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

PR Docket No. 93-60

In the Matter of

Co-channel Protection Criteria for Part 90, Subpart S Stations Operating above 800 MHz	RM-8028

NOTICE OF PROPOSED RULE MAKING

Adopted: March 11, 1993; **Released: April 7, 1993**

Comment Date: May 28, 1993
Reply Comment Date: June 14, 1993

By the Commission:

I. INTRODUCTION

1. On March 6, 1992, the National Association of Business and Educational Radio, Inc. (NABER) filed a Petition for Rule Making (Petition) concerning the rules that determine the co-channel protection criteria for 800/900 MHz private land mobile radio (PLMR) systems licensed on frequencies in the Business and General Categories.[1] In general response to the Petition, we are issuing this *Notice of Proposed Rule Making (Notice)* to consider revising the protection criteria and distance separations for co-channel stations operating above 800 MHz in all Part 90, Subpart S, service Pools.

II. BACKGROUND

2. In 1974, we established protection criteria and a minimum co-channel distance separation for PLMR stations operating in the 800 MHz band.[2] In 1982, we retained the 113 km (70 mi) mileage separation between Specialized Mobile Radio Service (SMR) co-channel stations, but modified the Rules to permit frequency coordinators to determine separation between non-SMR systems based on predicted 40/30 dBu signal strength contours.[3] In 1991, we adopted rules that permitted applicants for SMR stations to locate their base station transmitters closer to co-channel licensees than the standard 113 km (70 mi) separation without seeking a waiver of our rules.[4] SMR category stations were permitted to locate their base stations less than 113 km (70 mi) from existing co-channel stations either by obtaining consent from all co-channel licensees located within 113 km (70 mi) of the proposed facility, or by using the short-spacing Table in Section 90.621(b)(4) of the Rules, 47 C.F.R. § 90.621(b)(4). The Table based short-spacing distances upon the non-overlap of the existing station's 40 dBu service contour and the proposed short-spaced station's 22 dBu interference contour. Because the Table was intended as a substitute for our consideration of detailed engineering showings, the Table's parameters were designed to give a very conservative result that maximized the level of co-channel interference protection afforded existing licensees.

3. Since 1974, there have been significant improvements in equipment technical performance and system designs that have resulted in a marked increase in the development and licensing of wide-area, low-power, multi-site systems. These new wide-area systems have not been limited to SMR systems but are also being developed by eligibles in the non-SMR categories. Additionally, many SMR systems expanding into wide-area operations are requesting and utilizing frequencies assigned to non-SMR categories under the intercategory sharing provisions in the Rules. Therefore, because SMR and non-SMR systems above 800 MHz are technically and operationally similar, NABER has requested that the same interference protection criteria apply to all § 800/900 MHz systems operating under Part 90 of the Rules.[5]

III. DISCUSSION

Protection Criteria

4. In Docket No. 18262, our objective was to enable 800 MHz stations to provide a high quality signal to about 50 percent of locations for 50 percent of the time within an entire service area. To accomplish this required a signal approximately 20 dB above receiver threshold. At that time, receiver sensitivity was about 0.45 uv for 20 dB SINAD, and to obtain this signal level at a receiver, a field strength of 40 dBu was needed. For this field strength, the

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[1] Petition for Rule Making, RM-8028, filed on March 6, 1992. Comments were received from twelve parties. Reply comments were filed by NABER.

[2] *See* Second Report and Order, Docket No. 18262, 46 FCC 2d 773-775 (1974). The protection criteria provided a desired signal level of 40 dBu with an undesired signal level of 30 dBu at the edge of a station's service area. The "40/30 dBu" parameters resulted in a minimum co-channel station distance separation of 113 km (70 mi) for stations operating at maximum facility parameters of 1000 watts ERP and 305m (1000 ft) antenna height AAT.

[3] Second Report and Order, PR Docket No. 79-191, 52 RR 2d 11 (1982). For non-SMR systems, the rules specified that frequency coordinators should attempt to provide at the 40 dBu contour of the protected station an interference level of no more than 30 dBu. The 40/30 dBu ratio would generally result in a mileage separation of 113 km (70 mi). Separations of less than 113 km (70 mi) would be authorized if the terrain or other factors warranted a reduction. *See* § 90.621(c) and (d).

