Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 91-303
38244

In the Matter of	)	
	)	
Review of the Technical	)	MM Docket No. 87-267
Assignment Criteria for the	)	
AM Broadcast Service	)	

REPORT AND ORDER
(Proceeding Terminated)

Adopted: September 26, 1991 Released: October 25, 1991

By the Commission: Commissioner Quello concurring in part and issuing a separate statement; Commissioners Barrett and Duggan concurring and issuing separate statements.

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I. Introduction

1. This Report and Order concludes an important phase of this Commission's overall program for the transformation and revitalization of the AM broadcast service by the year 2000. AM radio was this country's first national medium of mass communications and, for more than a half century, its contribution to daily life in America was unquestioned. The AM

service was a unifying force throughout the country, providing a wealth of news, information, entertainment, education, and political dialogue readily accessible to virtually all Americans. In the process, it literally revolutionized the fabric of our daily lives, our dialogue and our democracy.

2. Over the years, however, channel congestion and interference, both radio- and environmentally-induced, have dramatically increased in the AM band. Coincident with this growth has been a decline in the fidelity of AM receivers. As a consequence, during the last twenty years there has been a well-documented shift of AM listeners to newer mass media services that offer higher technical quality and better aural fidelity. This shift in listenership has clearly dulled the competitive edge of this once vital service.

3. Nonetheless, we believe that AM radio continues to hold a valuable place on the communications landscape. AM service provides a significant number of outlets that contribute to the vital diversity of viewpoints and programming available to Americans.[1] Indeed, AM often offers the only radio service to listeners in a variety of circumstances, particularly those living in and traveling through rural areas. In view of the undisputed public importance of the AM service, we believe that innovative and substantial regulatory steps must be taken to ensure its health and survival.

4. For the past several years, the Commission has made an intensive effort to identify the service's most pressing problems and, where relevant and feasible, to adapt the regulatory environment for AM stations that will ameliorate those problems. Following the Mass Media Bureau's 1986 Report on the Status of the AM Broadcast Rules, and the subsequent Notice of Inquiry (Inquiry), 2 FCC Rcd 5014 (1987), we took several actions. These included improving our prediction of groundwave and nighttime skywave service and interference;[2] accepting interference-reducing modifications without competing applications;[3] eliminating grandfathered deleted AM station assignments;[4] and adopting a new emissions standard for adjacent channel interference to improve aural fidelity.[5] In conjunction with these individual actions, we issued last year a Notice of Proposed Rule Making (Notice), 5 FCC Rcd 4381

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[1]As of June 30, 1991, AM stations accounted for nearly half of the 10,924 licensed radio stations in the country.

[2]Report and Order in MM Docket No. 88-510, 5 FCC Rcd 4489 (1990); Report and Order in MM Docket No. 88-508, 5 FCC Rcd 4482 (1990).

[3]Report and Order in MM Docket No. 89-46, 5 FCC Rcd 4492 (1990).

[4]Id.

[5]Report and Order in MM Docket No. 88-376, 4 FCC Rcd 3835 (1989); recon. denied, 5 FCC Rcd 2598 (1990); Memorandum Opinion and Order in MM Docket No. 88-376 5 FCC Rcd 5191 (1990).

(1990), to initiate a comprehensive revision of the remaining AM technical and legal standards, rules and policies. Our goal was to facilitate an overall improvement and revitalization of the AM broadcast service, and to effectuate the necessary incorporation of new AM spectrum between 1605 and 1705 kHz into the existing AM band (535 to 1605 kHz).[6]

II. Summary

5. This Report and Order describes the actions resulting from our comprehensive review of the many regulatory areas which affect the AM service. As detailed below, our review has led us to adopt numerous revisions and adjustments, both major and minor, to the existing rules and policies governing the AM band. We intend and expect that these modifications will enhance the technical characteristics of AM broadcasting and thus provide the potential for improving AM service in the near future as well as in the long term.

6. The goal of this proceeding has been to refine and integrate various proposals into a comprehensive plan that will eventually achieve a significantly improved AM service. In response to the Inquiry, the commenters repeatedly emphasized the need to improve the technical quality of the AM service. The strategy initiated in the Notice and adopted in substantial part here consists of three essential and mutually supporting elements designed to serve that objective by reducing congestion and interference in the AM band. The first element ("Technical Standards") implements new and revised AM technical standards that should reduce over time the interference with which AM broadcasters must contend in their primary service areas. The next action ("Migration") selectively opens the ten newly available frequencies in the expanded band (1605-1705 kHz) to those existing AM stations which significantly contribute to congestion and interference in the existing band. Our action here initially restricting eligibility for expanded band authorizations to existing AM licensees is intended to redress the unique technical problems present in the AM service. It should be not be taken to suggest any generalized Commission policy favoring existing licensees over new entrants in other services where new or expanded opportunities may arise. The Commission remains fully committed to our diversity goals of providing opportunities for diverse voices in local communities. The third initiative ("Consolidation") affords broadcasters greater latitude and incentive to reduce interference through non-technical means.

7. To provide a specific structure for these revitalization efforts, we defined two models of AM station operation in the Notice, one for operation in the expanded band and one for operation in the existing band. (Notice at 4382.) Model I parameters, for expanded band stations, are intended to take advantage of the fact that there are currently no stations in the expanded band, and therefore define idealized facilities. Model I parameters include

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[6]In response to the Notice, more than 150 comments and reply comments were filed. The parties are listed in Appendix A.

fulltime operation with stereo, technical quality competitive with FM, 10 kW daytime power, 1 kW nighttime power, non-directional (or simple directional) antenna, and a 400-800 km spacing between co-channel stations. Model II parameters, for stations in the existing band, reflect the realities in that band -- particularly dense station population coupled with wide variations in spacing, power, antenna patterns, and interference protection -- and represent those attributes toward which the service can reasonably aspire. They include fulltime operation, competitive technical quality, and wide area daytime coverage with nighttime coverage at least 15% of daytime coverage.

8. **Technical Standards.** To facilitate movement in the direction of these models, we first take a number of actions which will improve the quality of service in the existing AM band. Many of these actions are made realizable, in part, by the opportunity for reduced interference and congestion that will result from mutual agreements among existing licensees and from the migration of stations to the expanded band. Most notably, we: (1) increase the first and second adjacent channel protection ratios to reduce adjacent channel interference and to promote the development of receivers with higher audio fidelity; (2) refine the methodology of calculating nighttime coverage and interference to more accurately measure interference effects, which should lead to an improvement in nighttime reception; and (3) in some cases, require a 10% interference reduction when modifications are made to AM station facilities, which should gradually reduce the overall presence of interference.

9. **Migration.** We next adopt a set of rules for the expanded band intended to reduce interference in the existing band, while facilitating the prompt initiation of high quality service in the new broadcasting spectrum. In this way, we intend to manage the migration process to maximize the benefits to the AM service as a whole. To achieve this objective, we adopt measures designed to encourage those stations whose migration would achieve the greatest interference reductions in the existing band to do so. We stand committed to our goal of creating a model AM service in the expanded band that will ensure that the full potential of AM broadcasting can be realized. To this end, we: (1) adopt an allotment plan for the AM expanded band that is based on wide station separations and low interference levels, in order to facilitate the universal establishment of Model I service in the expanded band; (2) rank competing migration proposals using factors related to the interference reduction and service provided; (3) specify minimum transmitting antenna efficiency to maximize the utilization of each allotment in the expanded band; (4) offer an eligibility preference to AM stereo broadcasting in the expanded band to ensure that the competitive benefits offered by the expanded band are more fully realized; and (5) allow dual ownership and operation of existing and expanded band stations for a transitional period of five years, with a corresponding waiver of duopoly and national ownership rules during the permissible period of dual operation.

10. **Consolidation.** We also take several actions in non-technical areas that should lead to a reduction in overall interference in the band and a reshaping of existing AM service. Specifically, we: (1) permit the issuance of tax certificates in conjunction with voluntary arrangements to reduce interference by discontinuing the operation of marginal stations; and

(2) relax our multiple ownership rules for those proposing changes in facilities that would result in a significant reduction of interference in the existing AM band. For the reasons stated in paragraph 182 below, we will not change the AM-FM programming duplication provisions at this time.

11. As to related matters, we also (1) relax the rules pertaining to Travelers Information Stations to allow for the authorization (on a secondary basis) of such stations on any assignable frequency in the AM band; and (2) discuss voluntary receiver standards.

12. Certain other rule changes described in the Notice were adopted in other proceedings with effective dates that were deferred pending the release of this Report and Order. (See para. 4, supra, and Notice at paras. 18-25.) As discussed in paragraph 218, our action today establishes an effective date for those rule changes. Finally, as discussed in paragraph 216, the "AM Freeze" that has been in effect since last year, pending today's action, is lifted as of the effective date of this Report and Order.

13. A principal point made in the Notice bears reiteration here. In reaching the decisions we announce today, our focus has been on those measures that will, in our judgment, attain the objective of AM service restoration rather than on measures that might more directly benefit one or more individual segments of the industry itself. The major issue in this rule making proceeding has been the revitalization, indeed the survival, of the AM broadcast service. Therefore, those whose interests have not been fully realized by these actions should note that we have attempted to balance their individual perspectives and needs with the ultimate goal of promoting the revitalization of the AM broadcast service as a whole. This is the principle by which we have been guided in assessing particular proposals. In the Notice we made it clear that proposals that do not comply with the AM improvement efforts being developed will generally be rejected in recognition of the fact that the overall public interest attendant to the revitalization of the AM band outweighs any particular broadcaster's individual perceived needs or desires.

III. Technical Standards

14. The first part of the overall AM Improvement scheme is to evaluate current technical standards and to identify and revise those related regulatory standards and procedures that have led to increased interference and reduced service in the AM band. As stated in the Notice, the Commission has already taken numerous steps, including the development of improved skywave and groundwave propagation models as well as the deletion from our records of unused facilities.[7] We today modify those regulations that, by permitting a decline in the quality of existing service, no longer serve to protect the public interest. While we separately address these technical items for the purposes of discussion, we remain acutely aware of their interrelationships and their potential impact on the AM service

[7]See Notice at paragraphs 19 through 22.

if considered individually.

A. Reclassification/Power Increases.

15. **Background/Proposal.** The current U.S. system for classification of AM broadcast stations was developed many years ago and paralleled the systems contained in earlier international agreements to which the United States was a signatory. Under this system, the AM broadcast service developed on the basis that frequencies and stations were each classified according to perceived usage - e.g., stations designed to provide wide-area service were assigned to channels designated for that use. The FCC rules classified channels as Clear, Regional or Local channels, and prescribed the classes of stations that were assigned on each type of channel.[8] As part of a general station assignment philosophy, discrete power levels were associated with specific classes of stations. Accordingly, the AM frequency band was divided into three classes of channels on which four classes of stations operated. U.S. stations were classed either as Class I, II, III or IV, with certain sub-classifications.[9] The maximum power depended on the class of station as follows:

Class of station	Maximum power permitted
I, II	50 kW
III	5 kW
IV	1 kW

16. Until recent years, this system of station assignments had not suffered from any apparent major drawbacks. This was true primarily for two reasons. First, the majority of AM stations in the Western Hemisphere were U.S. stations and were therefore assigned on a common basis. Except for Canada and Mexico, the number of stations in other countries was sufficiently small as to have minimal impact upon the U.S. Second, the countries which posed the greatest potential impact on the U.S. (i.e. Canada, Mexico and Cuba) were, along with the United States, parties to international agreements that generally reflected technical criteria consistent with our domestic rules.

17. Within the past ten years, the U.S. has become a party to the following new multilateral and bilateral international agreements that directly relate to existing AM band operations: the 1981 Rio Agreement, the 1984 U.S./Canada Agreement and the 1986 U.S./Mexico Agreement. Each of these agreements contain AM station classifications that differ from those currently specified in the FCC Rules. All of these agreements prescribe

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[8]For a description of the various classes of channels and stations, see Appendix E, Section 73.21, which, except for station classes, is essentially the same as the current rules.

[9]For example, Class II stations were sub-classified as Class II-A, II-B, II-C or II-D stations and differed generally only in their levels of protection, hours of operation and nighttime power ceilings.

three classes of AM stations: Class A, Class B, and Class C.

