interest, and in recognition of the valuable community service that these licensees have provided, we intend shortly to issue a Notice of Proposed Rule Making proposing procedural means to facilitate such improvements of existing service.

Inequities because of terrain in Puerto Rico were addressed in the *Fourth Report and Order* (Docket No. 14185) adopted in 1964 and again in a recent *Report and Order* (BC Docket No. 81–421). We prefer to continue this pattern and will address any particular problems that are unique to Puerto Rico in separate proceedings when needed.

76. *Aviation.* The Commission also had a request by ARINC and AOPA to recognize potential increases in interference to aeronautical navigation and communication services that are immediately adjacent to the FM broadcast band at 108–136 MHz.[33] AOPA noted that according to its surveys 43 locations currently experience interference and "innumerable" other cases have had to be rectified through reassignment of aeronautical frequencies. Both argued that the proposals set forth in the *Notice*, except for Class A additions, would have an adverse impact on aviation. They and the FAA also expressed concern over the encouragement of tall antenna towers, especially of Class C stations, that intrude into navigable airspace.

77. The problem of potential interference to avionics by FM stations is well known to the Commission. It has been handled satisfactorily in the past via coordination procedures with the FAA, and we are confident that any potential interference problems can continue to be handled effectively. Finally, we note that the minimum requirement for antenna height above average terrain (HAAT) is not a requirement on the antenna tower structure itself. Thus, it is difficult to estimate the problems that could arise due to the Class C minimum HAAT requirement. Antenna tower heights normally are supplied to the FAA at the application stage when individual antenna height above ground is known. This procedure should continue to enable us to sort out any potential problems due to tower heights.

78. *Existing short-spaced stations.* Short-spaced stations are those licensed prior to adoption of the minimum distance separation requirements that failed to meet the new spacings (*Fourth Report and Order* in Docket No. 14185). ABES urged the Commission to correct the defects adopted for consideration of short-spaced stations in Docket No. 14185 (see Section 73.213). They recommended that the short-spaced station rules be amended to accord full protection from second and third adjacent channel interference. They suggest these cases be administered in a manner similar to the educational rules (Section 73.509), where actual signal strengths are used to determine allowable radiation.

79. The *Notice* stated that the rules governing existing short-spaced stations would be examined later if necessary. In the

[33] These parties indicated that interference to aviation services can be caused by intermodulation products of two or more FM broadcast signals or by the combined field strengths from high powered FM stations causing receiver desensitization.

meantime we have determined that short-spaced stations shall continue to be subject to the existing rules. If these stations are reclassified, separation will be based on their previous class of station.

80. *Implementation.* The Commission is aware of the tremendous interest many groups and individuals have in the outcome of this proceeding. Since the *Notice* was adopted, status inquiries have been made on a daily basis. These contacts and our own investigations lead us to believe that a pent-up demand will be unleashed after adoption of the rule changes outlined above. Our goal is to respond to requests for new allotments as quickly as possible and minimize the backlog of mutually exclusive petitions. Proceedings addressing such petitions take considerably longer to resolve and place greater demands on the Commission's legal and technical staff than the routine uncontested proceedings. To facilitate prompt service to the public, we also desire to process applications quickly.

81. Unfortunately, our present staff resources are not adequate to respond in a reasonable time even if our expectation of demand is grossly overstated. Consequently, we will delay the effective date of the new rules until sufficient staff is available to handle the increased workload.[34] When additional resources are made available, the Commission will begin modifying its computer programs to permit the use of the new rules. At the same time, we shall institute a rather large scale rule making to amend the FM Table of Assignments using approximately 500 locations from the "needs" list compiled for the Region 2 Conference on AM broadcasting.

82. That rule making will request the public to indicate interest in the proposed assignments or to propose alternative assignments by the comment date. Only in that manner can the Commission avoid receiving an overwhelmingly large number of petitions on the effective date of the new rules. We believe our course of action is preferable since it allows us to maintain control over the initial proposals and any counter proposals that may be made. Similarly, we shall attempt to avoid the filing of a large number of applications for new allotments which might occur if a single Report and Order were adopted that addressed them *in toto*. Therefore we shall adopt a series of Reports and Orders addressing the proposed allotments in individual groups. In this manner, applications should be effectively metered to correspond to the Commission's staff resources.

83. Upon completion of the omnibus proceeding, other FM petitions for amendment of the Table will be accepted and considered. Before the effective date of the new rules, any petitions or

[34] The Senate Commerce Committee has already recommended an increase in the Commission's FY 1984 budget to specify funds for the processing of FM petitions and applications received because of rule changes made in the instant proceeding. The House Appropriations Committee has also recommended additional FY 1984 funds to increase the staff to respond to the anticipated increased workload.

applications that do not conform to the "old" rules will be returned. The Commission regrets that this unusual procedure is necessary. However, we must be in a position to address petitions and applications upon the effective date of the new rules and no suitable alternative exists given our present resources.

84. *Metrication.* As indicated in the *Notice*, we believe that this would be an appropriate time to convert the FM broadcast service to the International System of Units in order to conform to the Commission's program for conversion of all our rules to metric (see Public Notice, FCC 76–737, July 28, 1976). The Commission believes the conversions should be realistic values of "convenient" metric figures rather than a simple multiplication by the appropriate factor. For example, antenna height maxima will be 100, 150, 300, and 600 meters rather than the 92, 153, 305, and 610 meters proposed.[35] In all cases, the metric term shall be the determining factor in any discrepancies. Also, the rules adopted today will govern any disputes that may arise and will take precedence over any other rule sections which may refer or relate to the changes being made herein.[36] Obviously, all circumstances cannot be anticipated. Therefore, the Commission will offer continuing guidance on this subject as appropriate.

CONCLUSION

85. Since certain modifications can be made without affecting the primary service areas of existing stations and there appear to be many underserved locations, the Commission is persuaded that changes to the FM allotment rules are appropriate. Therefore, we shall: (1) allow Class A stations to operate on all channels, (2) authorize three new classes of stations, and (3) reclassify existing stations, after a period of three years, according to their operating facilities.

86. Although every effort has been made to hold constant the present degree of expected service, a station's existing predicted primary service area may change slightly due to the introduction of new classes of stations, reclassification, or conversion to the International System of Units. Any subsequent additions to the FM Table of

[35] We recognize that some requirements will increase while others will decrease. However, conversion to convenient numbers is preferred notwithstanding any slight modifications that may result. Of course, all stations operating with facilities in excess of the maximums adopted will be permitted to continue operating with their existing facilities.

[36] All factors have been converted to the appropriate decimal place of their metric equivalent. For convenience, some conversion factors are listed below:

meters	=	.3048 x feet
kilometers	=	1.609 x miles
square kilometers	=	.386 x square miles

Assignments resulting in the operation of new stations will be in accordance with the rules established herein, and as such their operation will not constitute a modification of existing licenses under Section 316 of the Communications Act of 1934, as amended. *WBEN, Inc. v. United States*, 396 F. 2d 601 (2nd Cir. 1968). Accordingly, hearings at the time of actual individual changes are not required and are not anticipated. In view of the detailed nature of this proceeding, we are confident that the Mass Media Bureau expeditiously can resolve disputes which may arise as a result of the conversion process. Accordingly, we delegate to the Chief, Mass Media Bureau, such authority.