[4] *See* Report and Order, PR Docket No. 90-34, 6 FCC Rcd 4929 (1991). At first, the industry recommended that a 17 dB signal difference (40/23 dBu) be applied for short-spaced stations. The basic reason given for the 17 dB difference was that 17 dB was used by the cellular industry and was accepted by the Commission as a reasonable level of signal protection, The 17 dB figure was later modified to 18 dB to include a terrain variation factor, resulting in the 40/22 dBu ratio.

[5] For other filings concerning the current 40/30 dBu protection criteria, *See* Opposition of the Florida Coalition for Responsible Frequency Management, filed on January 8, 1993, and Petition for Partial Further Reconsideration, PR Docket No. 90-34, filed on October 21, 1992, by Motorola, Inc.

Commission's R-6602 curves,[6] corrected by 9 dB for mobile antenna height and 12 dB for urban clutter, indicate that a station operating at 1000 watts effective radiated power (ERP) with an antenna height of 305 m (1000 ft) above average terrain (AAT) would provide a service area slightly less than 32 km (20 mi). Over the years it has been generally accepted that the service area resulting from a 40 dBu signal level at the edge of a station's service area is adequate. Accordingly, we propose to retain 40 dBu as the desired signal level for acceptable performance at the edge of a station's service area. Because of improvements in the sensitivity of radio receivers, we seek comments on whether an acceptable signal can be achieved at the receiver with a field strength of less than 40 dBu, and whether the service areas of stations operating above 800 MHz should be calculated based on a field strength value of less than 40 dBu at the edge of the service area.

5. With respect to an undesired interfering signal level from a co-channel station, we stated in Docket No. 18262 that in order to maintain a usable quality of service with a margin to permit capture of the base station receiver by its own mobiles, an interfering signal from a distant co-channel station was required to be at least 10 dB below the desired signal. The interfering signal, therefore, could not exceed 30 dBu, and, translated into distance, the 40/30 dBu criteria required that co-channel stations be separated by a minimum of 113 km (70 mi). This 10 dB protection ratio was applied to all systems until 1991 when spacings closer than 113 km (70 mi), were, in limited circumstances, permitted for SMR applicants wishing to locate less than 113 km (70 mi) from a co-channel station without seeking a waiver. These spacings were determined using a 40/22 dBu protection ratio. *See* note 4, infra.

6. Comments on the Petition generally support a 40/22 dBu separation criteria for stations operating above 800 MHz on Business and General Category frequencies. Supporters argue that increased protection is needed because local topography results in lesser system performance than that indicated by calculations using the 40/30 dBu criteria,[7] increased mobile receiver sensitivity creates a need for greater co-channel protection,[8] wide-area systems need greater interference protection to ensure complete coverage,[9] and systems that use portables instead of mobiles need to be better protected.[10] *Also see* note 4, infra.

7. We conclude that there is merit to the arguments supporting a 40/22 dBu protection ratio. We have therefore, used the 40/22 dBu protection ratio to develop a proposed table for determining the separation distances. We note, however, the increased interest in the use of low-power, short-spaced stations for wide-area operations. We seek comment on whether the increased protection afforded existing stations by the 40/22 dBu criteria outweighs the fact that this greater protection would result in a decrease in frequency reuse from that obtainable using a 40/30 dBu ratio. We also seek comment on the assertion that because the cellular industry uses a 17 dB protection ratio, an 18 dB margin (17 dB with 1 dB correction) should apply to private land mobile radio systems.[11] Protection criteria is a most important and complex issue involving equipment parameters, system design, and propagation analysis. Our goal is to provide licensees with adequate protection and, at the same time, to achieve reasonable spectrum efficiency. Therefore, we ask for detailed comments supported by empirical data on whether 40/22 dBu is adequate, whether it is too conservative and protective, or whether some other protection ratio would be better for Part 90, Subpart S, systems operating above 800 MHz.

Standardized Protection Criteria for All Part 90, Subpart S, Radio Systems

8. Current rules require that SMR systems, except for stations meeting the short-spacing criteria, be separated by a minimum of 113 km (70 mi).[12] Non-SMR trunked systems are protected on the basis of a 40/30 dBu protection ratio.[13] Conventional 800 MHz systems that have met prescribed loading levels for channel exclusivity, are also protected on a 40/30 dBu basis.[14]

9. There is no apparent technical reason to have different protection criteria for SMR and non-SMR systems. Non-SMR system design is equivalent to that of SMR systems and thus the interference model/analysis should be the same for all systems regardless of the type of end user. Therefore, we conclude that to have separate protection criteria for SMR and non-SMR systems is restrictive, potentially confusing, and also burdensome from a licensing standpoint. Separation distances for both SMR and non-SMR stations operating pursuant to Section 90.621 of the Rules will be determined from the proposed Table. We, therefore, propose to amend the applicable rules to establish the same co-channel geographical separation criteria for all Part 90, Subpart S, operations.