18. The Notice proposed to change the current system of AM station classification to conform to the international agreements to which the U.S. is a party. Class I stations would become Class A stations; Class II and III stations would become Class B; and Class IV stations would become Class C. We also proposed the establishment of a fourth class of station, Class D, which would include stations that do not have fully protected unlimited-time operation.[10]

19. In the Notice, we observed that most stations could be reclassified easily, but recognized that certain adjustments in nighttime protection levels for some sub-classes would be necessary.[11] For example, sub-classes II-A, II-B, II-C and III would, if changed to Class B, require changes to current nighttime protection levels. In the Notice, we proposed to adopt a nighttime protection level of 2.0 mV/m for all Class II-A, II-B, II-C and III stations, noting that this would constitute an obvious improvement in protection for all but the Class II-A stations.[12] We recognized that this would apparently affect Class II-A stations which are presently protected to the 0.5 mV/m contour. Observing, however, that only one of 12 existing Class II-A stations had service limited to less than 2.0 mV/m (1.8 mV/m), we tentatively concluded that this adverse effect was minimal.

20. Finally, in order to be further consistent with international agreements, the Notice also proposed to increase the maximum power of Class B stations to 50 kW. We noted that this change would allow stations, currently limited to a power no greater than 5 kW, an opportunity to increase coverage provided that all other technical criteria are met.

21. **Comments.** Commenters overwhelmingly supported the Notice for its attempt to bring the domestic FCC regulations into line with the international agreements. Of the few comments received regarding the revision of protected contours, some opposition was expressed to the small amount of potential additional interference that would be associated with a reclassification of the one Class II-A station and the corresponding reduction of its protected service area. The possibility of increased power for many Class III stations received broad support. Some commenters, however, expressed the need to maintain adequate interference protection should the power ceiling be raised.

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[10]This would consist of daytime-only stations, including those that operate with extended hours authorizations, namely Class II-D, Class II-S, Class III-D and Class III-S stations. Creation of this separate class would help to focus attention on a category of stations which has its own set of special needs. These stations would be notified internationally as Class B.

[11]Stations are protected at night to the values specified in Section 73.182 or to higher values resulting from interference imposed by authorized facilities of other stations. In practice, most stations are protected to values which are higher than the specified nominal values.

[12]Stations presently limited to more than 2.0 mV/m would be protected at the higher level.

22. **Discussion.** In reaching a decision on this issue, we address three elements that are related to the reclassification process. They are: administrative convenience, changes to protection criteria, and changes in power level restrictions.

23. First, with respect to administrative convenience, the process by which the FCC administers the AM service requires considerable coordination with other countries, compliance with several treaties and participation in a complex notification process with international bodies. Confusion would be avoided and administrative burdens on the FCC and the industry would be greatly eased by adoption of a single classification and nomenclature system. For those reasons, we are adopting the classification revisions as proposed in the Notice.[13]

24. Second, with regard to changes to protection criteria, only one station (out of nearly 5,000) has been identified as being adversely impacted. That station, a Class II-A, is currently protected to a value slightly less than we proposed. While it is disconcerting to adopt rules that would permit an increase in interference to this or any other station, we find that no new information has been provided that would persuade us to alter our initial conclusion. We continue to believe that the practical impact of the potential for minor increased interference to a single station is not of an overriding nature, especially when balanced against the overall benefits of reclassification for the entire AM service such as consistency with other countries, and simplified administrative procedures. Furthermore, we note that the overall improved protection criteria adopted herein could act to offset this apparent effect. Accordingly, we are adopting revised nighttime protection levels as proposed.[14]

25. Third, as to the power level question, we note strong support for an increase in the maximum permissible power level for Class B stations. This would allow stations to

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[13]Stations migrating to the expanded band will be categorized as nominal Class B facilities. Use of the term "nominal Class B" facility is intended to distinguish expanded band stations, awarded by allotment plan procedures, from existing band Class B facilities, governed by assignment procedures. Service contour protection requirements given in Section 73.182 of the Rules will not apply initially among nominal Class B facilities in the expanded band since the station spacings prescribed in the allotment plan will form the basis for interference protection rights unless otherwise specified. Because of the adjacent channel relationships, service contour protection requirements will apply from the effective date of this order between stations in the expanded band on channels 1610, 1620 and 1630 kHz and stations in the existing band on 1600, 1590 and 1580 kHz. Additionally, nominal Class B stations in the expanded band are limited by international agreement to a maximum power of 10 kW, as opposed to the 50 kW limit for existing band Class B stations.

[14]See paragraph 38, infra, for the reasoning behind the selection of a 2 mV/m protected contour.

operate with power in excess of 5 kW (up to 50 kW), provided that all other technical criteria are met.[15] In practical terms, this would permit stations increased flexibility in tailoring station power and other characteristics to specific needs. The concerns of some commenters regarding additional interference that might result from this action are misplaced since any proposal for an increase in power would have to comply with all applicable interference provisions of the rules, as revised in this proceeding. Accordingly, our rules are revised to increase the maximum power for Class B stations, conforming our domestic rules to the international agreements to which the United States is a party and bringing U.S. stations into parity with those of other countries.[16]

B. Normally Protected Contours.

26. **Background/Proposal.** A station's normally protected contour, one of several fundamental elements of the AM station assignment criteria, defines the area within which it is desirable to promote quality service and minimize interference, insofar as possible. Technical factors governing the selection of the field strength values assigned to such contours include the minimum usable field strength and noise, both atmospheric and man-made. These contours serve as a basis for the Commission's determination of an application's acceptability. They are also important to individual stations because of their direct relationship to market value and sales price.

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[15]Class III stations must meet certain treaty obligations. The North American Regional Broadcasting Agreement (NARBA), in effect since 1959, has generally been superseded by the Rio 81 Regional Agreement, but still restricts Class III stations to a maximum power of 5 kW insofar as these stations may impact the Dominican Republic and the Bahamas Islands. The rules that we are adopting permit Class III stations to use power higher than 5 kW, while limiting radiation to not more than 5 kW toward those countries. (See Section 73.21(b)(2) of the Rules.) These provisions will continue until we are able to reach appropriate international agreements that result in the termination of NARBA with respect to the Bahamas Islands and the Dominican Republic.

[16]It is also important to note that our current power limitations may, in some cases, handicap U.S. broadcasters in dealing with international problems. For example, a U.S. Class III station is limited to 5 kW under FCC rules although classified as a "Class B" station under the Region 2 Agreement (Rio de Janeiro, 1981) which permits operation with up to 50 kW. This can result in a significant loss of service when a U.S. station operating at 5 kW receives extensive interference from a foreign station and the problem cannot be resolved through negotiations nor will the current rules permit the affected station to regain lost service through a permanent power increase above the 5 kW limit. For this reason, we also believe it beneficial to increase the power limitation of Class B stations to the higher international limit. In MM Docket No. 84-752, the FCC increased the maximum power ceiling to 50 kW for Class III stations in Alaska, Hawaii, Puerto Rico and the Virgin Islands primarily for this reason.

27. The current rules stipulate daytime groundwave protection to the 0.5 mV/m contour for all classes of stations except for Class I stations, which are protected during both the daytime and critical hours to the 0.1 mV/m contour.[17] At night, Class I stations are protected to the 0.5 mV/m-50% skywave contour as well as the 0.5 mV/m groundwave contour.[18] The other classes are protected at night as follows: Class II-A, 0.5 mV/m groundwave; Class II-B, 2.5 mV/m groundwave; Class II-C, 10.0 mV/m groundwave; and Class III, 2.5 mV/m groundwave, except where stations are limited by interference to higher values which then become the reference for protection purposes. (See footnote 11, supra). Class IV stations are not protected at night.

28. Noting the significant changes in the radio broadcasting environment during the past twenty years, and recognizing that the protected contours currently specified in our rules were developed during an earlier period consistent with policies based upon service needs of the public perceived at that time, the Inquiry asked whether, weighing the habits of today's listening public, the field strength values of these protected contours should be redefined. The overwhelming majority of commenters agreed that the contours should not be changed. Thus, in the Notice we tentatively concluded that changing these contours would not significantly improve AM service and proposed to leave them unchanged, with one exception.

29. The one minor exception to this conclusion was related to our proposal to reclassify stations and adjust nighttime protection levels accordingly. The Notice proposed to modify the baseline nighttime protection contour for Class II-A, II-B, II-C and Class III full time stations to uniformly protect the 2.0 mV/m contour.[19] This change would bring a measure of consistency to the new Class B category and would have a minimal impact on assignments, for, although we refer to this 2.0 mV/m contour as being "normally protected", stations rarely provide actual service to this contour.[20] In fact, as an inherent feature of the licensing process, most stations authorized in the past 40 years have accepted substantially greater levels of interference than that defined by the 2.0 mV/m standard. In a related matter, the Notice also proposed elimination of Section 73.37(b), which effectively is an exception to the protected contour criteria and which allows interference within the daytime 0.5 mV/m normally protected contour (up to the 1 mV/m contour) of a station that is or will be the first

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[17]The term critical hours refers to the two hours after local sunrise and the two hours before local sunset. See Section 73.187.

[18]Class I stations in Alaska are protected to the 0.1 mV/m-50% skywave contour at night.

[19]These former classes comprise the new Class B category. See paragraphs 15 to 25, supra, regarding station reclassification.

[20]See Notice at para. 44.

licensed AM station in a community.[21] No other changes to protected contours were proposed.

30. **Comments.** A number of commenters concluded that no change is needed, while a larger number suggested protection to higher values of field strength, particularly for daytime protected contours. Cohen, Dippell and Everist, P.C. (CDE) argued that higher power levels would provide better service and that the daytime normally protected contour should be changed from 0.5 mV/m to 2.0 mV/m. Others who supported the use of a higher contour level for daytime protection cited the lack of quality service in non-rural areas to the 0.5 mV/m contour. The value mentioned by virtually all these commenters as the viable protected contour was 2.0 mV/m. In their reply comments, Lahm, Suffa & Cavell, Inc. (LSC) suggested that the greater protection afforded Class I stations during daytime hours be eliminated and that they be protected at the same levels proposed for Class II and III stations.

31. Most comments favored elimination of Section 73.37(b) of the Rules or its restriction to special situations. In this regard, the National Association of Broadcasters (NAB) argued that Section 73.37(b) "fosters" and "encourages" tolerance of interference in the AM band, and this encourages the "abandonment" of AM. On the other hand, we have received comments favoring retention of the rule. The gravamen of those comments is that the rule does not cause interference and is "pro service" and as such, we should not deny an applicant the opportunity to provide or enhance a community's only local service.

32. **Discussion.** The selection of an appropriate value for the normally protected contours is central to our assignment principles. Due to the variety of physical factors governing AM signal propagation, each station faces its own unique operating situation. While it is true that the definition of normally protected contours depends heavily on several purely technical considerations (e.g., E_{min} and noise)[22] , a major element involves policy decisions that reflect goals for the AM service. In simple terms, the technical standards that directly relate to service goals are the normally protected contour, known as E_{nom}, and protection ratios. To establish wide area service and low levels of interference, E_{nom} should be low and the protection ratio should be high. In a new service there is much latitude for determining appropriate values of the technical criteria. In a mature service, such as AM broadcasting, however, virtually any change to the technical criteria impacts existing stations in some manner. Decisions we reach must necessarily take account of this fact.

33. There are four matters to resolve at this stage. They are: (1) our tentative decision to make no changes in normally protected contours daytime; (2) our tentative decision to make no changes in normally protected contours at night, except in the case of

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[21]This issue was originally raised in MM Docket No. 88-376, but was subsumed in this proceeding by the Notice.

[22]These are discussed in Section III.C., "E_{min} and Noise", paragraphs 40 to 47.

reclassification; (3) our proposal to eliminate the exception for the first AM facility in a community; and (4) the commenters' suggestion that power increases and changes to normally protected contours are the solution to the problem.

34. The proposals we made in the Notice were the result of our careful consideration of the comments in response to the Inquiry. While those comments strongly supported no change in the normally protected contours, we note that the responses to the Notice indicate a significant reversal of position.[23] That is, the commenters now want the FCC to adopt new normally protected contours that would reduce the level of protection to stations. To put this suggestion in perspective, we note that the specification of a 2 mV/m normally protected contour instead of a 0.5 mV/m contour is equivalent to a 12 dB reduction in the level of protection. The only apparent benefit realized from this reduced protection would be the added flexibility afforded stations that are currently prevented from increasing power because of the current protection criteria. It follows that other stations that had no interest in increasing power or could not do so would be subject to receiving additional interference and a loss of service area. Such a result is contrary to our goal of reducing interference in the AM service.

35. Our efforts, clearly enunciated in the Notice, are directed to an AM service that will over a period of years become increasingly free of interference and ultimately be a competitive force in the broadcast market. In reaching that goal, we see no benefit in reducing the level of protection solely because of existing interference that has been allowed to develop because of past Commission actions. Rather, we are compelled to reverse the trend of increasing interference and rely on meaningful technical principles that, if properly implemented, will lead to improved AM service.