87. Because the Commission wishes to adopt new classes of stations but reject the uniform protection standard of 1 mV/m (60 dBu), slight adjustments have been made to the proposed facilities of the new classes of stations. Although three additional classes (Class B1, B, and C1) were proposed for Zone II, we believe that the two chosen offer approximately the same variety as the three intended under the uniform protection standard.[37] Therefore, the following is a summary of the classes, maximum facilities, allowed zone, and, for reference only, the approximate co-channel primary service ranges and resultant field strengths:

Station Class	*Maximum Facilities kW & m.(ft.)*	*Permitted Zone*	*Service Radius km.(mi.)*	*Field Strength mV/m (dBu)*
A	3 & 100 (328)	1&2	24 (15)	1.0 (60)
B1	25 & 100 (328)	1	45 (28)	.7 (57)
B	50 & 150 (492)	1	64 (40)	.5 (54)
C2	50 & 150 (492)	2	52 (32)	1.0 (60)
C1	100 & 300 (984)	2	72 (45)	1.0 (60)
C	100 & 600 (1968)	2	92 (57)	1.0 (60)

88. NTIA also suggested that minimum facilities be based on the distance to the 1 mV/m (60 dBu) contour. Although this coverage is an important consideration, the determining factor must be a station's authorized power and minimum antenna heights are, in most cases, unduly restrictive. The Commission continues to believe that the city grade signal requirement is normally the best way to enforce minimum areas of service. Only Class C stations will have a minimum antenna height requirement to exceed the Class C1 maximum of 300 meters (984 feet). Some parties expressed the opinion that this would be a discriminatory policy toward Class C licensees. ABES and others questioned the choice of the minimum

[37] The definition of Class C1 was kept in order to avoid confusion with the Canadian Class C1 that also is allowed 100 kW ERP and 300 meters HAAT. This results in Class C2 denoting a smaller facility station than Class C1. Although the Class C2 would be allowed the same facilities as a Class B station, its service radius would only be 52 kilometers (32 miles) rather than the 64 kilometer (40 mile) range of the Class B.

height requirement for Class C stations and said that simply choosing one-half the existing maximum height was arbitrary. The Commission, however, is convinced from its own records and the data submitted by NTIA that an antenna height of 600 meters (1968 feet) HAAT is an unrealistic expectation for most of the country. While we do not wish to foreclose the possibility of this extended coverage station altogether, the Commission believes that, since 80% of the Class C facilities operate below the Class C1 requirements, recognizing this condition via a minimum antenna height is completely justifiable.

89. On the other hand, we are attempting to better define a station's class based on its operating facilities. Since the station should clearly belong to one class of station, minimum power requirements will be set as proposed. Therefore, the minimum power per class must exceed the maximum of the next lower class for its zone, except for Class A stations which will continue to have a minimum requirement of 100 watts.

90. The Commission also is adopting an amended distance separation table to incorporate the new classes of stations. New separations are inserted for the new class relationships that recognize that interference within the primary service ranges for each class of station does not exceed an undesired to desired ratio of 1:10 (-20dB) for co-channel stations and 1:2 (-6dB) for first-adjacent channel stations. The existing co-channel and first adjacent channel separations are the approximate metric equivalent rounded off to the nearest kilometer. The second and third adjacent channel separations represent either the existing spacings converted to kilometers or the "guardband compromise" of not allowing the undesired signal to exceed the desired signal by 100:1 (40 dBu) within the desired station's primary service range, whichever is greater. Finally, the distances for stations separated by 53 or 54 channels correspond to those of the major station classification as proposed in the *Notice*.

91. Those allotments and assignments which are within 320 kilometers (199 miles) of the Canadian or Mexican border must conform to the requirements specified in the FM Broadcast Agreement existing between the United States and the respective country. Since the present agreements do not acknowledge Class B1, Class C2, and, in the case of Mexico, Class C1 stations, these classes of stations must meet the criteria of the Class B or Class C station classes. Thus, the new distance separation requirements are presented in three separate tables depending upon whether the allotments and assignments to be considered are located in the United States, Canada, or Mexico.

92. According to the definitions adopted at the 1979 World Administrative Radio Conference (WARC) of the International Telecommunications Union, the term "allotment" rather than "assignment" more closely identifies the designation of a frequency

or channel for use in a specific geographic area. Assignment is the authorization of a radio frequency channel for use by an entity under specific conditions. Thus, a channel may be *allotted* to a community or place but *assigned* to a licensee. A plan of potential channel designations should be referred to as Table of Allotments. The rules will be amended to denote the Table as the: Table of FM Allotments.

93. In view of the foregoing, IT IS ORDERED, pursuant to the authority of §§ 4(i), 303(f), (g) and (r) and 307(b) of the Communications Act of 1934, as amended, that the rules are amended as set forth in the attached Appendix C, effective on the date specified in a future public notice issued by the Commission indicating that resources have been made available for implementing the new rules (see paragraphs 80 thru 83, *supra*).

94. IT IS FURTHER ORDERED, That this proceeding IS TERMINATED. For further information on this matter contact Kathryn S. Hosford, Mass Media Bureau, (202) 632-9660.

FEDERAL COMMUNICATIONS COMMISSION
WILLIAM J. TRICARICO, *Secretary*

*Appendices A, B, and Figures 1 and 2 - may be seen in the FCC Dockets Branch.

APPENDIX C

1. Section 73.202 is amended by revising the headnote, paragraph (a) and the heading title of paragraph (b) to read as follows:

§73.202 Table of Allotments.

(a) *General.* The following Table of Allotments contains the channels (other than noncommercial educational Channels 201–220) designated for use in communities in the United States, its territories, and possessions. All listed channels are for Class B stations in Zones I and I-A and for Class C stations in Zone II unless otherwise specifically designated.

(1) Channels designated with an asterisk may only be used by noncommercial educational broadcast stations. Noncommercial educational FM allotments (Channels 201–220) available for use in various communities in Arizona, California, New Mexico, and Texas are listed in §73.504. The rules governing the use of noncommercial educational channels in other communities are contained in §73.501.

(2) Each channel listed in the Table of Allotments reflects the class of station that is authorized, or has an application filed, to use it based on the minimum and maximum facility requirements for each class contained in §73.211.

Note. The provisions of this subparagraph [(a)(2)] become effective [3 years from the effective date of the Report and Order in BC Docket 80–90.].

(b) *Table of FM Allotments.*

* * * * *

2. Section 73.203 is revised in its entirety to read as follows:

§73.203 Availability of channels.

Applications may be filed to construct FM broadcast stations only at the communi-

ties and on the channels contained in the Table of Allotments (§73.202(b)). Applications that fail to comply with this requirement, whether or not accompanied by a petition to amend the Table, will not be accepted for filing. However, applications specifying channels that accord with publicly announced FCC orders changing the Table of Allotments will be accepted for filing even though such applications are tendered before the effective dates of such channel changes.

3. Section 73.204 is revised to read as follows:

§73.204 International agreements and other restrictions on use of channels.

See §§73.207, 73.220, and 73.1650.

4. Section 73.205 is amended by revising the introductory text to read as follows:

§73.205 Zones.