Propagation Prediction Methodology

10. We recognize that the Commission's R-6602 curves are based upon average terrain conditions and may not be accurate for all possible situations because of specific local conditions. Our goal is to utilize a prediction method that is reliable for typical land mobile systems and that is not so sophisticated as to be burdensome for both applicants and the Commission. We, therefore, seek detailed comments on whether the Commission's R-6602 curves are generally adequate (as they exist or with modifications) or if some other

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[6] *See* FCC Report No. R-6602, Development of UHF and VHF Propagation Curves, September 7, 1966. The applicable curves, also given in 47 C.F.R. § 73.699, show estimated field strengths, for varying antenna heights, that are exceeded at 50 percent of the potential receiver locations for at least 50 percent of the time for the desired signal (Figure 10(b)), or for at least 10 percent of the time for the interfering signal (Figure 10(c)).

[7] Comments of Southern California Gas Co. at 2.

[8] Comments of Texas Utilities Electric Co. at 4 and Southern California Edison at 4.

[9] Comments of New England Power Service Co. at 3.

[10] Comments of Aeronautical Radio, Inc. at 4. They argue that with a 40/30 dBu criteria, low-powered portables (3 watts ERP) cannot operate simultaneously with high-powered (30 watts ERP) co-channel mobile units because the higher powered mobiles will capture the portable system's base station and prevent the portables from communicating.

[11] *See* n.4 infra. and Comments of NABER, PR Docket No. 90-34 at 10.

[12] *See* Section 90.621(b). Separation distances for the high elevation sites in California or Washington are as indicated in Sections 90.621(b)(1), (b)(2), and (b)(3).

[13] *See* Section 90.621(c).

[14] *See* Sections 90.621(d). Conventional systems above 800 MHz that participate in the regional planning process under the Public Safety National Plan (pursuant to Section 90.16) are not licensed in accordance with the 40/30 dBu protection ratio.

methodology, such as one of the many derivatives of the National Bureau of Standards' Technote 101 (including the Longley-Rice computer prediction model), or the Hata model based upon the Okamura land mobile model, would be more suitable for typical land mobile propagation predictions.[15]

Proposed Separation Distances

11. Station separation distances for SMR systems must currently satisfy the 113 km (70 mi) standard, or must meet those specified in the Table in Section 90.621(b), or may be calculated on a case-by-case basis using the 40/30 dBu criteria. As previously mentioned, the 113 km (70 mi) separation distance was determined using a 40/30 dBu protection ratio. Using a 40/22 dBu ratio as the protection criteria, would increase this separation to 137 km (85 mi). This additional separation distance does not offer any significant advantage over the current 113 km (70 mi) separation distance. The calculated distance to the radio horizon for a station with an antenna height of 305 m (1000 ft) is about 73 km (45 mi).[16] With an accepted service area of 32 km (20 mi), mobile units operating within that service area would thus be 8 km (5 mi) beyond the radio horizon of a co-channel base station located 113 km (70 mi) away. Additionally, mobiles do not communicate beyond the radio horizon of their own base station because of rapid degradation of received signals due to the earth's curvature. Thus, the 113 km (70 mi) separation distance appears to be a reasonable distance for separation of maximum facility co-channel stations.[17] We propose, therefore, to retain the 113 km (70 mi) distance between stations authorized 1000 watts ERP and 305 m (1000 ft) antenna height. We propose that stations requesting lower powers and/or antenna heights be able to locate closer to an existing station in accordance with a Table in proposed amendments to Section 90.621, as shown in the Appendix, that specifies proposed separation distances for stations of various transmitter ERP and antenna height configurations. For reasons previously discussed, the distances in this Table were calculated using the 40/22 dBu criteria. We specifically ask for comments on whether other methods of determining station separations to minimize interference, whether performed by the applicant, a frequency coordinator, or the Commission, would be more appropriate.