36. The argument that many commenters make regarding the lack of service to the normally protected contour actually is strong support for our proposals to increase the levels of protection rather than to decrease them. For example, the current AM broadcast service developed on the basis of well-defined protection levels and has resulted in diminishing service over the years. Even if we were to reduce the protection levels to those suggested by the commenters, there is no guarantee that existing levels of service would remain as they are. On the contrary, our understanding of sound engineering principles makes us well aware that over time the cumulative effect of adding new stations and permitting power increases or other modifications of existing stations would result in further diminishment of the AM broadcast service.

37. Several commenters have suggested across-the-board power increases as a way of assuring reception within prescribed service contours. These comments appear to make an assumption that the increases in power can be equitably distributed across the AM spectrum

[23]Most of the responses, however, were of a general nature and contained little, if any, supporting information of a scientific nature.

so that the gains and losses would offset each other and that the benefits would be apportioned in a fair manner. This would not be the case. AM stations broadcast in a diversity of operating conditions including power, frequency, ground conductivity as well as restrictions imposed by international agreements. As a result, some stations would enjoy the benefits of service improvement at the expense of other stations operating under restricted conditions. Under these circumstances, it remains our view that power increases would achieve the unfortunate result of creating additional interference while not equitably distributing the gains and improvement in service.

38. Therefore, we find that adoption of the proposed value of 2.0 mV/m for the normally protected contour for Class II and III stations at night, as set forth in the Notice, advances the objective of improving the AM service.[24] We also conclude that modification of any other protected contour would stray significantly from the original purpose of reducing interference levels within the AM band. Since we now have a single class of station that includes the previous Class II and Class III stations, we need to pick a value suitable for protecting all of the stations in that class. A higher value, such as 5 mV/m, would expose stations currently protected to values less than 5 mV/m to more interference and a loss of service. A value of 2.0 mV/m for the normally protected nighttime contour is the highest value we can select which will preserve the service of essentially all Class II and Class III stations.

39. Additionally, Section 73.37(b), the exemption which permits a first local AM service to receive interference up to the 1.0 mV/m contour, will be deleted. We continue to believe that this rule encourages substandard operations and permits increased AM congestion and distorted service areas. Such AM operations are inconsistent with our underlying goals to revitalize the AM service and alleviate interference and congestion in the AM band.[25] On balance, we no longer believe that the establishment of a first local service automatically overrides other public interest considerations, such as the control of interference and congestion in the AM band.

C. E_{min} and Noise.

40. **Background/Proposal.** In the Notice, we briefly discussed the relationship between the minimum usable field strength, or E_{min},[26] and noise, both atmospheric and man-

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[24]See paragraph 24, supra, where we noted the overall benefits that would accrue to the AM broadcast service.

[25]For similar reasons, last year we terminated without further action MM Docket No. 88-376, which considered whether to allow stations to accept interference within the normally protected contour. See FCC 90-136 at paragraph 115, page 14.

[26]The value of E_{min} represents the minimum field strength necessary to permit a desired reception quality in the presence of atmospheric and man-made noise.

made.[27] We also discussed various Commission actions taken in the past several years which related to noise within the AM band. (See Notice, paragraphs 32 and 33.) We tentatively concluded that there was no compelling reason to revise these factors.

41. **Comments.** Several commenters expressed the belief that, under most circumstances in the United States today, our present value of E_{min} and the resultant protected contour provide interference protection to signals which are too weak to provide any meaningful quality service. Some commenters, such as Hatfield and Dawson, addressed the issue from a historical perspective, arguing that protected contour value decisions made in the 1930's could not possibly have anticipated the dramatic urbanization that occurred in the following five decades. As a consequence of this urbanization, they argue, both man-made noise and AM signal attenuation are significantly greater today, thereby necessitating higher signal strength values to provide a comparable level of service. Accordingly, many of these commenters expressed the opinion that the protected contour value should be increased to 2 mV/m.

42. A detailed discussion of E_{min} and noise was submitted by Universal Broadcasting Corporation (Universal). Based upon their analysis, Universal recommends that protection of the 0.1 mV/m contour for Class I stations, for both daytime and critical hours, be eliminated. They assert that the daytime 0.1 mV/m contour is insufficient to provide a minimum level of groundwave signal given the presence of atmospheric and man-made noise. Universal also contends that during critical hours, a station's skywave signal can interfere with its own groundwave signal, thus creating a zone of self-interference which reduces the area of effective service. Because of this, they argue, the 0.1 mV/m contour should no longer be protected for Class I stations during critical hours.

43. Other parties commented on the temporal and geographic complexities of the minimum usable field strength problem. Robert A. Jones (Jones), for example, maintains that in metropolitan areas one needs at least 2.0 mV/m to overcome noise but that in rural areas 0.5 to 1.0 mV/m is typically acceptable. Jones asserts that the presence of electrical storms may bring the value to 10 mV/m or more. Comments such as these illustrate the difficulties encountered when attempting to select a single appropriate value for E_{min}.

44. **Discussion.** We have carefully considered all of the comments submitted with respect to E_{min} and noise, and have concluded that revision of these factors is not warranted. Selection of an appropriate minimum usable field strength value is a complex matter dependent on many variables. As noted in the comments, viable minimum usable field strengths vary geographically, seasonally and even with the time of day, depending upon conditions. While it may be true that in some areas of the country, under certain

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[27]Atmospheric noise is created mainly by lightning discharges in thunderstorms. Man-made noise, found mainly in populous areas, arises from sources such as power lines, industrial machinery, ignition systems and appliances.

circumstances, the currently protected value of 0.5 mV/m is insufficient to provide an adequate signal, it is clear that in many areas, under other circumstances, it is an appropriate value. It is not evident, based upon the totality of the information before us, that selection of any other protected contour value would, on balance, provide a more accurate benchmark.

45. Similarly, we cannot conclude from the evidence presented by Universal, that the 0.1 mV/m contour is inadequate to provide Class I service. Universal's study utilized CCIR Report 322-3 (Atmospheric Radio Noise) extensively. Universal has, however, interpreted this data in a different manner than the Commission's staff. Essentially, Universal has taken into account nighttime noise levels when commenting on the minimum daytime field strength for Class I stations needed to overcome noise. We find this approach to be unpersuasive because nighttime noise levels are not relevant to daytime field strengths. Universal used the same analytical approach when considering CCIR Report 258-4 (Man-made Noise). Consequently, we do not find evidence of sufficient reliability which would allow us to conclude with certainty that Class I service does not exist in many cases out to the 0.1 mV/m protected contour and thus should not be protected.

46. The intent of critical hours protection for Class I facilities has always been to provide an adequate measure of protection to the wide area service of such stations during the transitional hours after local sunrise and before local sunset when neither daytime nor nighttime propagation characteristics are fully in effect. While there is no doubt that self-interfering skywave signals can occur during critical hours, we are unable to find based upon the information before us, that the existence of such interference renders the groundwave service totally unusable and thus not entitled to protection. The very concept of critical hours protection involves a recognition of the time dependent uncertainty of propagation characteristics of this particular period. Our experience over the years has shown that our critical hours protection scheme has successfully provided a reasonable degree of interference protection for this time of day and therefore, will remain unchanged.

47. Accordingly, the values of minimum usable field strength, E_{min}, will remain unchanged. Protection requirements for Class I facilities will also remain unchanged with respect to both daytime and critical hours protection.

D. Protection Ratios.

48. **Background/Proposal.** Co-channel and adjacent channel protection ratios prescribe the maximum permissible interference from one station to another. The level of permissible interference is always determined with reference to the protected contour as determined by applying our Rules. The value of a given protection ratio reflects a compromise between maximizing the potential quality of AM reception and the number of AM broadcast stations. The actual reception quality also depends on the bandwidth and other characteristics of the receiver employed.

49. The Notice proposed no change to the current co-channel protection ratio of 26

dB. For the first adjacent channel, the current protection ratio is 0 dB, groundwave-to-groundwave. The Notice proposed to change this ratio from 0 dB to 16 dB for the protection of daytime and nighttime groundwave service. Also, the Notice proposed that both groundwave and skywave service of Class I stations be protected from adjacent channel skywave interference. In this respect, we proposed to modify the skywave to groundwave protection ratio from -13.98 dB[28] to 16 dB and to include a skywave to skywave protection ratio of 0 dB, a type of interference protection not previously specified. For the second and third adjacent channel, the Notice proposed no change.

50. Comments. The comments overwhelmingly supported no change in the current co-channel protection ratio, although many commenters proposed to apply that ratio to a different protected contour, as described in paragraph 30 above.

51. The proposal for a change to a 16 dB adjacent channel ratio for groundwave service was supported by NAB, Association for Broadcast Engineering Standards (ABES), Tribune Broadcasting Company, Westinghouse Broadcasting Company and others. Capitol Cities/ABC, Inc. (Cap Cities) and Hatfield and Dawson proposed a ratio of 12 dB to be applied at the 2 mV/m contour (roughly equivalent to the current level of protection). CDE and Edward A. Schober, P.E. proposed 6 dB at the 0.5 mV/m contour and Vir James, P.C., Broadcast Engineering Consultants, KVI, Inc. and D.C. Williams, P.E. proposed 16 dB at the 2 mV/m contour. Many commenters opposed a protection ratio of 16 dB but did not suggest an alternative proposal. Greater Media, Inc. urged the Commission to implement increased adjacent channel protection only in the expanded band, arguing that protection ratio increases will hasten the decline of the AM radio service if applied in the existing band since more stringent protection requirements will foreclose most facility changes.

52. Regarding the proposal for 16 dB protection for nighttime groundwave service (from skywave interference), comments in opposition to the Notice proposal largely focused on the impact that such a change would have on the depiction of coverage and determination of permissible interference, with the latter impact, in their view, serving to freeze existing facilities. No comments were received on the specific subject of providing 0 dB adjacent channel protection to nighttime skywave services (from skywave interference).

53. Few comments were received on the subject of second and third adjacent channel protection. NAB stated that second and third adjacent channel protection should be considered further by the FCC's Radio Advisory Committee. General Motors Research Corporation (GMRC) and Cap Cities cited the September 14, 1990 National Radio Systems Committee (NRSC) resolution that confirms that the NRSC-2 emission standard was developed based on studies assuming that no overlap of 2 mV/m signal contours of second adjacent channel stations would be permitted, rather than the current criteria prohibiting overlap of the 2 mV/m and 25 mV/m contours. Hatfield and Dawson proposed, for the

[28]The rules refer to this in terms of a ratio of desired to undesired signals, in this case 1:5.

second adjacent channel, that no overlap of the 2 mV/m and 10 mV/m contours be permitted. Cap Cities stated that a change is required since the cost of the necessary IF filters for wide-band reception would be preclusive at the current levels of second adjacent channel protection. Cap Cities also mentioned that the NRSC-2 standard did not address the effects of third adjacent channel interference between closely spaced stations, and also called for further study of this matter by the Radio Advisory Committee.

54. **Discussion.** As stated in the Notice, the Commission intends to encourage and approve those measures which move the service in the direction of the models we have adopted to guide our considerations. We believe that appropriate decisions on the various protection ratios will move the AM service in the direction of competitive technical quality by providing a reasonable expectation that the current high levels of adjacent channel interference will be reduced through facilities modification and migration of stations to the expanded band. Such action is intended to encourage receiver manufacturers to market new wide-band receivers, so that the potential reception quality that would result from the adoption of increased adjacent channel protection may be realized over time. We note in this regard that the NRSC has adopted a Voluntary National Standard for an improved AM receiver with a 7.5 kHz bandwidth called NRSC-3.[29]

55. Regarding the co-channel protection ratio, we consider the record in this proceeding to clearly indicate that no change is required. While we agree with the comments indicating that "talk" programming requires more than 26 dB of co-channel protection, we note that, with the current level of protection, high quality reception of "talk" programming is possible beyond current city-coverage signal levels.

56. With respect to the appropriate level of first adjacent channel protection, we discuss the daytime groundwave service case first. We will continue to protect service to the normally protected contours (0.1 mV/m for Class I stations; 0.5 mV/m for other classes) and will provide increased protection required for wideband reception. However, as demonstrated in the comments, the adoption of the required 16 dB of additional protection at the normally protected contour (e.g., 0.5 mV/m) would largely preclude most needed facilities modifications, thus effectively freezing the AM band at the current level of adjacent channel interference. Nonetheless adjacent channel interference is a real concern, particularly for wide band receivers, and some improvement is needed. A pragmatic solution is suggested by the many commenters who stated that a field strength of 2 mV/m is required for satisfactory wide band reception. Since that is 12 dB greater than a normally protected groundwave contour of 0.5 mV/m, a modest increase in the adjacent channel protection ratio, applied at the 0.5 mV/m contour will serve to enhance both narrow band and wide band reception. Accordingly, we are adopting an adjacent channel protection ratio of 6 dB to be applied at the normally protected contour which will, in practice, provide 18 dB or greater protection to

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[29]See National Association of Broadcasters Comments at Appendix A, page 2. A complete text of NRSC-3 is given in NAB's comments.

wide band service. Although this is slightly higher than the 16 dB figure mentioned above, we consider this 6 dB increase in protection to be the minimum change in protection required to realize improved reception. As improved receivers are marketed with wide and narrow bandwidth capabilities, listeners will be able to realize improved and thus more competitive technical quality wherever AM improvement is achieved in practice.