For the purpose of allotments and assignments, the United States is divided into three zones as follows:

5. Section 73.206 is revised in its entirety to read as follows: §73.206 Classes of stations and permissible channels.

(a) The following frequencies are reserved for use by Class A stations:

Frequency (MHz)	*Channel Number*	*Frequency (MHz)*	*Channel Number*
92.1	221	100.1	261
92.7	224	100.9	265
93.5	228	101.7	269
94.3	232	102.3	272
95.3	237	103.1	276
95.9	240	103.9	280
96.7	244	104.9	285
97.7	249	105.5	288
98.3	252	106.3	292
99.3	257	107.1	296

(b) Stations designated as Class A, B1, and B may be authorized in Zones I and I-A. Classes A, C2, C1, and C may be authorized in Zone II. The facilities for each class of station are listed in §73.211. The 20 channels listed in paragraph (a) of this Section may only be used by Class A stations but the other channels may be used by any class of station.

(c) The rules applicable to a particular station, including minimum and maximum facility requirements, are determined by its class. Class designation is based on the zone in which the station's transmitter is located, or proposed to be located.

6. Section 73.207 is amended by revising paragraphs (a) and (b) to read as follows:

§73.207 Minimum distance separation between stations.

(a) FM allotments and assignments must be separated from other allotments and assignments on the same channel and five adjacent channels by certain minimum distances. If transmitter sites do not meet the minimum distances listed in paragraph (b) of this Section, 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. Class D (secondary) assignments, however, are subject only to the separation distances contained in subparagraph (b)(3). (See Section 73.512 for other rules governing the channel and location of Class D (secondary) assignments.)

(b) The distances listed below apply only to allotments and assignments operating on the same channel or one of five critical channels adjacent to the desired channel. The five adjacent channels are the first (200 kHz removed from the main channel), the second (400 kHz removed), the third (600 kHz removed), the fifty-third (10.6 MHz removed), and the fifty-fourth (10.8 MHz removed). The distances shown must be met regardless of which is the proposed station (i.e., distances shown from a new Class A station to an existing Class C station are also the distances between a new Class C station and an existing Class A station).

(1) Allotments and assignments in the United States must be separated from other domestic allotments and assignments by the following minimum distances.

Table A
MINIMUM DISTANCE SEPARATION REQUIREMENTS
in kilometers (miles)

Relation	*Co-channel*	*200 kHz*	*400/600 kHz*	*10.6/10.8 MHz*
A to A	105 (65)	64 (40)	27 (17)	8 (5)
A to B1	138 (86)	89 (55)	48 (30)	8 (5)
A to B	163 (101)	105 (65)	69 (43)	16 (10)
A to C2	163 (101)	103 (64)	55 (34)	32 (20)
A to C1	196 (122)	129 (80)	74 (46)	32 (20)
A to C	222 (138)	169 (105)	105 (65)	32 (20)
B1 to B1	175 (109)	114 (71)	50 (31)	24 (15)
B1 to B	211 (131)	145 (90)	71 (44)	24 (15)
B1 to C2	200 (124)	134 (83)	56 (35)	40 (25)
B1 to C1	233 (145)	161 (100)	77 (48)	40 (25)
B1 to C	259 (161)	193 (120)	97 (60)	40 (25)
B to B	241 (150)	169 (105)	74 (46)	24 (15)
B to C2	237 (147)	164 (102)	74 (46)	40 (25)
B to C1	270 (168)	195 (121)	79 (49)	40 (25)
B to C	274 (170)	217 (135)	105 (65)	40 (25)
C2 to C2	190 (118)	130 (81)	58 (36)	48 (30)
C2 to C1	224 (139)	158 (98)	77 (49)	48 (30)
C2 to C	249 (155)	188 (117)	98 (61)	48 (30)
C1 to C1	245 (152)	177 (110)	82 (51)	48 (30)
C1 to C	270 (168)	209 (130)	101 (63)	48 (30)
C to C	290 (180)	241 (150)	105 (65)	48 (30)

(2) (i) Under the Canada-United States FM Broadcasting Agreement, domestic U.S. allotments and assignments that are located within 320 kilometers (199 miles) of the common border must be separated from Canadian allotments and assignments by the following distances. Class B1 and Class C2 allotments and assignments must be considered Class B allotments and assignments when using this table.

Table B
MINIMUM DISTANCES SEPARATION REQUIREMENTS
in kilometers (miles)

Relation	*Co-channel*	*200 kHz*	*400 kHz*	*600 kHz*
A to A	145 (90)	80 (50)	40 (25)	32 (20)
A to B	217 (135)	137 (85)	72 (45)	64 (40)
A to C1	241 (150)	161 (100)	105 (65)	97 (60)
A to C	241 (150)	193 (120)	121 (75)	113 (70)
B to B	249 (155)	169 (105)	97 (60)	72 (45)
B to C1	274 (170)	201 (125)	121 (75)	97 (60)
B to C	274 (170)	225 (140)	137 (85)	113 (70)
C1 to C1	306 (190)	225 (140)	145 (90)	113 (70)
C1 to C	306 (190)	249 (155)	169 (105)	121 (75)
C to C	306 (190)	257 (160)	169 (105)	129 (80)

(ii) Under the Canada-United States FM Broadcasting Agreement, a short spacing of up to 8 kilometers (5 miles) in the direction of a related station may be considered acceptable depending on the circumstances of each individual case.

(3) Under the Mexican-United States FM Broadcasting Agreement, U.S. allotments and assignments located within 320 kilometers (199 miles) of the common border must be separated from Mexican allotments and assignments by the following distances. Class B1 and Class C2 allotments and assignments must be considered Class B and Class C1 allotments and assignments must be considered Class C when using this table.

Table C
MINIMUM DISTANCE SEPARATION REQUIREMENTS
in kilometers (miles)

Relation	*Co-channel*	*200 kHz*	*400/600 kHz*	*10.6/10.8 MHz*
A to A	105 (65)	65 (40)	25 (15)	8 (5)
A to B	175 (110)	105 (65)	65 (40)	16 (10)
A to C	210 (130)	170 (105)	105 (65)	32 (20)
A to D	95 (60)	50 (30)	25 (15)	8 (5)
B to B	240 (150)	170 (105)	65 (40)	25 (15)
B to C	270 (170)	215 (135)	105 (65)	40 (25)
B to D	170 (105)	95 (60)	65 (40)	16 (10)
C to C	290 (180)	170 (150)	105 (65)	48 (30)
C to D	200 (125)	155 (95)	105 (65)	25 (15)
D to D	18 (11)	10 (6)	5 (3)	3 (2)

* * * * *

7. Section 73.208 is amended by revising paragraphs (a), (b) (2), and (c) to read as follows:

§ 73.208 Reference points and distance computations.

(a) (1) The following reference points must be used to determine distance separation requirements when petitions to amend the Table of Allotments (§ 73.202(b)) are considered:

firstly, transmitter sites if authorized;

secondly, reference coordinates designated by the FCC;

thirdly, coordinates listed in the United States Department of Interior publication entitled *Index to the National Atlas of the United States of America*; or

lastly, coordinates of the main post office.

(The community's reference points for which the petition is submitted will normally be the coordinates listed in the above publication.)

(2) When the distance between communities is calculated using community reference points and it does not meet the minimum separation requirements of § 73.207, the channel may still be allotted if a transmitter site is available that would meet the minimum separation requirements and still permit the proposed station to meet the minimum field strength requirements of § 73.315. A showing indicating the availability of a suitable site should be submitted with the petition. In cases where a station is not authorized in a community or communities and the proposed channel cannot meet the separation requirement a showing should also be made indicating adequate distance between suitable transmitter sites for all communities.