12. Low-power stations can be located closer than higher-powered stations. A point is reached, however, where interference to a base station from a neighboring mobile unit becomes the prime factor.[18] Taking mobile range into consideration, we conclude that a minimum separation distance is also required. We are therefore proposing that the minimum distance that will be authorized for short-spaced stations will be 80 km (50 mi) regardless of station parameters.

Transmitter Power/Antenna Height Limits

13. Section 90.635 defines and specifies the maximum power and antenna height limits for trunked, urban-conventional, and suburban-conventional systems. It also contains tables for derating transmitter power with respect to antenna heights for different required service areas. We request comments on whether there is still a need to distinguish between, and have separate rules for, stations in different settings and having different service area requirements.[19] As previously mentioned, we are also proposing that a station's nominal service area should remain 32 km (20 mi) and that the field strength at the edge of the service area should remain 40 dBu. In calculating these parameters, urban clutter is not taken into consideration. Currently, a maximum facility is one that is authorized to operate at 1000 w ERP and 305 m (1000 ft) HAAT. By not using an urban clutter correction, a station with 500 w ERP and 150 m (500 ft) would have a field strength of 40 dBu at a distance of 32 km (20 mi). We ask for comments on whether any significant advantage would be obtained if the maximum facility parameters were reduced. Additionally, in PR Docket No. 90-34, we adopted the use of a directional antenna height above average terrain (DHAAT).[20] We propose to continue using DHAAT as the parameter for antenna height.

Interference To/From Mobile Units

14. Commenters have stated that harmful interference can occur both to and from mobile units when operating under the 40/30 dBu criteria. Southern California Gas (SCG) states that a field strength of 22 dBu produces a signal strength of 0.5 uv at the mobile receiver terminals, 30 dBu produces 1.3 uv, and 40 dBu produces 4.3 uv. They also assert that current mobile receivers cannot discriminate between the 30 dBu (1.3 uv) or 40 dBu (4.3 uv) signals for either voice or data transmission. Because both of these signal levels are perceived by the receiver as "strong" signals, SCG claims a 30 dBu interference signal from a co-channel station can cause destructive interference to a mobile at the edge of its service area under the

[15] Several commenters on the Petition indicated that the R-6602 curves were outdated. Southern California Gas, Southern California Edison, and Texas Utilities Electric recommend use of Longley Rice/Technote 101 procedures. NABER, in its reply comments, discusses the shortcomings of the Longley-Rice methodology. The Industrial Telecommunications Association (ITA) proposes that the certified frequency coordinators have authority to require that the applicant provide a contour analysis generated by a terrain-based propagation method to assist the coordinator in its frequency recommendation. Comments of ITA at para. 11. Because we are proposing that separation distances will be determined from a table, frequency coordinators will no longer be required to perform analysis and base recommendations on the 40/30 dBu protection ratio currently specified in 47 C.F.R. § 90.621(c) and (d).

[16] This distance is approximate for smooth, spherical earth with a "k" factor of 4/3. Actual distances to the radio horizon are generally less due to the earth's curvature and terrain factors.

[17] A maximum facility is one that is authorized the specified maximum transmitter ERP at the specified maximum transmitter antenna height.

[18] As an example, with a 40/22 dBu protection ratio, two co-channel stations, each with 50 w ERP and 50 m antenna height, would each have a service area of 13 km (8 mi) and would be spaced 50 km (30 mi) apart. It is highly likely that a mobile will operate beyond this 13 km (8 mi) distance despite the reduced parameters of its base station. Such mobile operation would likely create co-channel interference problems.

[19] We propose to retain the greater separation requirements relating to certain locations in California and Washington. *See* note 12, infra.

[20] *See Memorandum Opinion and Order,* (Corrected), PR Docket No. 90-34, 7 FCC Rcd 6069 (1992).

current 40/30 dBu criteria.[21] Our proposal to utilize a 40/22 dBu protection ratio will alleviate this situation to a great extent by providing an 18 dB (a factor of about 8 in absolute voltage) difference in received signal level at the terminals of a mobile receiver operating at the edge of its service area. Receivers can accommodate this difference, and the 40 dBu desired signal will "capture" the receiver from the 22 dBu undesired signal, providing interference-free communications.