57. The circumstances surrounding first adjacent channel nighttime protection are significantly different from that of the daytime. Our proposal for daytime adjacent channel protection represents a tightening of the existing protection standard contained in the rules which is applied in a single-signal manner. With the exception of protection to clear channel stations, no nighttime adjacent channel standard now exists and we are now considering the creation of a new standard. Any new standard will place restrictions on many stations where none now exist. Furthermore, this new standard will be applied in a different manner from daytime, utilizing the RSS concept of interference analysis as opposed to the single-signal approach utilized for daytime calculations. Because we are concerned about the restrictive effects of creating an entirely new adjacent channel standard for nighttime operations, we have reconsidered our initial proposal of a 16 dB value. We are persuaded by the commenters who argue that adoption of such a high ratio would impair the ability of stations to make needed facilities modifications. This is particularly so since the first adjacent channel standard represents a limitation where none previously existed. In order to maximize flexibility, and recognizing that scientific studies show that adjacent channel interference should be reduced in order to improve the AM service, we are adopting a more moderate value of 6 dB. This value is consistent with the daytime protection ratio and strikes an appropriate balance between the needs of flexibility for existing station facilities modifications and our overall desire in this proceeding to reduce the interference in the AM band as described in paragraphs 68 to 75 below.

58. Our proposal for 0 dB first adjacent channel protection to skywave service was not opposed. However, this proposal would preclude hundreds of Class B stations from making any facilities modifications because of the extremely large skywave service areas of Class A stations on adjacent channels. Therefore, we believe that this standard would be unrealistic and counterproductive and we will not extend adjacent channel protection to Class A stations' nighttime skywave service.

59. The comments have persuaded us to revise our thinking regarding the second adjacent channel protection levels. The information placed in the record by GMRC and Cap Cities regarding the basis upon which the NRSC adopted the NRSC-2 emission standard is important and relevant. However, we consider the adoption of their proposal to prohibit 2 mV/m and 2 mV/m contour overlap to be too restrictive a method of providing second adjacent channel protection. The NRSC assumed a 0 dB protection ratio in its deliberations on NRSC-2. After careful analysis, we are adopting a prohibition of overlap of the 5 mV/m contours of second adjacent channel stations. Such an action would insure that, within the daytime city coverage contours, full protection from second adjacent channel interference would be obtained. This standard would require station separations nearly identical to those

resulting from the Hatfield and Dawson proposal (no overlap of the 2 mV/m and 10 mV/m contours), and is more desirable because it is consistent with the NRSC standard.

60. No opposition was received to our Notice proposal to leave undisturbed the current third adjacent channel protection standard. We continue to believe that this standard properly balances a station's protection and service requirements. We are maintaining the existing standard of prohibiting overlap of 25 mV/m contours of such stations.

E. Nighttime Interference Calculations.[30]

61. **Background/Proposal.** According to AM broadcasters, a primary reason for their competitive disadvantage vis-a-vis FM stations is that listeners are displeased with the poor quality of AM nighttime reception. The perceived inferiority stems from a number of factors, including the abbreviated and non-corresponding areas of coverage of most nighttime AM operations relative to their daytime service areas, as well as the inherently high level of man-made and natural noise which, when combined with interfering signals from other AM operations, contribute to an overall degradation of service. Consideration of this last factor, interfering signals, has become increasingly important as the AM band has become more congested. The cumulative effect of permitting additional interfering signals, even those that are not recognized as such by the rules, unquestionably has led to a deterioration in AM service.

62. Nighttime interference calculations are performed differently depending on the class of station and related protection criteria. Two methods are used and are related to the type of protection to be afforded.[31] The first method (single signal), considers each individual signal as an interference source and evaluates its acceptability without regard to the presence of other interfering signals. This method is used to evaluate protection afforded to stations designed to provide wide area service (Class I stations) and merely requires that the values of the protected and interfering contour be known. For example, in the case of Class I protection, it is only necessary to ensure that the proposed field strength of an interfering

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[30]During the course of this proceeding, we have not proposed to alter the methodology for calculating daytime interference; and nothing in the record has persuaded us to do otherwise. Thus, in terms of methodology, we have focused only on nighttime interference.

[31]A third method is used for Class IV stations. Class IV stations, however, are unique with respect to nighttime protection in that extremely large numbers share the same channel and have no specific nighttime restrictions. Instead, they are authorized to operate based on daytime separations without regard to mutual nighttime interference. Because of these differences, there would be little benefit in applying to Class IV stations the same rules changes that are being considered for the other classes of stations. Thus, the rules we adopt regarding nighttime interference will not apply to Class IV stations except with respect to the determination of coverage.

signal at or within the Class I's 0.5 mV/m-50% protected contour does not exceed 0.025 mV/m-10%. The second method (multiple signal), considers each individual signal in conjunction with other interfering signals to determine acceptability. This method is used with respect to stations providing small to medium area coverage and is considerably more complicated.

63. The multiple signal method, used to assess the cumulative effects of skywave interference to other stations, requires calculations to be based upon the root-sum-square (RSS) of all interfering signals.[32] Currently, RSS calculations are performed using a "50% exclusion method" which limits the number of interfering signals that must be taken into account.[33] Because the exclusion method ignores lesser interfering signals, as new stations are added or existing stations make modifications, the cumulative effects of the excluded interference contributions can, over time, substantially increase the disparity between the true RSS and the RSS calculated using the 50% exclusion method.[34] Except for protection to Class I stations, adjacent channel skywave signals are not considered in the interference calculations.

64. Adjacent channel nighttime protection is currently provided only to Class I stations at their 0.5 mV/m nighttime groundwave (primary service) contours. This requires a first adjacent channel Class II station to restrict its field strength at any point on the Class I protected contour to a value of 2.5 mV/m-10%. For other classes of stations, the present rules do not consider the presence of adjacent channel skywave signals or provide for protection among them.

65. The current method of determining nighttime interference as described above was adopted many years ago to provide for orderly development of the AM broadcast service. The number of stations grew but at the expense of incremental increases in actual interference. In the Inquiry, therefore, we questioned whether it would be appropriate to limit increased interference from other stations by considering adjacent channel nighttime skywave

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[32] See Section 73.182 of the Rules. The RSS is a mathematical procedure which involves taking the square-root of the sum of the squares of interfering signals. This is often referred to as the E_u for the subject station and represents the usable field strength for the station in the presence of interference from other stations. It is used for both interference and coverage purposes. The FCC rules require that the normally protected contour, E_{nom}, or the E_u be protected from interference, whichever is greater.

[33] This method incorporates a procedure for determining what interfering signals may be disregarded. Ignoring sources of interference facilitates the implementation of new or modified nighttime operations and minimizes the number of calculations required. This latter point, a major consideration at the time this method was formulated, is no longer relevant with the advent of inexpensive computers and comprehensive databases.

[34] An illustration of this is included in Appendix C.

interference in the RSS calculations and by reducing the RSS exclusion value from 50% to 25%. The reaction was mixed but generally construed our stated alternatives to be an insufficient response to the considerable difficulties facing the AM service.

66. In view of the response to the Inquiry, the Notice proposed even tighter protection criteria. We proposed to eliminate entirely the RSS "50% exclusion" methodology and to consider, instead, all signals as potential sources of interference.[35] Also, we proposed to consider adjacent channel signals in the interference calculations. We further proposed that each station's individual limitation toward any other station not exceed 1.0 mV/m, with appropriate adjustments for protecting skywave service of Class I stations. Additionally, we proposed to require existing stations that already exceeded this 1 mV/m threshold to reduce their signal to other stations by 10% in order to receive an authorization to modify their facilities. Finally, although no longer required for determination of station protection under our proposal, we proposed that RSS calculations (0% exclusion) would be used to evaluate city coverage of a station and to compute the ranking factor for migration preference purposes.

67. **Comments.** Commenters generally opposed the use of the new methods, citing the resultant lack of flexibility for stations to make any necessary changes or to upgrade. Those who opposed the RSS 0% exclusion proposal noted the resultant diminution of service area when currently ignored interference contributions are included in the RSS calculation. A number of these comments recommended as an alternative that RSS calculations be performed using the RSS 25% exclusion method. A dozen commenters opposed the RSS 0% exclusion proposal, while 26 commenters registered their opposition to the concept of 10% signal reduction. Those who supported our proposals generally requested some degree of flexibility for situations involving circumstances that are beyond the control of the licensee. While there was support for an adjacent channel protection standard, there was general reluctance to commit to any specific value at this time. The comments also referred to natural and man-made noise as the preponderant factor governing nighttime interference instead of signals emanating from other operations. However, no significant new data to support this view was supplied by those commenters.

68. **Discussion.** Our review of the record convinces us that the proposals we made are sound, reflect the best predictors of interference and service available today, and provide a mechanism to not only prevent continually increasing interference in the existing AM band but also reduce, in some cases, existing levels of interference. Two of our proposals are fundamental to our efforts to improve AM nighttime interference calculations. They are RSS 0% exclusion and inclusion of adjacent channel signals. It is noteworthy that the record supports these concepts. The disagreement is not with the concepts themselves but rather with the impact of their application, most notably the lack of flexibility and reduced coverage showings.

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[35]In effect, we proposed to use an RSS "0% exclusion" method.

69. After further evaluation of the proposals, we recognize that a key element of our proposals, the shift to the single signal protection concept, is also most difficult to achieve without impacting the ability of some existing stations to modify their operations. As stated in the Notice, such a shift (to a lower value e.g., 1 mV/m) would have the benefit of potentially reducing interference in the AM band. It also would simplify the interference calculation. We agree with commenters, however, that the threshold level of 1 mV/m for protection purposes may be ideal but in many instances it is impractical. For example, a station limited to a high RSS (e.g., 20 mV/m) is not significantly impacted by another station that raises its contribution slightly above the threshold of 1 mV/m.[36] The ultimate question is what is the test for significance for these types of situations. We find that a major difficulty inherent in the proposed rules relates to the need to find a specific value that would define interference as significant and trigger the need for a 10% reduction in signal level. We have concluded that in a mature band such as the AM band, a single value that would represent a significant increase in interference is extremely elusive because of the many various combinations that require consideration. Also, we are not convinced that the discovery of a single value would be translated into tangible benefits since the concept requires voluntary actions of stations (i.e., facilities modifications), the type and quantity of which cannot be predicted, as a prerequisite for a 10% signal reduction. Thus, we are adopting a modified proposal that incorporates the basic ideas and adjusts the remaining ones.

70. The modified approach we have developed adheres to our basic goal of improving the AM service by reducing or restricting increased interference. Although the interference reducing benefits of the modified approach are not as pronounced as our original proposals, they are still directed to our overall goal while accommodating several of the concerns of the commenters. In effect, it provides a balance between the ideal and the pragmatic. The modified approach we adopt is as follows. In the determination of nighttime interference, all skywave signals (co-channel and first adjacent channel) are considered.[37] The single signal concept is replaced with an RSS concept that distinguishes between three significant levels of interference. First, the highest interferers are those that contribute to another station's RSS (50% exclusion); these interferers would be required to reduce their contribution to that RSS by 10% if and when they apply for a change in facilities.[38] Second, the next level of interferers are those that contribute to the RSS (25% exclusion) but not the RSS (50% exclusion); these stations would be authorized facilities changes if no increase in radiation is involved. Finally, the lowest level of interferers are those that are no greater than the RSS

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[36]See Appendix C.

[37]The method of considering first adjacent channel skywave interference, a heretofore ignored contribution, is to be accomplished in much the same way as co-channel contributions, except that each limit will be evaluated after applying a 6 dB weighting factor to the radiated signal (as opposed to the 26 dB factor used for co-channel signals).

[38]It is noted that a 10% reduction in the contribution to an RSS requires a 10% reduction in radiation at the appropriate vertical angle.

(25% exclusion) and which would be permitted to increase radiation as long as the RSS (25% exclusion) threshold is not equalled or exceeded. Essentially, we have used the well-known RSS method with 50% and 25% exclusion values to classify existing co-channel and adjacent channel stations as high, medium and low interferers. High interferers must reduce interference, medium interferers may preserve the status quo, and low interferers may make modest changes. Finally, a new station may be authorized only if it qualifies as a low interferer with respect to any other station on the same or first adjacent channel.