(b) * * *

* * * * *

(2) The coordinates of the other community as listed in the publication listed in paragraph (a) of this Section; or, if not contained therein,

* * * * *

(c) The distance between reference points is considered to be the length of the hypotenuse of a right triangle, one side of which is the difference in latitude of the reference points and the other side the difference in longitude of the two reference points. Distance must be computed by the method given in this paragraph. (This method may be used to accurately determine distances up to 350 kilometers (217 miles)). For these distances, this method will normally be more accurate than calculations using spherical trigonometry that do not correct for the spheriodal shape of the earth. Its accuracy deteriorates rapidly, however, for distances beyond 475 kilometers (295 miles) and it should not be used in those cases.

(1) Convert the latitudes and longitudes to degrees and decimal parts of a degree in accordance with Table I of § 73.698.

(2) Determine the middle latitude of the two reference points to the nearest second of latitude (average the latitudes of the two points).

$$LAT_m = (LAT_1 + LAT_2)/2$$

(3) Determine the number of kilometers per degree of latitude difference for the appropriate middle latitude.

$$LAT_k = 111.108 - .566 \cos(2\ LAT_m)$$

(4) Determine the number of kilometers per degree of longitude difference for the appropriate middle latitude.

$$LONG_k = 111.391 \cos(LAT_m) - .095 \cos(3\ LAT_m)$$

(5) Determine the north-south distance in kilometers.

$$LAT = LAT_k (LAT_1 - LAT_2)$$

(6) Determine the east-west distance in kilometers.

$$LONG = LONG_k (LONG_1 - LONG_2)$$

(7) Determine the distance between the reference points by the square root of the sum of the squares of the distance obtained.

$$DIST = (LAT^2 + LONG^2)^{1/2}$$

where:

LAT_1 & $LONG_1$ = coordinates of one location in decimal degrees.
LAT_2 & $LONG_2$ = coordinates of second location in decimal degrees,
LAT_m = middle latitude between points,
LAT_k = kilometers per degree of latitude difference
$LONG_k$ = kilometers per degree of longitude difference,
LAT = north-south distance in kilometers,
LONG = east-west distance in kilometers, and
DIST = distance between two reference points in kilometers.

In computing the above, sufficient decimal figures must be used to determine the distance to the nearest kilometer.

8. Section 73.209 is amended by revising paragraphs (b) and (c) to read as follows:

§ 73.209 Protection from interference.

* * * * *

(b) The nature and extent of the protection from interference accorded FM broadcast stations operating on Channels 221-300 is limited solely to the protection that results from the distance separation requirements and the rules governing maximum power and antenna heights. These rules are specified in this Sub part.

(c) When the FCC determines that grant of an application would serve the public interest, convenience, and necessity, an antenna location may be specified in a designated antenna farm area that results in separations less than those specified in this Sub part. All FM allotments and assignments must be afforded protection from interference equivalent to the protection afforded under the minimum separations specified in this Sub part.

9. Section 73.211 is revised in its entirety to read as follows:

§ 73.211 Power and antenna height requirements.

(a) *Minimum requirements.* (1) Except as provided in paragraph (b)(2) of this Section, the minimum effective radiated power for:

Class A	stations must equal	0.1 kW	(-10 dBk);
Class B1	stations must exceed	3 kW	(4.8 dBk);
Class B	stations must exceed	25 kW	(14 dBk);
Class C2	stations must exceed	3 kW	(4.8 dBk);
Class C1	stations must exceed	50 kW	(17 dBk); and
Class C	stations must equal	100 kW	(20 dBk).

(2) Class C stations must have a minimum antenna height above average terrain of at least 300 meters (984 feet). No minimum antenna height above average terrain is specified for Classes A, B1, B, C2, or C1 stations.

(b) *Maximum power and antenna height.* (1) The maximum effective radiated power in any direction and maximum antenna height above average terrain (HAAT) for the various classes of stations are listed below:

Class	*Maximum Power*	*Maximum antenna HAAT in meters (feet)*
A	3kW (4.8 dBk)	100 (328)
B1	25 kW (14.0 dBk)	100 (328)
B	50 kW (17.0 dBk)	150 (492)
C2	50 kW (17.0 dBk)	150 (492)
C1	100 kW (20.0 dBk)	300 (984)
C	100 kW (20.0 dBk)	600 (1968)

(2) Antenna heights may exceed that specified in this paragraph if the effective radiated power is reduced so that the distance to the 1 mV/m (60dBu) contour extends no farther than it would if the station were operating with the maximum power and antenna HAAT for its particular class of station. The location of the 1 mV/m (60 dBu) contour is determined using Figure 1 of § 73.333. The antenna HAAT is determined using the procedure contained in § 73.313. When antenna HAAT is less than 30 meters (100 feet), an antenna HAAT of 30 meter (100 feet) must be assumed to determine equivalence. When a station's effective radiated power must be reduced below the normal minimum for its class (specified in paragraph (a)(1) of this Section) the value determined will be the minimum for the particular station involved.

(3) For Class B stations in Puerto Rico and the Virgin Islands, a maximum antenna HAAT of 600 meters (1968 feet) with an effective radiated power of 25 kW will be allowed. For antenna heights above 600 meters (1968 feet), the power must be reduced so that the station's 1 mV/m contour (located pursuant to Figure 1 of § 73.333) will extend no farther from the station's transmitter than with the maximum facilities allowed. For powers above 25 kW (up to 50 kW), no antenna height will be authorized that results in greater coverage by the 1 mV/m contour than can be obtained with the maximum facilities.

(c) *Existing stations.* Stations authorized prior to [the effective date of the Report and Order in BC Docket 80–90] that do not conform to the requirements of this Section, may continue to operate as authorized. Stations operating with facilities in excess of those specified in paragraph (b) of this Section may not increase their effective radiated powers or extend their 1 mV/m field strength contour beyond the location permitted by their present authorizations. The provisions of this Section will not apply to applications to increase facilities for those stations operating with less than the minimum power specified in paragraph (a) of this Section.

10. Section 73.212 is amended by revising paragraph (b) to read as follows:

§ 73.212 Administrative changes in authorizations.

* * * * *

(b) Antenna heights above average terrain will be rounded out to the nearest meter.

11. Section 73.213 is amended by revising paragraphs (a), (e), and subparagraphs (f)(2)(ii) and (iii) to read as follows:

§ 73.213 Stations and spacings below the minimum separations.