15. Motorola argues that by using a 40/30 dBu protection ratio to determine short-spacing, harmful interference can occur from mobile radios operating at and beyond their own 40 dBu service contour and in proximity to the base stations of co-channel systems.[22] Motorola further claims that short-spaced stations assigned under the 40/30 dBu ratio do not receive the same interference protection as those separated by the standard 113 km (70 mi). Motorola then presents an analysis that evaluates two co-channel stations operating under the 40/30 dBu ratio. Using typical equipment specifications, the selected scenario indicates that a mobile unit operating within the 40 dBu contour of its home station would provide an undesired signal level at a short-spaced station receiver that approaches 1 microvolt. This signal is about 12 dB above the 0.25 uv sensitivity rating of current base station receivers, and Motorola claims that this signal level will cause destructive interference to lower power desired transmissions originating within the station's own 40 dBu service area.

16. Historically, we have not considered the effect of mobile units when determining protection criteria. All considerations have been limited to base-to-base interference because one cannot predict where a mobile unit will be at any time. Mobile units can travel beyond their own service area and into the service area of a co-channel system and, if operated, could cause interference to the co-channel base station. Our proposal to utilize the more stringent 40/22 dBu protection ratio will do much to minimize co-channel interference from mobile units to short-spaced base stations. In the case of the Motorola scenario, an additional 8 db of protection will be obtained and the interfering signal would only be about 4 dB above the receiver sensitivity, enabling more of the "home" mobiles to capture their own base station receiver. Additional protection for such stations could be obtained by limiting the ERP of a mobile transmitter to some value to enable a mobile to communicate with its own base station, but also reduce the potential for interference to co-channel stations by mobiles near the edge of their actual service area.[23] We ask for comments on this issue, specifically as to what effect limiting mobile ERPs may have, or any other factors which may contribute to potential interference to and/or from mobile units.

IV. CONCLUSION

17. In this proceeding, we have considered the growth and development of 800/900 MHz systems for SMR and non-SMR use. We have noted that there is a narrowing of differences in the technical and operating parameters of these systems. We have therefore concluded that having separate rules governing separation distances for SMR and non-SMR systems is no longer appropriate. Accordingly, we are proposing rules that will apply to all systems operating above 800 MHz pursuant to Part 90, Subpart S, of the Rules. We believe that these proposals will simplify the rules concerning these systems and, from a licensing standpoint, will significantly reduce the burden upon both the applicant and the Commission.

18. We also emphasize herein that until this proceeding is terminated, applications, including non-SMR applications, for 800/900 MHz systems received after the adoption date of this *Notice* will not be accepted unless they are in accordance with the conditions set forth in 47 C.F.R. § 90.621(b).

V. PROCEDURAL MATTERS

Ex parte Rules - Non-Restricted Proceeding

19. This is a non-restricted notice and comment rule making proceeding. *Ex-parte* presentations are permitted except during the Sunshine Agenda period, provided that they are disclosed as provided in the Commission's Rules. *See generally* 47 C.F.R. §§ 1.202, 1.203, 1.1206(a).

Initial Regulatory Flexibility Analysis

20. We certify that the Regulatory Flexibility Act of 1980 does not apply to this rule making proceeding because if the rule amendments are promulgated there will not be a significant impact on a substantial number of small business entities, as defined by Section 601(3) of the Regulatory Flexibility Act. The proposed rule changes set forth in this *Notice* amend certain technical standards and have no negative economic consequences. The Secretary shall send a copy of this *Notice of Proposed Rule Making,* including the certification, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act, Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. Section 601 *et seq* (1981).

Comment Dates

21. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commissions Rules, 47 C.F.R. §§ 1.415 and 1.419, interested parties may file comments on or before **May 28, 1993,** and reply comments on or before **June 14, 1993.** To file formally in this proceeding, you must file an original and four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, Room 239, of the Federal Communications Commission, 1919 M Street, N.W. Washington, D.C. 20554.

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[21] Comments of Southern California Gas Co., RM-8028, RM-8029, RM-8030 at 3.

[22] Motorola Petition for Partial Reconsideration, PR Docket No. 90-34, at 9 and Technical Appendix.

[23] A reduction in mobile ERP will reduce the "talk in" range of a mobile when compared to the "talk out" power of its higher powered base station. Base station receivers are typically about 6 dB more sensitive than mobile receivers, thus somewhat extending a low-power mobile's "talk in" range.

22. Authority for issuance of this *Notice of Proposed Rule Making* is contained in Sections 4(i) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i) and 303(r).