71. We turn now to relevant concerns of the commenters and the impact of our modified approach. Three points stand out - flexibility, coverage, and noise. Of the three, flexibility is the most difficult to resolve because it requires a balance between our overall goal of reducing interference in the AM service and the understandable desire of broadcasters to improve their stations. The balance is delicate because as interference restrictions increase, flexibility decreases. Recognizing that our proposed rules would severely limit station modifications, we note that the modified approach relaxes the restrictions and is not as limiting. We believe that this action may satisfy some of the commenters concern. Moreover, we are aware that often licensees are required to make changes to their stations because of circumstances beyond their control (e.g., loss of site and antenna maintenance difficulties).[39] Under those circumstances, we would take a close look at the facts presented and rule on the appropriateness of a waiver, just as is available under the current standards. For these reasons, we believe the rules we adopt today provide an appropriate balance between two desirable but conflicting needs.

72. With respect to coverage, considerable opposition to the revised RSS approach focused on the resultant reduction of predicted nighttime service which would occur when calculating new interference-free contour values for coverage purposes. It is obvious that inclusion of additional co-channel and adjacent channel contributions would increase calculated RSS values. At the same time we recognize that a reduction in coverage, even if theoretical rather than actual, translates into an apparently reduced market and possibly reduced revenue for AM licensees. While we believe it would be proper to adopt this more accurate calculation technique, we recognize the merit in not including all signals in the RSS calculations since no convincing evidence has been presented to warrant a substantial alteration of the currently practiced method of coverage prediction.

73. Including first adjacent channel signals in the RSS calculations and incorporating

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[39]We also recognize that certain circumstances that may be beyond the control of the licensee would prevent a 10% reduction because of a conflict with other Commission rules, such as those requiring compliance with minimum efficiency criteria or where specification of the standard pattern "Q" factors would not achieve proper tolerance. See 47 CFR, Section 73.150. In such situations the Commission would allow, on a case-by-case basis, for some flexibility for exceptional cases where reduction could not be performed without the waiver of other technical requirements.

the new skywave propagation model, will change virtually all nighttime interference-free contour values. Consequently, corresponding coverage maps will also change. As we are maintaining a 50% exclusion for the RSS calculation, the coverage depictions for many stations should not be altered dramatically from those which existed under the previous standards. Therefore, we shall not impose any requirement for a universal re-mapping of service contours. This will be left to the discretion of the individual licensee, or until such time as an application is filed for change in facilities which would itself alter the station's service area.

74. The only exception to use of the RSS with 50% exclusion for coverage purposes is the determination of an improvement factor for a station seeking to migrate to the expanded band. Because there is a need to distinguish between all stations with respect to interference caused and received, an impossibility using a 50% exclusion method, and because the practical problems associated with a reduced coverage depiction will be neither relatively significant nor relevant to the improvement factor process, the 0% exclusion method will be utilized within the context of the expanded band migration eligibility calculations.

75. Finally, with regard to noise, we agree that noise is certainly a factor which warrants consideration; however, based on the record of this proceeding, we are not persuaded that interfering signals from other stations are less significant than ambient noise in the evaluation of the overall problem. Therefore, any solution which concentrates primarily on overcoming local noise thresholds, such as universal power increases, can only serve to exacerbate the existing problem by also raising the base interference level.

F. Nighttime Enhancement.

76. **Background/Proposal.** Recognizing that daytime-only stations face serious disadvantages because of their inability to operate at night, the Commission has initiated several rulemaking proceedings that addressed this limitation on station operation and sought ways to permit fulltime operation to the maximum extent possible consistent with sound engineering practice. Significantly, actions taken in a series of proceedings have allowed many daytime-only stations to operate during nighttime hours.

77. Specifically, by Commission action taken in MM Docket No. 87-131, Class II and Class III daytime-only stations were individually authorized to operate at night with power levels that the Commission determined would avoid the creation of new interference. These stations were generally reclassified as Class II-S and Class III-S stations. The Commission granted this relief for daytime-only stations while focusing on the need for complete protection of existing fulltime licensed operations. Stations operating under such authority were not protected from existing nighttime operations, from each other, or from any future nighttime operation that proposed full nighttime facilities. For such stations, the permissible power level, a function of the interference protection restrictions, was calculated based on the daytime or, if applicable, the critical hours antenna systems of the daytime-only stations. Class II-S and Class III-S stations which were authorized power levels which met or exceeded

the minimum radiation value for a full nighttime operation (i.e., 141 mV/m at 1 km) were subsequently upgraded to primary status and were afforded the benefits of full protection.

78. In MM Docket No. 88-509, we proposed further steps to enhance the opportunity for daytime-only stations to improve their nighttime operations while at the same time maintaining existing interference protection requirements. The Notice observed the close relationship between the MM Docket No. 88-509 issues and those considered herein and concluded that the issues and record should be incorporated in this proceeding. Notice at paragraph 24.

79. In essence, therefore, the Notice, in accordance with MM Docket No. 88-509, proposed the relaxation of current restrictions that prohibit Class II-S and Class III-S stations from establishing separate nighttime antenna systems and upgrading their nighttime operations to facilities that do not meet the minimum protected power level of 250 watts (or the equivalent 141 mV/m at 1 km). The proposal, for example, would allow, on a non-interfering basis, a station with a relatively low nighttime power, such as 30 watts, to increase to a higher value, such as 80 watts, by using an antenna configuration different from its daytime system, something not presently permitted unless at least 250 watts is requested. Also proposed were changes to requirements regarding minimum power, city coverage or minimum operating schedule. Proposed also in MM Docket No. 88-509 was the option of defining all such nighttime enhancement proposals as "minor changes" - even those requesting power increases.

80. Finally, we proposed that unlimited-time Class II and Class III stations be allowed to reduce their nighttime power to a level below the established minimum and thus be reclassified as Class II-S or Class III-S stations. Under these circumstances, we reasoned that such stations would lose their rights to interference protection and that city coverage and minimum operating schedule requirements would be retained for stations which elect to make these voluntary power reductions. Comment, however, was sought on exempting such stations from the coverage requirements.

81. **Comments.** In response to the Notice, few comments were received specifically addressing the nighttime enhancement issue for daytimers. CBS, however, did suggest that any enhancement request be restricted to a maximum power ceiling of 250 watts. Two other commenters, KLOK and KQV, opposed the proposal, while Alabama Native American Broadcasting supported the use of separate day and night antenna systems. Those comments received in direct response to MM Docket No. 88-509 were generally favorable. Most agreed that existing Commission Rules that prevent Class II-S and Class III-S stations from increasing nighttime power from originally authorized levels to levels below 250 watts coupled with the required use of existing daytime antenna sites and systems for nighttime operations constitute burdensome restraints on night operations. Most parties also agreed that the proposals to remove these constraints were sufficient to significantly increase the operational flexibility needed by such stations to improve the efficiency and competitiveness of their nighttime operations.

82. With regard to the minor change filing procedures, those who supported such processing did so because they felt major change procedures would be too cumbersome, too complex and too financially burdensome. Others contended that major change processing would deter station operators from seeking enhancements in order to avoid the risk generally inherent in such processing procedures, namely the possibility of contending with competing applicants. Those in support of major change processing stated that it was necessary so that unlimited-time stations who anticipated interference would have ample time and opportunity to make independent assessments of the engineering statements filed in support of the proposed enhancements. Some commenters stated that some opponents of a proposed enhancement application might take advantage of the petition to deny procedure that is available under major change processing regulations.

83. There was overall support for the proposal to permit stations to downgrade from fulltime Class II and Class III operating status to Class II-S and Class III-S. However, despite the consensus favoring such reclassification, commenters disagreed on the city coverage, operating hours and interference protection issues. A majority of the parties who commented on the city coverage issue opposed imposition of that requirement on reclassified stations. Also, most parties who addressed the operating hours requirement, opposed requiring reclassified stations to operate for minimum number of hours. With respect to the interference protection issue, most commenters opposed providing interference protection to reclassified stations.

84. **Discussion.** After thorough review of this matter, we will adopt changes in the current rules to facilitate both the technical enhancement of nighttime operations by Class II-S and Class III-S stations and the overall improvement of service to the listening public. We will also permit those unlimited-time Class II and Class III stations, that find it advantageous to do so, to reclassify their nighttime operations as Class II-S and Class III-S and to operate under the same terms as existing Class II-S and III-S stations. We believe that these changes will aid in our overall effort to permit daytime-only stations the opportunity to provide meaningful nighttime service and to provide added flexibility to fulltime stations who are suffering economic difficulties.

85. With regard to enhanced nighttime operations for Class II-S and III-S stations, we will now permit such stations to increase their nighttime power from the level originally authorized to any intermediate level below 250 watts (or the 141 mV/m at 1 km radiation equivalent). We will also permit such stations, when they are operating below the 250-watt level (141 mV/m at 1 km), to use operating parameters which differ from their daytime antenna values and to operate these new systems at either their existing daytime or at new nighttime sites.

86. Our decision to make these rule changes is further supported by our recognition of certain infirmities of the current restrictions applied to Class II-S and Class III-S operations. Since the authorizations were issued on a strictly non-interfering basis, in many cases the authorized powers are too low, their antenna sites are too distant from their

communities of license, and their antenna systems are designed specifically for the technical requirements of daytime operation without regard to possible nighttime operation. Thus, in many instances, stations have elected to not use their nighttime authorizations. Our actions in this area reflect an awareness that further steps were needed to remove constraints on these stations and to thereby enable them to improve their nighttime operations and provide better service to their listening audience, while at the same time maintaining interference protection to unlimited-time stations.

87. Further, we have decided that applications filed by stations seeking to implement enhancement proposals will be processed as minor changes under Section 73.3571(a)(2) of the Rules. Section 73.3571(a)(1) of the Rules defines "major change" applications as those that propose an increase in power, or a change in frequency, hours of operation or station location. The only definition in that section that is relevant to these proposals is the one regarding an increase in power. Since, unlike most other power increases defined as major changes, these proposals would typically involve only a modest increment in power for what is essentially a secondary nighttime service, we believe that such changes should be classified as minor changes. Moreover, as relatively low power, secondary operations, no preclusion to other stations could occur, and service provided by these stations would be limited and would not be subject to protection from fulltime stations, providing relatively little, if any, increase in service beyond the community of license. As a result, the concepts embodied in our major change processing procedures would not be applicable and could result in unnecessarily delaying improvements to these stations. This action does not alter the basic right of parties to file informal objections under the minor change processing procedures nor does it diminish Commission scrutiny since the engineering analysis applied to major and minor change applications is essentially the same.

88. We will also permit unlimited-time Class II and Class III stations to reclassify their nighttime operations as Class II-S and Class III-S stations and to operate below 250 watts (141 mV/m at 1 km equivalent) under the same terms as existing Class II-S and Class III-S stations. Since AM applications for power reduction are currently treated as minor change applications, it would be logical to extend that treatment to these cases. Thus, such applications will be processed as minor changes under Section 73.3571(a)(2) of the Rules. These stations will receive no protection from interference, will be required to provide protection to unlimited-time stations, and will be exempt from meeting nighttime city coverage and minimum operating schedule requirements.

89. Additionally, we will permit Class II-S or Class III-S stations to use rooftop or other unconventional antenna systems at night. Such stations may benefit from using inexpensive, short, and easily mounted antennas which are cost-effective and may promote expedited nighttime service. However, we will not compromise the efficacy of our interference reduction efforts for this purpose and therefore, will require detailed engineering showings to accompany any application where such an antenna is proposed as well as a subsequent proof-of-performance demonstrating proper system operation.

G. Advanced Antenna.

90. **Background/Proposal.** The Notice observed that the NAB was conducting tests on new types of antenna systems that might improve the AM broadcast service. We proposed to defer changes in the rules until testing and analysis of such systems had been completed.

91. **Comments.** Few substantive comments were received on the topic of advanced antennas other than from the NAB, which submitted detailed studies describing two separate antenna testing programs - the skywave suppression antenna and the low profile antenna. The results of the skywave suppression project revealed that the system would not provide a consistent reduction in skywave interference. However, according to the NAB study, the low profile antenna showed some promise.[40] The NAB urged that we adopt rule changes that would allow testing and use of standardized low profile antennas even though they do not meet current FCC minimum efficiency limits.

92. **Discussion.** Initially, we commend the NAB and others for their continuing efforts directed at the development of improved antenna systems for use in the AM band. We encourage the continuation of these and other related antenna projects which show promise for the improvement of this service.

93. At issue is whether it is appropriate at this time to revise our rules in order to accommodate standardized versions of either or both of the antenna systems described above for use in the AM service. As noted in the comments, results of the skywave suppression antenna have been inconsistent and we believe no further Commission action is warranted at this time. Results of the low profile antenna are more encouraging. However, Commission action on the low profile antenna at this juncture would be premature since it would be based upon a limited record of actual field test data. Accordingly, we encourage further testing of this antenna design and to the extent possible, we intend to give favorable consideration on a case-by-case basis to any requests which might help develop the record of actual field test data. Commission action on a standardized version of the low profile antenna will be deferred pending the development and analysis of such a record.