(a) Stations authorized prior to November 16, 1964, at locations that do not meet the minimum distances specified in § 73.207 may apply for changes in facilities if the requested facilities conform to those listed in the following table:

Facilities To Be Authorized For Short-Spaced FM Stations

Class of Station	*Separation in kilometers*		*Facilities authorized*	
	Co-channel	*First adjacent*	*Power (kW)*	*Antenna height (meters)*
A to A	72–105		3	100
A to A	64–71		2	100
A to A	less than 64		1	100
A to B		80–105	3	100 Class A
			50	150 Class B
A to B		64–79	3	100 Class A
			20	150 Class B
A to B		less than 64	3	100 Class A
			10	150 Class B
A to C		129–169	3	100 Class A
			100	600 Class C
A to C		97–128	3	100 Class A
			50	600 Class C
A to C		less than 97	3	100 Class A
			100	600 Class C
B to B	201–241	129–169	50	150
B to B	161–200	105–128	20	150
B to B	121–160	80–104	10	150
B to B	less than 121	less than 80	5	150
B to C	225–274	177–217	50	150 Class B
			100	600 Class C

B to C	177–224	137–176	20	150 Class B
			50	600 Class C
B to C	145–176	97–136	10	150 Class B
			20	600 Class C
B to C	less than 145	less than 97	5	150 Class B
			10	600 Class C
C to C	241–290	201–241	100	600
C to C	193–240	153–200	50	600
C to C	161–192	121–152	20	600
C to C	less than 161	less than 121	10	600

* * * * *

(e) The powers listed in the table are the maximums the FCC will authorize. Antenna heights may exceed those specified in the table if the effective radiated power is reduced so that the 1 mV/m contour extends no further than it would with the maximum power and antenna height. The antenna height value to be used is that above average terrain and not that in any particular direction. When antenna heights are less than 30 meters (100 feet), a value of 30 meters (100 feet) must be assumed for the purposes of this paragraph.

(f) * * *

* * * * *

(2) * * *

(i) * * *

(ii) When a station does not meet the minimum separations to co-channel or first adjacent channel stations, it may apply for up to the maximum listed facilities for the separations that would exist at the new transmitter site. (See subdivision (iii) of this subparagraph for further restrictions on very short-spaced stations).

(iii) The provisions of this subparagraph apply where the resulting separation after the move would be less than: co-channel, 64 kilometers Class A to Class A, 121 kilometers Class B to Class B, 145 kilometers Class B to C or vice versa, or 161 kilometers Class C to Class C; first adjacent channel 64 kilometers Class A to Class B or vice versa, 80 kilometers Class B to Class B, 97 kilometers Class A or B to Class C, or vice versa, and 121 kilometers Class C to Class C. Stations so situated may apply to move and use either their present facilities or no more than those specified for their distance brackets in paragraph (a) of this Section, if the move would not decrease the short distance by more than 5 kilometers. If the move would decrease the short distance a greater amount, a station will be permitted no more than the facilities that would give it, in the critical direction, a 1 mV/m contour located no further out than that which would result from using the former location and the maximum facilities specified for the distance bracket.

Note. For the purposes of the above Section, Classes B1 and C2 will be considered Class B and Class C1 will be considered Class C until further notice.

12. Section 73.220 amended.

In paragraph (a) the phrase "500 feet" is revised to read "150 meters (492 feet)."

13. Section 73.240 amended.

In paragraph (a)(2) the phase "100 miles" is revised to read "160 kilometers (100 miles)."

14. Section 73.310 is amended by revising the headnote and the first two definitions in paragraph (a) to read as follows:

§ 73.310 FM technical definitions.

(a) *Antenna height above average terrain, (HAAT).* HAAT is calculated by: determining the average of the antenna heights above the terrain from 3 to 16 kilometers (2 to 10 miles) from the antenna for the eight directions evenly spaced for each 45 ° of azimuth starting with True North (a different antenna height will be determined in each direction from the antenna); and computing the average of these separate heights. In some cases less than eight directions may be used. (See § 73.313(d).) Where circular or elliptical polarization is used, the antenna height above average terrain must be based upon the height of the radiation of the antenna that transmits the horizontal component of radiation.

Antenna power gain. The square of the ratio of the root-mean-square (RMS) free space field strength produced at 1 kilometer in the horizontal plane in millivolts per meter for 1 kW antenna input power to 221.4 mV/m. This ratio is expressed in decibels (dB). If specified for a particular direction, antenna power gain is based on the field strength in that direction only.

* * * * *

15. Section 73.313 is amended by revising paragraphs (c) [introduction], (c)(1), (d), (e), (f), (g), and (h) to read as follows:

§ 73.313 Prediction of coverage.

* * * * *

(c) In predicting the distance to the field strength contours, the F(50,50) field strength chart, Figure 1 of § 73.333 must be used. The 50% field strength is defined as that value exceeded for 50% of the time.

(1) The F(50,50) chart gives the estimated 50% field strengths exceeded at 50% of the locations in dB above 1 uV/m. The chart is based on an effective power radiated from a half-wave dipole antenna in free space, that produces an unattenuated field strength at 1 kilometer of about 107 dB above 1 uV/m (221.4 mV/m).

* * * * *

(d) The antenna height to be used with this chart is the height of the radiation center of the antenna above the average terrain along the radial in question. In determining the average elevation of the terrain, the elevations between 3 and 16 kilometers from the antenna site are used.

(1) Profile graphs must be drawn for eight radials beginning at the antenna site and extending 16 kilometers therefrom. The radials should be drawn for each 45 ° of azimuth starting with True North. At least one radial must include the principal community to be served even though it may be more than 16 kilometers from the antenna site. However, in the event none of the evenly spaced radials include the principal community to be served, and one or more such radials are drawn in addition, these radials must not be used in computing the antenna height above average terrain.

(2) Where the 3 to 16 kilometers portion of a radial extends in whole or in part over a large body of water or extends over foreign territory but the 50 uV/m contour encompasses land area within the United States beyond the 16 kilometers portion of the radial, the entire 3 to 16 kilometers portion of the radial must be included in the computation of antenna height above average terrain. However, where the 50 uV/m contour does not so encompass United States land area and (i) the entire 3 to 16 kilometers portion of the radial extends over large bodies of water or foreign territory, such radial must be completely omitted from the computation of antenna height above average terrain, and (ii) where a part of the 3 to 16 kilometers portion of a radial extends over large bodies of water or over foreign territory, only that part of the radial extending from the 3 kilometers sector to the outermost portion of land

area within the United States covered by the radial must be used in the computation of antenna height above average terrain.

(3) The profile graph for each radial should be plotted by contour intervals of from 12 to 30 meters and, where the data permits, at least 50 points of elevation (generally uniformly spaced) should be used for each radial. In instances of very rugged terrain where the use of contour intervals of 30 meters would result in several points in a short distance, 60 or 120 meter contour intervals may be used for such distances. On the other hand, where the terrain is uniform or gently sloping the smallest contour interval indicated on the topographic map should be used, although only relatively few points may be available. The profile graph should indicate the topography accurately for each radial, and the graphs should be plotted with the distance in kilometers as the abscissa and the elevation in meters above mean sea level as the ordinate. The profile graphs should indicate the source of the topographical data used. The graph should also show the elevation of the center of the radiating system. The graph may be plotted either on rectangular coordinate paper or on special paper that shows the curvature of the earth. It is not necessary to take the curvature of the earth into consideration in this procedure, as this factor is taken care of in the charts showing signal strengths. The average elevation of the 13 kilometer distance between 3 and 16 kilometers from the antenna site should then be determined from the profile graph for each radial. This may be obtained by averaging a large number of equally spaced points, by using a planimeter, or by obtaining the median elevation (that exceeded for 50% of the distance) in sectors and averaging those values.