23. For further information concerning this rule making, contact Eugene Thomson, Private Radio Bureau, Room 5202, Federal Communications Commission, Washington, D.C. 20554, telephone (202) 634-2443.

VI. ORDERING CLAUSE

24. IT IS ORDERED that, effective March 12, 1993, and until otherwise notified, the Commission will not accept applications for 800/900 MHz systems that do not meet the conditions set forth in 47 C.F.R. § 90.621(b).

FEDERAL COMMUNICATION COMMISSION

Donna R. Searcy

Donna R. Searcy
Secretary

APPENDIX

Part 90 of Chapter 1 of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

Part 90 - PRIVATE LAND MOBILE RADIO SERVICES

1. The authority citation for Part 90 continues to read as follows:

Authority: Secs. 4, 303, and 332, 48 Stat. 1066, 1082, as amended, 47 U.S.C. 154, 303, and 332, unless otherwise noted.

2. Section 90.621 is amended by revising paragraph (b) introductory text and the first sentence of paragraph (b)(3), revising paragraph (b)(4), removing paragraphs (b)(5), (b)(6), (c), and (d), and redesignating paragraphs (e), (f), (g), (h), (i) and (j) as paragraphs (c), (d), (e), (f), (g) and (h), respectively, to read as follows:

§ 90.621 Selection and assignment of frequencies.

* * * * *

(b) Trunked and conventional systems authorized on frequencies listed in this Subpart, except for those systems authorized pursuant to § 90.621(g), will be afforded protection solely on the basis of fixed mileage separation criteria. The separation between co-channel systems will be a minimum of 113 km (70 mi) with the following exceptions:

* * * * *

(3) Except as indicated in paragraph (b)(4) of this section, trunked systems located in the State of Washington at the following locations shall be separated from co-channel systems by a minimum of 169 km (105 miles). * * *

(4) Stations may be separated by less than 113 km (70 mi) by meeting certain transmitter ERP and antenna separation distances to provide protection to existing co-channel stations for various transmitter power and antenna height combinations. The minimum separation permitted will be 80 km (50 mi).

STATION SEPARATION TABLE

Existing Station ERP/DHAAT	Distance Between Stations (km) [1] [2] — Proposed Station ERP (watts)/DHAAT (meters) [3] [4]											
	1000 /305	1000 /150	1000 /50	500 /305	500 /150	500 /50	250 /305	250 /150	250 /50	50 /305	50 /150	50 /50
1000/305	113	113	113	113	113	105	113	109	97	108	96	83
1000/150	113	113	106	113	108	95	113	99	87	98	86	80
1000/50	113	113	94	113	96	83	104	87	80	86	80	80
500/305	113	113	112	113	113	101	113	105	93	104	92	80
500/150	113	113	103	113	105	92	113	96	84	95	83	80
500/50	113	113	89	110	92	80	100	83	80	82	80	80
250/305	113	113	108	113	110	97	113	101	89	100	88	80
250/150	113	111	98	113	100	87	108	91	80	90	80	80
250/50	113	100	86	107	89	80	97	80	80	80	80	80
50/305	113	111	98	113	100	87	108	91	89	90	80	80
50/150	113	103	89	110	92	80	100	83	80	82	80	80
50/50	113	96	82	113	85	80	93	80	80	80	80	80

[1] Separations for trunked systems on Santiago Peak, Sierra Peak, Mount Lukens, and Mount Wilson (CA) and the locations in the State of Washington listed in § 90.621(b)(3) are 56 km (35 mi) greater than those listed in the Table above. In the event of conflict between this table and the table of additional California high elevation sites shown in § 90.621(b)(2)(ii), the latter will apply.

[2] Distances shown were derived from the R-6602 curves and are based upon a non-overlap of the 22 dBu interference contour of the proposed station with the 40 dBu contour of the existing station(s). No consideration is given to the 40 dBu service contour of the proposed station and the 22 dBu contour of the existing station(s).

[3] When either the proposed or existing station's ERP and/or DHAAT are not indicated in the table, the next higher value(s) must be used.

[4] The directional height of the antenna above average terrain (DHAAT) is calculated from the average of the antenna heights above average terrain from 3 to 16 km (2 to 10 mi) from the proposed site along a radial extending in the direction of the existing station and the radials 15 degrees to either side of that radial.

* * * * *