H. Split Frequency Operations.

94. **Background/Proposal.** Split frequency operations utilize one assigned carrier frequency during daytime hours and a second carrier frequency during nighttime hours of operation. Such operations could be attractive to daytime-only stations which are unable, due to technical restrictions, to use their daytime frequency for nighttime operation, as well as to new fulltime stations which cannot find a viable single channel for both modes of operation. We have interpreted our Rules as not permitting split frequency operation, although in one

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[40]The low profile antenna is a physically small, free standing structure with a minimal ground system.

case we granted a waiver to permit such operation. Birach Broadcasting, 4 FCC Rcd 4461 (1989).

95. Split frequency operations are generally considered to be spectrally inefficient. Unless the two frequencies to be used are within close proximity to each other, the preclusion by split frequency operations involves as many as 14 different frequencies as opposed to the 7 frequencies (one co-channel and six adjacent) where preclusion occurs for a typical single channel operation. The difficulties extend to the listenership as well, since the audience is forced to re-tune their receivers at sunrise and sunset to preserve a continuous programming source. In view of this, the Notice proposed the elimination of this particular form of operation.

96. **Comments.** Most comments addressing this subject agreed that further authorizations of this type of operation would not be desirable and that each station should be required to use the same frequency during day and night hours of operation. However, E. Harold Munn opposed our dismissal of this form of operation, stating that it could be a useful tool for providing additional service when used in the proper circumstances. Schober also encouraged split frequency use on a case-by-case basis.

97. **Discussion.** Because of the greater level of complexity of split frequency operations and the potential for increased preclusion of other conventional facilities, split frequency operations should generally be disfavored. However, we do agree with those commenters that under very special and unique circumstances, the public service arguments for authorizing such an operation may outweigh the aforementioned liabilities. We will consider waiver requests where sufficient supporting technical information is submitted to establish that no preclusion to other full time stations would occur, and that the greater public interest can be achieved through issuance of such an operating authority. Nevertheless, we do not agree that adequate justification exists to create a separate body of rules to govern such operation. Therefore, we are amending Section 73.3516 of the Rules to more clearly exclude split frequency operations.

I. Summary of Technical Standards.

98. In this section, we have (1) adopted new first and second adjacent channel protection standards, (2) revised nighttime coverage and interference calculations, (3) allowed possible enhancement of nighttime service by certain Class D stations and most importantly, (4) adopted a rule that would reduce interference to some stations when certain facilities modifications are authorized. As a group, these rules should lead to a significant, although gradual improvement in AM signal quality.

IV. Migration to the Expanded Band

99. The second element of our plan for improving the AM service is the selective

migration of existing AM stations into the expanded band. This migration offers a unique opportunity for the improvement of AM broadcasting. By adopting appropriate rules for the use of the expanded band, migrating stations will operate in a new environment where Model I service should be achievable by all stations.[41] Furthermore, after the completion of the migration process, there should be a general reduction in interference levels in the existing band, helping achieve the goal of Model II service for existing stations.[42] These changes should benefit all licensees and the public as a whole, as the quality and perception of the AM service improves. However, the extent of improvement depends, in part, upon the selectivity of the migration process. Migration of AM stations from the existing band should reduce interference and congestion in the existing band and should offer a prompt method for establishing service in the expanded band. We now consider the various issues that must be resolved in order to accomplish these goals.

100. In this section, we address the many issues related to the migration process. They are: (1) wide station separations and low interference levels; (2) migration eligibility; (3) existing stations causing interference and preferred migrators; (4) allotment or assignment options; (5) sample allotment plan; (6) the selection process for migrating stations; (7) ownership limitations and transition period; (8) expanded band technical standards; and (9) city coverage for expanded band stations.

A. Wide Station Separations and Low Interference Levels.

101. **Background/Proposal.** Migration of AM stations from the existing band into the expanded band is a fundamental feature of our plan for AM improvement. In the Notice, we expressed our preference for an expanded band environment which would utilize relatively wide spacings between stations to produce reasonably low interference levels. We also expressed our initial reservations regarding the use of elaborate multi-tower directional antenna systems in the expanded band, stating instead our preference for nondirectional or simple directional antenna systems. In this regard, we discussed the appropriateness of the characteristics of the Model I facility for the expanded band. Consistent with this Model I definition, we made a preliminary estimate that 25 to 30 stations per channel could be accommodated in the expanded band.

102. **Comments.** Commenters were supportive of many of the idealized characteristics proposed in the Notice for stations migrating to the expanded band. Most agreed, for example, that fulltime service should be an essential feature for the expanded

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[41]Model I station features include fulltime operation with stereo, competitive technical quality, 10 kW daytime power, 1 kW nighttime power, non-directional antenna (or simple directional), and 400-800 km spacing between co-channel stations.

[42]Model II station features include fulltime operation, competitive technical quality, wide area daytime coverage with nighttime coverage at least 15% of daytime coverage.

band. E. Harold Munn Jr. and Associates (Munn) took issue with the proposed power limitations for the expanded band, arguing that the minimum nighttime power should be reduced to 250 watts in order to maintain flexibility. Munn contends that this would permit the use of simpler directional antennas. Other commenters urged that we allow higher power levels in the expanded band to compensate for the poorer propagation characteristics of these higher frequencies. Several parties argued that the use of directional antennas would be necessary for efficient utilization of the expanded band and that we should not discourage or limit their use. Other commenters contend that, in addition to the Model I characteristics listed, we should specify minimum tower height requirements for the expanded band to reduce skywave components and enhance efficiency.

103. A few parties expressed the belief that the proposed expanded band Model I technical parameters would not produce results consistent with the stated goals in terms of coverage areas, nighttime interference free contours and number of stations per channel. Cohen, Dippell and Everist submitted an analysis to demonstrate that instead of 25 to 30 stations per channel, as mentioned in the Notice, their calculations show "approximately 5 (certainly less than 10)" stations can be assigned per channel.[43] This study was based on an assumption that all stations on a channel would be protected at night to their 2 mV/m contours. Lahm, Suffa and Cavell and duTreil, Lundin and Rackley submitted related analyses demonstrating that based upon proposed spacings and non-directional antennas, nighttime limits would be higher than anticipated in the Notice, ranging from 6.4 mV/m to 17.3 mV/m. This would result in smaller nighttime service areas than contemplated in the Notice, they contend. Although the specifics of these studies disagree somewhat, due to differing assumptions, their conclusion generally is that the Model I technical parameters are not consistent with the service goals articulated in the Notice.

104. **Discussion.** One of our goals in this proceeding is to create an expanded band environment with relatively wide station separations which would result in reasonably low interference levels. We continue to believe that adherence to carefully crafted expanded band characteristics, such as the Model I parameters, is essential to accomplish this goal. For example, use of significantly lower nighttime power than the proposed 1 kW level would result in smaller nighttime service areas. Similarly, complex multi-tower directional antenna systems which produce irregularly shaped service areas are not consistent with our overall coverage ideals. Use of non-directional or simple directional antenna systems prevents the problems associated with the "shoehorning" of stations which are common in the existing band. The suggestion of some commenters that power levels greater than 10 kW be allowed is not a viable option since the maximum power is restricted to that value by international treaty obligations. Additionally, we do not believe that specifying a physical tower height minimum for the expanded band, as suggested by a few commenters, is necessary since minimum efficiency requirements are sufficient to preclude the use of physically short antenna systems.

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[43]See Cohen, Dippell and Everist, P.C. comments at 28.

105. The parties that maintained that our Model I technical characteristics are not consistent with our service goals base their arguments on studies that assumed that our desired value for E_{nom} was to be used as the value for the nighttime interference-free contour and protected accordingly. Interference prevention in the expanded band will be based upon the station separations of the allotment plan rather than a requirement for case-by-case protection of a nighttime interference free contour as is used in the existing band. Our initial calculations performed at the time of the Notice yielded predicted nighttime RSS values considerably higher than 2.0 mV/m. Our initial estimate of 25 to 30 stations per expanded band channel was intended to represent the potential upper limit of the number of stations that could be accommodated per channel. Clearly, this estimate was made in an environment of considerable uncertainty with regard to many pertinent parameters. It was never our intention that the 25 to 30 station per channel estimate be viewed as a specific primary goal for the expanded band to which other considerations would be subordinate.[44]

106. While we will require expanded band operations to use at least Model I parameters, there may be special cases which warrant the authorization of other than Model I parameters. In such situations, the protection to be afforded co-channel and first adjacent channel allotments from skywave and groundwave interference in any part of an allotment area shall be equivalent to the protection afforded by Model I facilities implementing the designated allotment and will be determined on a case-by-case basis.

107. An example of a variation from our general concepts relates to the potential for allotments to be located in coastal areas. In such situations, it may be appropriate to space allotments at shorter distance intervals and to specify a simple directional antenna system (2 or 3 towers) in order to provide full protection to all stations. We do not anticipate drastic short-spacing of facilities which would require deep directional pattern nulls, but rather moderate degrees of suppression to compensate for marginally short-spaced allotments. This flexible approach offers at least two benefits. First, it could possibly satisfy migration demands that would be otherwise be prohibited. Second, it could allow stations to operate with power greater than 1 kW, an attractive option for stations located in coastal urban areas. With proper design, a system could be developed that would provide equivalent protection and yet provide significantly increased service areas. In situations such as these, where a major lobe of the pattern could be directed out to sea, with no potential for interference, consideration could be given, on a case-by-case basis, to the possibility of 10 kW nighttime power.

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[44]In developing the sample allotment plan, we have found our initial estimates of the capacity of the expanded band to be somewhat high. Due to a number of reasons, including changes in our initial approach and the locations of stations submitting letters of intent, the expanded band capacity appears to be less than we estimated. A precise figure for the capacity of the expanded band is not available because of the flexible approach that we plan to use in creating the allotment plan. For a complete discussion of the sample plan, see paragraphs 130 to 134, and Appendix D.

B. Migration Eligibility.

108. **Background/Proposal.** The Notice proposed to limit initial eligibility to occupy the expanded band to existing stations. The objectives of such migrations are to reduce interference and congestion in the existing band, and provide an expeditious means of establishing service in the expanded band. In the Notice, we tentatively concluded that the public interest would be best served by using the expanded band to improve the overall quality of the AM service by lessening interference and congestion in the existing band. The Notice also observed that reserving channels in the expanded band for minorities, women and/or public radio would not be consistent with the public interest objectives of reducing interference and congestion and improving technical quality in the existing AM band.

109. **Comments.** The comments overwhelmingly supported our proposal to initially preclude new applicants from applying for channels in the expanded band. NAB, reflecting the majority of commenters, asserted that the limitation of eligibility to existing stations would assure reduction of interference in the conventional band and concurred in our preliminary view that the Commission has the legal authority to impose such a limitation. However, we received comments from several parties, in particular Multilingual Communications Association and Global Broadcasting System, Inc., opposing any proposal that would restrict minorities and women from applying for channels in the expanded band. These same commenters also suggested that channels be set aside for minorities and women. In a similar vein, NPR, Bellevue School District and Wright State University suggested that channels be set aside for public radio.

110. **Discussion.** We will restrict initial eligibility for expanded band allotments to existing AM licensees.[45] We are convinced that such a restriction is essential if we are to achieve the level of interference and congestion reduction in the existing band which might revitalize its competitive standing. There are only ten expanded band channels and the loading restrictions placed on these channels by the wide separations and stricter technical requirements necessary to ensure quality service are substantial. Indeed, as our sample allotment plan demonstrates, the band will likely accommodate fewer than 200 of the nearly 5000 existing band stations. Under these circumstances, we must strictly manage migration to maximize the interference and congestion reduction benefits of each allotment awarded.[46]

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[45]As stated in paragraph 6 above, our action here initially restricting eligibility for expanded band authorizations to existing AM licensees is intended to redress the unique technical problems present in the AM service. It should not be taken to suggest any generalized Commission policy favoring existing licensees over new entrants in other services where new or expanded opportunities may arise. The Commission remains fully committed to our diversity goal of providing opportunities for diverse voices in local communities.