(4) Examples of HAAT calculations:

(i) The heights above average terrain on the eight radials are as follows:

	Meters
0°	120
45°	255
90°	185
135°	90
180°	–10
225°	–85
270°	40
315°	85

The antenna height above terrain (defined in § 73.310(a)) is computed as follows:

$$(120 + 255 + 185 + 90 - 10 - 85 + 40 + 85) / 8 = 85 \text{ meters.}$$

(ii) Same as (i), except the O ° radial is entirely over sea water. The antenna height above average terrain is computed as follows (note that the divisor is 7 not 8):

$$(255 + 185 + 90 - 10 - 85 + 40 + 85) / 7 = 80 \text{ meters.}$$

(iii) Same as (i), except that only the first 10 kilometers of the 90 ° radial are in the United States; beyond 10 kilometers the 90 ° radial is in a foreign country. The height above average terrain of the 3 to 10 kilometer portion of the 90 ° radial is 105 meters. The antenna height above average terrain is computed as follows (note that the divisor is 8 not 7.5):

$$(120 + 255 + 105 + 90 - 10 - 85 + 40 + 85) / 8 = 75 \text{ meters.}$$

(e) In cases where the terrain in one or more directions from the antenna site departs widely from the average elevation of the 3 to 16 kilometer sector, the prediction method may indicate contour distances that are different from what may

be expected in practice. For example, a mountain ridge may indicate the practical limit of service although the prediction method may indicate otherwise. In such cases, the prediction method should be followed, but a supplemental showing may be made concerning the contour distances as determined by other means. Such supplemental showings should describe the procedure used and should include sample calculations. Maps of predicted coverage should include both the coverage as predicted by the regular method and as predicted by a supplemental method. When measurements of area are required, these should include the area obtained by the regular prediction method and the area obtained by the supplemental method. In directions where the terrain is such that antenna heights less than 30 meters for the 3 to 16 kilometer sector are obtained, an assumed height of 30 meters must be used for the prediction of coverage. However, where the actual contour distances are critical factors, a supplemental showing of expected coverage must be included together with a description of the method used in predicting such coverage. In special cases, the FCC may require additional information as to terrain and coverage.

(f) The effect of terrain roughness on the predicted field strength of a signal at points distant from an FM transmitting antenna is assumed to depend on the magnitude of a terrain roughness factor (h) which, for a specific propagation path, is determined by the characteristics of a segment of the terrain profile for that path 40 kilometers in length located between 10 and 50 kilometers from the antenna. The terrain roughness factor has a value equal to the distance, in meters, between elevations exceeded by all points on the profile for 10% and 90% respectively, of the length of the profile segment. (See § 73.333, Figure 4.)

(g) If the lowest field strength value of interest is initially predicted to occur over a particular propagation path at a distance that is less than 50 kilometers from the antenna, the terrain profile segment used in the determination of terrain roughness factor over that path must be that included between points 10 kilometers from the transmitter and such lesser distances. No terrain roughness correction need be applied when all field strength values of interest are predicted to occur 10 kilometers or less from the transmitting antenna.

(h) Profile segments prepared for terrain roughness factor determinations are to be plotted in rectangular coordinates, with no less than 50 points evenly spaced within the segment using data obtained from topographic maps with contour intervals of approximately 15 meters (50 feet) or less if available.

* * * * *

16. Section 73.314 is amended by revising paragraphs (b)(1)(ii), (b)(2) [introduction], and subparagraphs (ii), (v), (vii), and (viii) to read as follows:

§ 73.314 Field strength measurements.

(b) * * *

(1) * * *

(i) * * *

(ii) Each radial is marked, at a point exactly 16 kilometers from the transmitter and, at greater distances, at successive 3 kilometer intervals. Where measurements are to be conducted over extremely rugged terrain, shorter intervals may be used, but all such intervals must be of equal length. Accessible roads intersecting each radial as nearly as possible at each 3 kilometer marker are selected. These intersections are the points on the radial at which measurements are to be made, and are referred to subsequently as measuring locations. The elevation of each measuring location should approach the elevation at the corresponding 3 kilometer marker as nearly as possible.

(2) *Measurement procedure.* All measurements must be made utilizing a receiving

antenna designed for reception of the horizontally polarized signal component, elevated 9 meters above the roadbed. At each measuring location, the following procedure must be used:

(i) * * *

(ii) The antenna is elevated to a height of 9 meters.

* * * * *

(v) A mobile run of at least 30 meters is made, that is centered on the intersection of the radial and the road, and the measured field strength is continuously recorded on a chart recorder over the length of the run.

* * * * *

(vii) If, during the test conducted as described in paragraph (b)(2)(iii) of this Section, the strongest signal is found to come from a direction other than from the transmitter, after the mobile run prescribed in subparagraph (b)(2)(v) of this Section is concluded, additional measurements must be made in a "cluster" of at least five fixed points. At each such point, the field strengths with the antenna oriented toward the transmitter, and with the antenna oriented so as to receive the strongest field, are measured and recorded. Generally, all points should be within 60 meters of the center point of the mobile run.

(viii) If overhead obstacles preclude a mobile run of at least 30 meters, a "cluster" of five spot measurements may be made in lieu of this run. The first measurement in the cluster is identified. Generally, the locations for other measurements must be within 60 meters of the location of the first.

* * * * *

(c) * * *

* * * * *

(2) *Measurement procedure.* All measurements must be made using a receiving antenna designed for reception of the horizontally polarized signal component, elevated 9 meters above ground level.

* * * * *

17. Section 73.316 is amended by revising the headnote and paragraph (e) to read as follows:

§ 73.316 FM antenna systems.

* * * * *

(e) Applications proposing the use of FM transmitting antennas in the immediate vicinity (*i.e.* 60 meters or less) of other FM or TV broadcast antennas must include a showing as to the expected effect, if any, of such approximate operation.

* * * * *

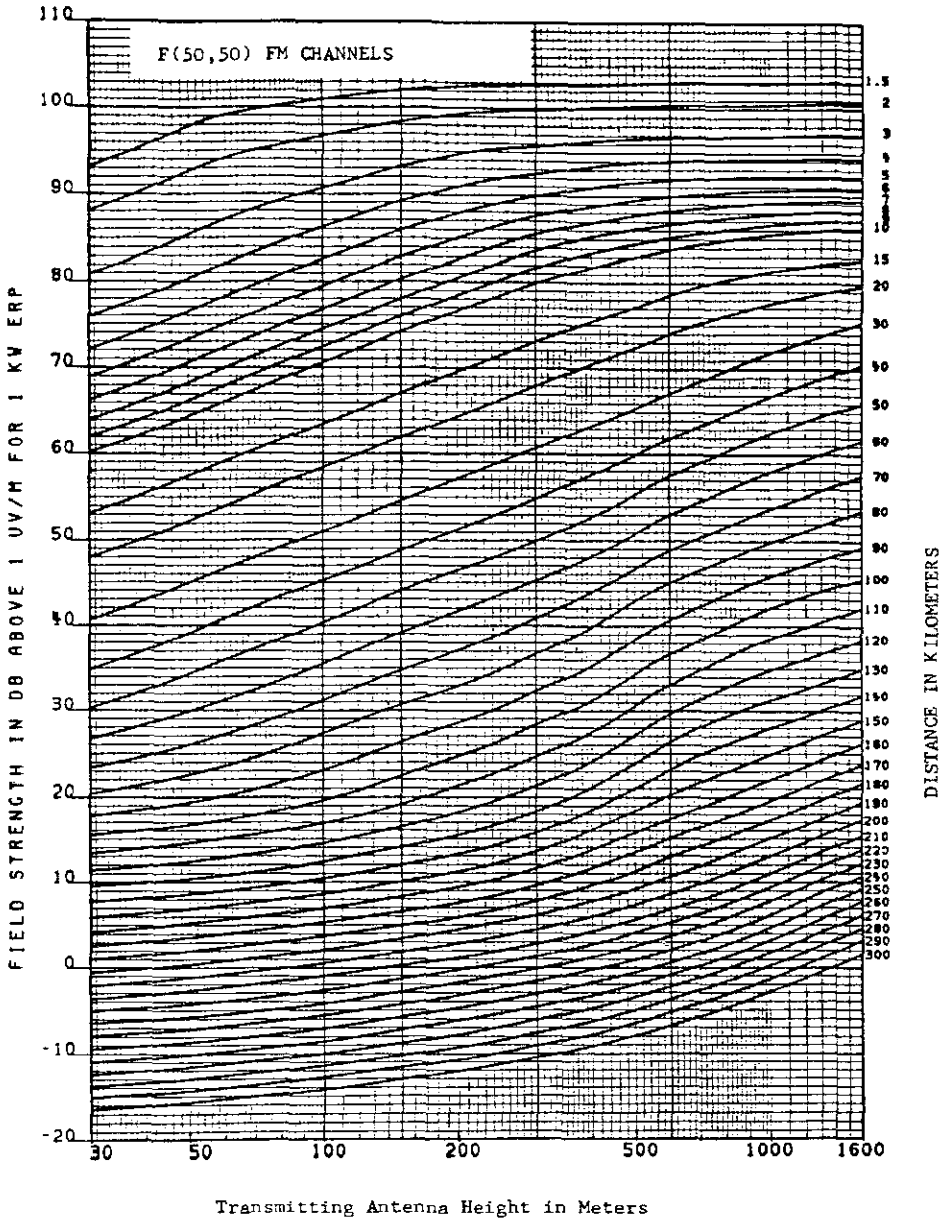
18. Section 73.333 is amended by revising the introductory text, Figures 1 and 1a, and deleting Figure 3 as follows:

§ 73.333 Engineering charts.

This Section consists of the following Figures 1, 1a, and slider, 4, and 5 (Figure 3 deleted).

* * * * *

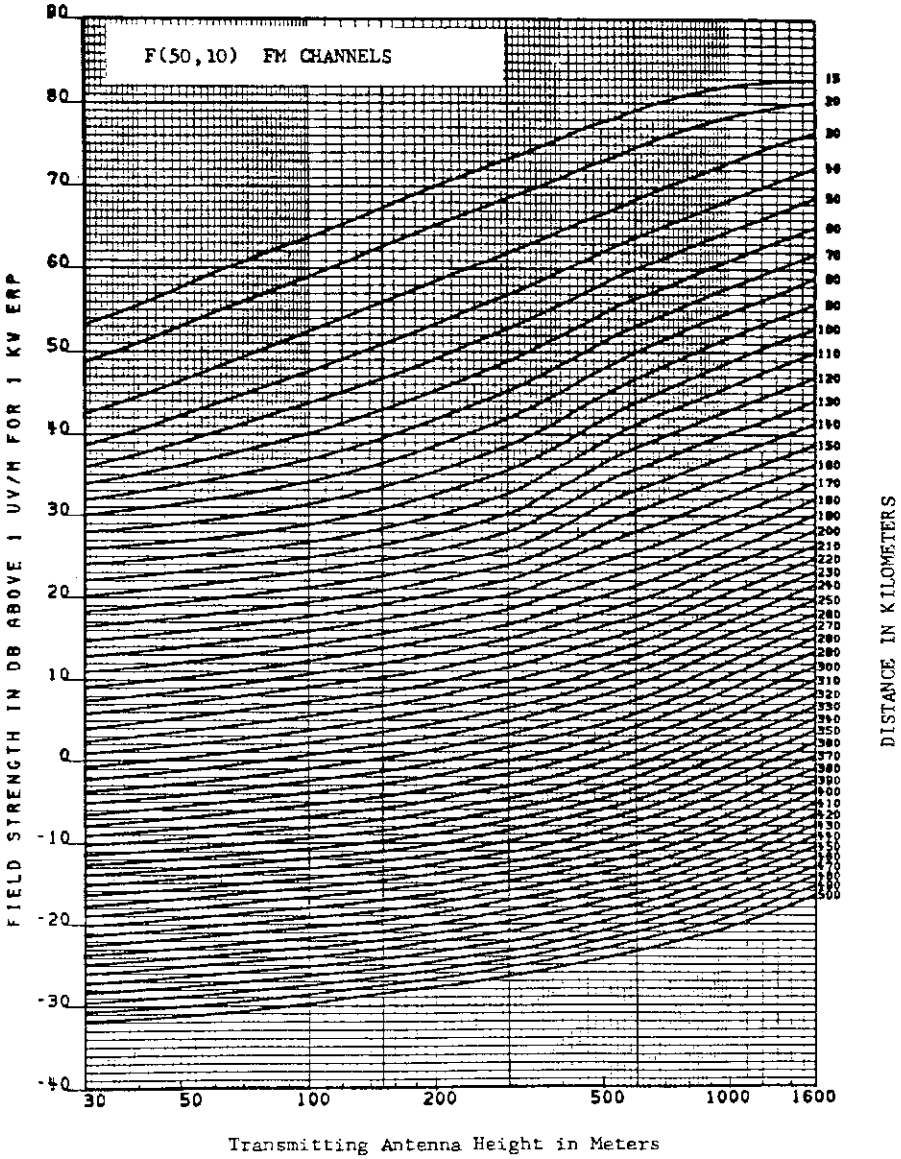
19. Section 73.504 is amended by revising the introduction of paragraph (c) to read as follows:



FCC §73.333 FIGURE 1

FM CHANNELS

ESTIMATED FIELD STRENGTH EXCEEDED AT 50 PERCENT OF THE POTENTIAL RECEIVER LOCATIONS FOR AT LEAST 50 PERCENT OF THE TIME AT A RECEIVING ANTENNA HEIGHT OF 9 METERS



FCC §73.333 FIGURE 1a

FM CHANNELS

ESTIMATED FIELD STRENGTH EXCEEDED AT 50 PERCENT OF THE POTENTIAL RECEIVER LOCATIONS FOR AT LEAST 10 PERCENT OF THE TIME AT A RECEIVING ANTENNA HEIGHT OF 9 METERS

§ 73.504 Channel assignments under the U.S.A.-Mexico FM Broadcast Agreement.

* * * * *

(c) The minimum distance separations given in § 73.207 apply to the following:

* * * * *

20. Section 73.506 is amended by revising the headnote and paragraphs (a)(3) and (b), and by adding new paragraph (c) to read as follows:

§ 73.506 Classes of Noncommercial Educational FM stations and channels.

(a) * * *

* * * * *

(3) Noncommercial educational stations with more than 0.01 kW transmitter power output are classified Class A, B1, B, C2, C1, or C, depending on the effective radiated power, antenna height above terrain, and the zone in which the station's transmitter is located, on the same basis as provided for in §§ 73.205, 73.206, and 73.211 for stations on the non-reserved FM channels.

(b) Any noncommercial educational station except Class D may be assigned to any of the channels listed in § 73.501. Class D noncommercial educational FM stations applied for or authorized prior to June 1, 1980, may continue to operate on their authorized channels subject to the provisions of § 73.512.

21. Section 73.507 is amended by revising paragraph (c) and note to read as follows:

§ 73.507 Minimum distance separation between stations.