[46]The Notice did not propose to include Class IV stations as eligible migrators. The record in this proceeding has not persuaded us to alter our position. Class IV stations are intended to

Permitting new applicants, whose use of an expanded band channel would contribute nothing to reducing interference or congestion, is simply inconsistent with these requirements.[47]

111. Minority, female or education service set-asides in the expanded band pose similar difficulties. Because applicants in these categories would also be new entrants rather than existing AM broadcasters, reserving even one channel for their exclusive use would assure a 10% decrease in expanded band resources dedicated to interference and congestion reduction. Moreover, because the locations of stations on any set-aside channel would restrict the sites of stations on adjacent channels, a single channel set-aside would impose additional restraints on our flexibility beyond the initial 10% reduction in expanded band capacity which it necessarily involves. In sum, given the level of interference and congestion in the existing band and the significant constraints imposed by quality considerations on the expanded band's capacity, we do not believe set-asides or reservations for applicants which will not contribute to the improvement of existing band conditions are feasible at this time.

112. We recognize, of course, that increasing the levels of minority and female ownership promotes diversity and therefore advances the public interest. We also recognize that in some areas there may be a desire for additional public radio outlets and that existing spectrum in the FM band may not be sufficient to fulfill that desire. The difficult choices we make here do not suggest any diminished concern on our part for the benefits which our existing minority and female preference policies and educational reservations have long provided. Rather, they reflect the hard reality that overall AM improvement will require all

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provide local service to relatively small communities without regard to either service or interference beyond their immediate service areas. There are approximately 1,300 Class IV stations assigned to the six local channels. These stations are, in most circumstances, operating at a power of one kilowatt, day and night, without consideration of interference to other Class IV stations. We have received 54 letters of intent from Class IV stations expressing a desire to migrate to the expanded band. Even if all 54 of these stations were to migrate to the expanded band, we continue to believe that relatively little, if any, overall improvement in AM reception would result. It is also our view that the record in this proceeding does not establish that the migration of Class IV stations would significantly reduce overall interference caused to adjacent channel Class III stations.

[47]Consistent with Ashbacker Radio Corporation v. FCC, 326 U.S. 327, 333 n.9 (1945) and United States v. Storer Broadcasting Co., 351 U.S. 192 (1956), we are permitted to restrict initial migration eligibility to existing AM stations. In Ashbacker, the Supreme Court held that the Commission is required under Section 309 of the Communications Act to give comparative consideration to all bona fide mutually exclusive applications. In so holding, the Court did not preclude the Commission from establishing threshold qualifications that must be met before applicants are entitled to comparative consideration. Subsequently, in Storer, the Court held that in the context of a rule making proceeding, the Commission may establish standards that applicants must meet in order to receive comparative consideration.

available resources. We note, of course, that to the extent initial migration to the expanded band does not exhaust its capacity, new applicants, including noncommercial educational parties, and minority and female applicants whose comparative preferences would be fully effective, will have an opportunity to seek authorizations.

C. Existing Stations Causing Interference and Preferred Migrators.

113. **Background/Proposal.** While limiting migration explicitly to current AM licensees broadly addresses the problem of congestion in the existing band, our improvement efforts would be even more effective if eligibility were further focused to encourage the heaviest contributors of interference among existing licensees to migrate. Therefore, the next issue is whether existing stations causing interference should be preferred migrators to the expanded band. Related to this is the recognition that the AM band contains many diverse types of operations, some of which cause or receive varying amounts of interference during different periods of operation and would realistically provide varying benefits if they were to migrate to the expanded band. Thus, to create the regulatory framework that would offer the greatest hope for AM improvement, there is a need to establish a system of preferences within the broader group of those stations eligible to migrate.

114. The Notice proposed that existing fulltime licensees who would most reduce interference and congestion by moving to the expanded band should be preferred applicants for slots in that band. If no fulltime station asked for a particular channel in a given area, the next priority would go to daytime stations located within the 0.5 mV/m-50% skywave contours of Class A stations and which are licensed to serve communities of 100,000 or more that currently lack a local fulltime aural service. Next priority would go to other daytime-only stations that under current rules cannot operate at night. Finally, for the remaining daytime-only stations we proposed that the ranking would be based on power calculated in accordance with current Section 73.182 of the rules, with stations to be ranked in order of least to most power output.

115. **Comments.** Comments on our proposal to encourage migration of existing stations causing the most interference were mixed. NAB argued that daytime interference should be a preference factor and supported relief for daytimers in the expanded band. Additionally, although expressing general support for the proposal, NAB believed we should give migration preferences to remedy intermodulation problems that occur in some of the newer digital receivers. Other commenters also believed that daytime interference should be considered. The Association for Broadcast Engineering Standards believed that a secondary priority should be awarded to non-commercial applicants.

116. Commenters in opposition voiced a wide variety of concerns and offered suggestions for different migration preference factors. A common argument from many consulting firms, some of which supported their contentions with detailed examples, was that the stations which the FCC would most prefer to migrate, have the least incentive to do so because they are the older, well established fulltime stations, which cause the most

interference, but also have the largest coverage areas.[48] In many cases, the older stations would suffer large losses in service area if they were to migrate. The commenters who advanced this argument believe that preferences should go to stations that receive high levels of nighttime interference and, consequently, have small interference free service areas. Great Empire Broadcasting urged that the FCC switch its emphasis to service provided and suggested some alternative ratios which it believes represent more appropriate improvement factors. Several commenters expressed the belief that daytime-only stations or those causing daytime interference, especially interference involving Class IV stations, should be awarded some preference (E. Harold Munn, NAB, Capital Cities/ABC). Robert A. Jones objected to consideration of existing fulltime stations ahead of daytime-only stations and recommended that any first daytime or nighttime local service be given a preference before others. Cohen, Dippell and Everist oppose our proposal to use the expanded band for interference reduction only. They proposed that Travelers Information Stations (TIS) users be assigned to 1690 and 1700 kHz, an additional two full channels be set aside for educational broadcasters, and, for the remaining channels, existing daytime-only stations should be given priority.

117. **Discussion.** After careful consideration, we believe that revising the priority scheme through an emphasis on stations receiving interference, as opposed to stations causing interference, would be counterproductive because this would stray from our objective in this proceeding - the reduction of congestion and interference in the AM band. Stations that have high nighttime interference-free contours, in most cases, cause the least amount of interference to other existing stations. Shifting priority to daytime-only stations will not reduce the interference situation at night at all. Further, we note that the capacity of the expanded band would only accommodate less than 10% of existing daytime-only stations if it were used solely for that purpose. The intermodulation problem raised by NAB is a receiver deficiency and should be corrected as such. This problem occurs only on certain types of newer digital receivers. No older receivers are affected. Therefore, this problem is entirely one involving receiver design and can be cured by receiver manufacturers.

118. We believe that granting a preference to a station migrating to the expanded band if the station currently provides a community its only local service is not warranted. A first local service preference is, in some contexts, a sensible corollary of our obligations under Section 307(b) of the Communications Act to provide a fair, equitable, and efficient distribution of radio services. For example, where we are faced with a choice between two entirely new stations, such a preference is quite sensible. In the present situation, however, we are not faced with a similar choice, because the local station is already in operation. Therefore, our refusal to grant such a preference does not foreclose the availability of local service in the affected community, nor would grant of the preference in any way improve the distribution of stations.

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[48]See, for examples, comments of Great Empire Broadcasting, Inc. at 19 to 20; Lahm Suffa & Cavell, Inc. at 7; and duTreil, Lundin & Rackley, Inc. at 14.

119. In regard to making a specific allocation to TIS on 1690 and 1700 khz, this step would impair the expanded band's ability to accommodate preferred migrators. Minimizing interference to primary stations and providing maximum site selection flexibility for TIS are best achieved by opening the entire AM band to TIS. See paragraphs 191 to 200.

120. We continue to believe that fulltime stations, that would reduce interference and congestion by moving to the expanded band, represent the most beneficial migrators and that comparing improvement factors is an appropriate basis for selecting between petitioners that desire to migrate. (See paragraph 125). In this fashion, the petitioner that brings the greatest relief from interference and congestion will be selected. Commenters have suggested that those stations with the greatest interference rights have little incentive to migrate. However, because of the voluntary nature of this process, even if the amount of interference reduced is smaller than we could in theory remedy in this proceeding, the reductions that do occur assure that migration would be nonetheless beneficial.

121. We also find the comments supporting a daytime improvement factor sufficiently persuasive for us to alter our initial approach to some extent. We are adopting a revised improvement factor scheme which incorporates a preference factor for daytime interference in addition to the proposed factor for nighttime interference. In recognition of the importance of reducing daytime interference, we are adopting the same approach for calculating the daytime improvement factor that we proposed in the Notice for the nighttime, that is, the ratio of the area of daytime interference caused (co-channel and adjacent channel) to the area of daytime service provided. This method is a logical extension of the nighttime interference factor.

122. However, where nighttime interference and service is determined using the Root-Sum-Square (RSS) method, the calculation of daytime groundwave interference and service is based on the amount of contour overlap adjusted for contour protection ratios. That is, if the normally protected contour of one station is overlapped by the interfering signal of another station on the same or first adjacent channel, the amount of interference caused is equal to that portion of the overlapping area in which the ratio of the desired signal to the undesired (interfering) signal is less than the co-channel or first adjacent channel protection ratio, as appropriate. The daytime service area of a station is equal to the area within its normally protected contour less any area lost to interference as determined above. We will not consider the effects of stations operating on second and third adjacent channels both because the rules regulating second and third adjacent channel spacings permit such stations to operate close to each other (well inside the normally protected contours) and because such rules are intended to control receiver cross-modulation and inter-modulation problems and do not lend themselves to determinations of areas of interference.

123. In calculating the daytime contours, theoretical conductivity values will be used for the purpose of determining the daytime improvement factor. Although it would be possible to use measured conductivity data in connection with the contour calculations for the improvement factor, we conclude that the benefits of this approach would be very minimal. In order to use such data fairly, a complete search of all available measurement data for all

stations would be necessary. Even with all measured conductivity values considered, we believe that, with few exceptions, the effect of the measurement data would even out and there would be little overall impact on the ultimate ranking of prospective migrators.

124. The improvement factors for daytime and nighttime are defined as the ratio of daytime and nighttime interference caused to the amount of daytime and nighttime service that the station provides.[49] Each improvement factor will be calculated independently and then, both improvement factors for the daytime and nighttime will be added together, thus giving equal weight to each factor. Given that interference tends to be greater at night and interference-free service areas are greater in the daytime, the improvement factors will still tend to favor reductions in nighttime interference.

125. To summarize, if no fulltime station requests an allotment in a given area, the next priority will go to daytime-only stations. Daytime-only stations located within the 0.5 mV/m-50% skywave contours of Class I stations and which are licensed to serve communities of 100,000 or more that currently lack a local fulltime aural service will be considered first priority among daytime-only facilities. This will give us the opportunity to make a fulltime allotment to several medium size cities in or adjacent to major metropolitan markets that now lack a local fulltime aural station and have no reasonable prospects for obtaining one. See Notice at paragraph 78. The next priority will go to other daytime-only stations, consistent with the improvement factor calculation methodology described above that ranks stations according to which ones cause the most daytime interference in relation to the service provided.[50] As discussed in more detail in the AM Stereo section, stations within each priority group that propose to broadcast in AM stereo will be awarded a preference. See paragraphs 184 to 190.

D. Allotment or Assignment Options.

126. **Background/Proposal.** There are two planning methods under consideration for the development of the expanded band: allotment planning or assignment planning. Assignment planning would enable us to maximize the number of stations on each channel. Such a method would require each applicant to choose a specific site and custom design the station's technical parameters such as frequency, power and antenna systems to protect other

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[49]For the purpose of determining the nighttime interference free contour when calculating the improvement factor, the RSS 0% exclusion method, including first adjacent channel contributions, will be utilized.

[50]Because our goal is a reduction of interference in the existing band, we find no compelling reason to consider daytime-only stations that have improvement factors equal to zero to be eligible to migrate to the expanded band. In addition, no consideration will be given to nighttime interference reduction for Class II-S and Class III-S stations when determining their improvement factors.

assignments. By contrast, allotment planning requires the Commission to perform the initial planning by specifying, for each allotment, an area within which a station on a given channel may be established with generally fixed technical parameters.

127. The Notice proposed to employ the allotment approach for the expanded band. We recognized that this approach should be implemented in a flexible manner, which may require some variability in inter-allotment separations during the development of the allotment plan to ensure that preferred migrators in areas of concentrated demand may be accommodated to the benefit of the AM service as a whole.

128. **Comments.** Except for several concerns more appropriately addressed in connection with the sample allotment plan, commenters did not specifically address the issue of whether allotment or assignment planning should be used.