* * * * *

(c)(1) Stations separated in frequency by 10.6 or 10.8 MHz (53 or 54 channels) from allotments or assignments on non-reserved channels will not be authorized unless they conform to the following separation table:

Class of stations:	Required spacing kilometers	(miles)
A to A	8	(5)
B to A	16	(10)
B to B	24	(15)
C to A	32	(20)
C to B	40	(25)
C to C	48	(30)

(2) Under the United States-Mexican FM Broadcasting Agreement, for stations and assignments differing in frequency by 10.6 to 10.8 MHz (53 or 54 channels), the following separations apply to U.S. noncommercial educational FM allotments and assignments and Mexican allotments or assignments in the border area.

Class of stations:	Required spacing kilometers	(miles)
C to D	24	(15)
B to D	16	(10)
C to D	8	(5)
D to D	3	(2)

Note. For purposes of this Section, Classes B1 and C2 will be considered Class B, and Class C1 will be considered Class C until further notice.

22. Section 73.509 is amended by revising paragraph (e) to read as follows:

§ 73.509 Protection from interference.

* * * * *

(e) No application for FM Channel 200 will be accepted if the requested facility would cause interference to Channel 6 operations, including TV translators on this channel. Such objectionable interference will be considered to exist whenever the 15 dBu contour of the proposal, based on the F(50,10) curves in § 73.333 Figure 1a, would overlap the 40 dBu contour of the television station, based on the F(50,50) curves in § 73.333 Figure 1.

23. Section 73.511 is amended by revising paragraph (b) to read as follows:

§ 73.511 Power and antenna height requirements.

* * * * *

(b) On Channels 218, 219, and 220 specified in § 73.501, no educational station will be authorized with effective radiated power greater than that specified in § 73.211(b)(1) for the respective class of station, and the maximum effective radiated power permissible shall also be subject to the provisions of § 73.211(b)(2).

23. Section 73.3573 is amended by revising paragraphs (a)(1) and (c) as follows:

§ 73.3573 Processing FM broadcast and FM translator station applications.

(a) * * *

(1) In the first group are applications for new stations or for major changes in the facilities of authorized stations. A major change for FM stations authorized under this Part is any change in frequency, station location, or class of station; or, any antenna location which would result in a change of 50% or more in the area within the station's predicted 1 mV/m field strength contour. (A change in area is defined as the sum of the area gained and the area lost as a percentage of the original area.) For FM translator stations authorized under Part 74, it is any change in frequency (output channel), primary stations, or authorized principal community or area. However, the FCC may, within 15 days after the acceptance for filing of any other application for modification of facilities, advise the applicant that such application is considered to be one for a major change and therefore is subject to the provisions of §§ 73.3580 and 1.1111 pertaining to major changes.

* * * * *

(c) If, upon examination, the FCC finds that the public interest, convenience and necessity will be served by the granting of an application for FM broadcast facilities, the same will be granted. If the FCC is unable to make such a finding and it appears that a hearing may be required, the procedure given in § 73.3593 will be followed.

* * * * *

Dissenting Statement of FCC Commissioner James H. Quello

In Re: FM Drop-Ins - Docket No. 80–90

I don't believe the engineering record or the hypothetical need developed in Docket 80–90 justifies the proposed widescale increase in FM allotments.

This action would cause degraded service, turmoil and interference for millions of existing listeners, contention and litigation among applicants and further administrative burdens on a Mass Media Bureau already overburdened with a huge backlog of AM-FM and low power TV applications.

I believe a wiser, more reasoned approach would be to present new FM allotments on a case-by-case basis through waiver requests. This would provide an opportunity to actually test the extent of interference and overall public acceptance before risking an untested, strongly contested, widescale increase and reallotment.

I lend considerable weight to the expert engineering study by A. D. Ring which indicates a net loss in service would result in the Commission's proposals. I agree with the logic in the study that any increase in FM availability would cause a significant detriment to present listening. Also, I believe it is a rule of physics, not of this Commission, that a new station causes interference far beyond the boundaries of new service.

I'm concerned that the value of a strong secondary service now enjoyed by millions of listeners is allotted a much lower priority than the undocumented need for a new, frequently substandard, FM service. I also believe FM stereo should be treated as a significant state of the art improvement in basic service, rather than as a mere expendable ancillary enhancement.

To the extent that the Commission has relied upon the "need" for vastly increased FM allotments, I believe it has been misled. I have seen nothing in the record which documents this alleged need beyond some "wish lists" prepared on a hypothetical basis and largely for purposes other than this *Rulemaking*.

The only rational public interest reason for embarking upon this massive change in the Table of Allotments is to provide for better, more diversified FM radio service to the American people. The fact is, however, this revised scheme of allocation will merely provide different service in many instances and reduced or deleted service in others. As suggested before, it is axiomatic that for each new service introduced, interference to existing service is also introduced. For some listeners, their present stereo service will become monaural. For others, their present monaural service will become further degraded or disappear.

SEPARATE STATEMENT OF COMMISSIONER HENRY M. RIVERA

RE: Modification of FM Technical Rules to Increase the Availability of Broadcast Stations—BC Docket 80-90.

By this decision, the Commission has dramatically increased the potential for local FM radio service to the American public and the enhanced competition and diversity that increased service implies. The Commission's staff forecasts that many major cities, where additional outlets were previously foreclosed, will now be eligible for additional stations as a consequence of today's rule changes. Many communities in remote locations will now qualify for their first local

service as well. All told, the Mass Media Bureau estimates that this decision will make it possible to satisfy as much as 57 percent of the expressed demand for additional FM radio stations; under the old allocation structure, just seven percent of this demand could have been accommodated. More specifically, of the 1000 communities studied, additional stations can now be assigned to approximately 49 percent which have daytime-only AM service and 31 percent of those which have no local service. This action will also serve the interests of 40 percent of the communities said to need additional minority-owned stations, as well as the interests of 26 percent of the locations desiring additional public radio stations.

The public interest benefits of our decision are clear and substantial. Still, because the paramount objective of this proceeding has been to secure *additional* service, it was imperative for the Commission to ensure that the proposed technical changes to allow additional FM stations would not significantly degrade the FM service overall. With one exception (the uniform protected contour proposal), the Commission has concluded that the addition of new FM stations will not detract materially from the technical integrity of existing FM service, and I believe our determinations in this regard are both responsible and consistent with sound engineering principles.

The Commission has decided that, rather than entertaining random requests for the new channels made possible by these rule changes, most of these new channels should be allotted in one omnibus proceeding. Our decision to amend the FM Table of Allotments accordingly is especially wise. The licensing of additional FM stations will now proceed in a smooth and orderly fashion, which will minimize potential delays and maximize the expeditious delivery of new FM service consistent with FCC resources.

While I would have preferred more expeditious consideration of these proposals, I am delighted that we have finally and affirmatively acted upon them. And, although I wish resource limitations did not require postponing the effective date of our action until Fiscal Year 1984, we will still be moving forward during the intervening four months with preparation of the rulemaking that is required for the public to apply for stations under the newly adopted technical rules.

In sum, this Report and Order marks a renewed Commission commitment to the principles of diversity and competition—principles which must be the basis for the integrity and credibility of our ongoing broadcast deregulatory efforts. The public interest is well-served by this decision in and of itself, and I am especially pleased to see this long-awaited action taken at last.