129. **Discussion.** While it is true that assignment planning employing individualized parameters and advance knowledge of transmitting sites would enable us to maximize the number of migrating stations, we find that an allotment plan will be more likely to produce the high quality service we seek for the expanded band. Furthermore, it is important that the planning method chosen for the expanded band encourages the migration of preferred migrators, in order to realize the maximum degree of AM improvement. Allotment planning will result in simpler broadcast facilities than would be the case with assignment planning, since the use of large and elaborate directional antennas would be minimized. Therefore, we believe that the development of a flexible allotment plan for the expanded band is the best means of initiating service in the new band consistent with our overall AM improvement goals. Such a plan should allow small variations in inter-allotment spacings to permit sufficient flexibility to derive an allotment plan that would satisfy the needs and interests of licensees that desire to migrate and to ensure that the expanded band would be as interference-free as possible. Also, we believe that a site tolerance on the order of 20 km would be desirable to define the allotment area. This approach will enable us to establish Model I service in this new spectrum, while ensuring that the site location requirements of preferred migrators can be accommodated.

E. Sample Allotment Plan.

130. **Background/Proposal.** The Notice envisioned the development of a sample allotment plan based upon letters of intent received from prospective migrators. The purpose of the sample allotment plan was to illustrate the methods that would be used to create the final plan and to receive beneficial comments to guide us in establishing the process for creating the final plan. We proposed to require all allotments in the sample plan to be at least 800 kilometers (497 miles) from the nearest co-channel allotment area, and 200

kilometers (124 miles) from the nearest adjacent channel allotment area, except in Zone 1.[51] In Zone 1, we proposed separations of 400 and 200 kilometers (249 and 124 miles), subject to the provision of adequate protection. Lastly, the Notice described the methodology to be used for development of the allotment plan. The reduced separations for Zone 1 were proposed in anticipation of high demand for channels in this area.

131. **Comments.** Few comments were directed specifically at the proposed sample allotment plan. E. Harold Munn Jr. and Associates expressed concerns that the proposed spacing requirements are unrealistic. Munn also raised practical concerns regarding the FCC's ability to administer an allotment procedure.

132. **Discussion.** The substantial volume of letters of intent received from potential migrators is a clear indication to us that a high level of interest exists in the development of a sample plan for the expanded band. The spacing requirements proposed in the Notice were conceived under the assumption that the demand for expanded band facilities would be substantially greater in Zone 1 than in the rest of the country. Based upon the letters of intent submitted, we find that this is not the case. The distribution of letters of intent from stations located in Zone 1, as compared to stations in other zones, contradicts our previous expectations of disproportionate interest from stations in Zone 1. This level of interest does not appear to warrant the reduced spacing of 400 km proposed in the Notice. Accordingly, we have endeavored to utilize allotment spacing separations appreciably greater than 400 km in Zone 1, and between allotments in Zone 1 and those located elsewhere in the country. Outside Zone 1 we have attempted to achieve spacing separations as close to 800 km as possible, consistent with the station locations requested in the letters of intent and the development of a sensible plan. Regarding commenters' concerns about the impact of allotment plan development on Commission resources, we believe that in the long term, an allotment plan will be simpler to administer than the assignment method and accordingly will be less demanding on resources. While we recognize that allotment planning involves some compromises in spectrum efficiency and channel loading, the benefits gained in interference control and administrative ease outweigh the drawbacks. Finally, it should be noted that there are still some uncertainties to be resolved regarding use of the expanded band in international border areas. Work continues on bilateral negotiations to finalize agreements on this matter. However, parties are advised that the sample allotment plan being presented is subject to possible revisions, particularly in border areas. Since the sample allotment plan is primarily for illustrative purposes, these potential discrepancies are of little consequence.

133. The sample allotment plan we have developed is based upon the voluntary letters of intent filed in response to the Notice. Ranking of all the candidates for the sample allotment plan was performed after identifying the priority group within which the station filing the letter of intent belongs. These groups are: (a) fulltime stations ranked using the

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[51]Zone I is geographically delineated in Figure 1 of Section 73.699 of the Commission's Rules. It is generally east of the Mississippi River and North of Kentucky and North Carolina.

sum of daytime and nighttime ratios of the areas of interference caused to the areas of service provided; (b) daytime stations located within the 0.5 mV/m-50% skywave contours of Class I stations and which are licensed to serve communities of 100,000 or more that currently lack a fulltime aural service; and (c) daytime-only stations ranked according to the ratio of the area of daytime interference caused to the area of daytime service provided. It should be noted that within each group, the stations were ranked using the AM improvement factor i.e. the ratio of the areas of interference caused to the area of service provided as described in paragraph 124.[52] For all improvement factor calculations, both for interference and coverage, 0% exclusion was used for nighttime calculations in order to give the truest measure of improvement. The groups were then merged, creating a single ranked list.

134. After creating the ranked list of letters of intent, the candidates were examined in sequential order, starting with the highest ranked letter of intent and continuing down the list. An attempt was made to allot as many high ranked letters of intent as possible consistent with applicable adjacent channel considerations in the existing band, and expanded band co- and adjacent channel spacing requirements of 800 km and 200 km, respectively. If no allotment could be made due to conflicts that occurred with previously allotted, higher ranked letters of intent, we attempted to reallot the higher ranked candidates to different expanded band frequencies in order to create an available allotment opportunity for the lower ranked station. If this attempt was successful, the developing allotment plan was revised accordingly and the procedure advanced sequentially to the next lower candidate. When a letter of intent could not be given an allotment due to conflicts on all expanded band channels with higher ranked letters of intent that had been previously awarded allotments, and the computer algorithm was unable to produce an alternative scenario satisfying all applicable constraints, the subject letter of intent was not given an allotment. Under these circumstances, the procedure advanced to the next highest ranked letter of intent until all letters of intent had been considered. In no case was a lower ranked letter of intent allowed to eliminate a previously allotted, higher ranked letter of intent from the sample allotment plan. This ensured that the maximum number of high ranking candidates received allotments. The resultant sample allotment plan is attached as Appendix D.

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[52]Because we did not anticipate a preference for AM stereo operation at the time of the Notice, the letters of intent used to develop the sample allotment plan were not required to include information on the candidate's intent to use AM stereo. Accordingly, an AM stereo preference was not incorporated into the sample allotment plan. Additionally, because the Notice did not anticipate the incorporation of a daytime interference component in the ranking of unlimited time stations, time constraints precluded the development of software which would accomplish this task. For this reason, unlimited time stations in the sample plan were ranked only upon the basis of their nighttime interference components as proposed in the Notice. Both the AM stereo preference and the daytime interference component will be utilized in the development of the actual allotment plan.

F. The Selection Process for Migrating Stations.

135. **Background/Proposal.** The Notice proposed to announce a filing window, within which petitions for authority to move to the expanded band could be filed. Unlike our present application process, no showing would be required for the proposed new operation; technical information would address only the petitioner's currently licensed station. All candidates would be required to operate Model I facilities unless restricted by international agreements or special circumstances that warrant variations. Should the Commission rule favorably on the petition, we would specify the frequency to be used and any additional pertinent technical details. To receive an assignment, successful petitioners would then be required to file a complete application on FCC Form 301.

136. **Comments.** The administrative aspects (opening a filing window, petitions, etc.) drew little comment. A few commenters expressed the view that interference gains and losses, for purposes of calculations used in improvement factors, would be better represented by population counts rather than by area comparisons.

137. **Discussion.** We remain convinced that the general approach outlined in the Notice is both a viable and an efficient approach to administering the selection process. Accordingly, we will announce a filing window during which licensees of stations in the existing band may file petitions for exclusive allotments in the expanded band. The allotment is exclusive in the sense that if a petitioner is selected for migration, an allotment will be made to the petitioner's community of license and only that petitioner will be eligible to apply for the corresponding assignment.[53] The petition must include an accurate description of the existing band station (call sign, community of license and operating frequency) seeking to migrate and any additional information necessary to rank the station, such as an intention to use AM stereo.[54] We will develop an official allotment plan using the same method employed to develop the sample allotment plan.

138. We will then publish the official allotment plan after which all petitioners will have thirty (30) days to comment with respect to questions of fact. After the plan becomes final the petitioners selected for migration will be given 60 days in which to file an application for a construction permit. This will be a standard application subject to the usual statutory and regulatory requirements and will be processed accordingly, except that it will

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[53]An allotment is the association of a particular frequency or channel with a specific community. An assignment is an authorization (license) given by the Commission for a party (licensee) to use that frequency or channel under specified conditions. In normal practice allotments and assignments are made at the same time in the AM and non-commercial FM services; in the commercial FM and television services allotments and assignments are made separately and independently.

[54]Paragraphs 184 to 190 describe how AM stereo preferences will be applied.

not be put on an "A" cut-off list for competing applications.

139. As noted above, the amount of interference used in calculating an improvement factor is obtained from the size of the area experiencing the interference and does not take direct account of the population within the area affected. This is consistent with the central theme of this proceeding which seeks to restore the overall integrity of the AM service by bringing stations more into conformity with our basic standards and obtaining a proper balance between daytime and nighttime service areas. We have deliberately refrained from engaging in individualized ad hoc problem solving. We believe this to be the proper approach because it is the AM service as a whole that is foundering and not merely a select group of specific stations.

140. To properly consider population we would also have to take account of alternative services such that interference to a given population with, for instance, 15 other aural services would be weighted differently than a similar sized population having 5 alternative aural services. Assuming this could be done accurately and promptly for hundreds, possibly thousands, of cases, the resulting numbers would leave an impression of significance and importance that obscures the fact that a major portion of any audience is mobile and that the correlation between listeners and census measurements is at best approximate. This issue was addressed by the Commission in 1964 in a proceeding[55] establishing basic principles that have governed the AM service since then.

> "Insofar as concentration on the facts of each individual case must inevitably distort our sense of perspective in viewing the AM allocation picture as a whole, the ad hoc process may, (except in very extraordinary cases), work at cross-purposes to our basic station assignment goals."

141. The commenters have not persuaded us that population should be used instead as a criterion in deciding which actions will best reduce overall congestion and interference. For these reasons we have decided that interference rankings will be based on the size of the area receiving interference.

142. The following summarizes the steps involved in developing the allotment plan:

(a) The Commission will issue a Public Notice announcing a filing window during which AM stations may file a petition for establishment of an allotment in the expanded band. No filing fee will be required for such petitions. After the filing window closes, the Commission will issue a Public Notice (for information purposes) that lists all stations that filed petitions.

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[55]See 45 FCC 1515, paragraph 14.

(b) The Commission will extract relevant data from the petitions and enter the information into the database.

(c) The Commission will rank all petitions in accordance with the priority groups and improvement factors described in the Report and Order.[56] The priority groups are: (1) fulltime stations ranked according to sum of daytime and nighttime improvement ratios of the areas of interference caused to the areas of service provided; (2) daytime stations located within the 0.5mV/m-50% skywave contours of Class I stations and which are licensed to serve communities of 100,000 or more that currently lack a fulltime aural service; (3) daytime-only stations ranked according to the ratio of the area of daytime interference caused to the area of daytime service provided.

(d) Based upon the overall ranking of the petitions performed in step (c), the Commission will produce the Allotment Plan.[57]

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[56]To calculate improvement factors for petitions to migrate to the expanded band, the AM engineering database will be used. Each U.S. station record in the database includes an entry that identifies the station's domestic status on the basis of three possible operational categories - license, construction permit, or application. License records will be used except that the construction permit record will be used in either of the following two cases: (1) when a licensed station also has a construction permit; or (2) when a station is not licensed but has a construction permit. If an existing band station ultimately is allotted an expanded band channel on the basis of an existing band construction permit for which a license application has not been filed with the Commission by the close of the window, the five-year period for simultaneous operation of existing and expanded band stations will not apply and the existing band construction permit will expire at the end of the normal 18 month construction period, with no provision for extension. Pending applications will be excluded from improvement factor calculations.

With respect to the use of foreign records in the AM engineering data base, the following procedures will apply: (1) interference to foreign stations will not be considered; (2) interference to or from stations in Cuba or the Dominican Republic will not be considered; (3) interference from a station in Canada or Mexico that has been notified and accepted under the terms of the applicable bilateral agreement will be considered; and (4) interference from foreign stations not included in (2) and (3) above which the U.S. has accepted under the terms of multilateral agreements will be considered.

[57]Licensed stations and outstanding construction permits on 1580, 1590, and 1600 kHz will be accorded due protection during the development of the 1610-1700 kHz allotment plan. Petitions filed for expanded band allotments may be precluded because of applications on file for facilities on the frequencies 1580, 1590 and 1600 kHz. Each petition will be checked for possible conflict with applications on these frequencies. Applications that have been accepted

(e) The Commission will then issue a Public Notice identifying the stations that are eligible to apply for authorizations associated with specific allotments. Stations not selected for migration will be given thirty (30) days to file for reconsideration of the Commission's action with arguments limited to addressing errors in the selection process.

(f) After the allotment plan has become final and no longer subject to Commission reconsideration, the Commission will enter the allotment into the Commission's AM Engineering Data Base. This entry will include location, frequency, whether or not AM stereo is to be used and other generic technical information with regard to the particular allotment.

(g) Stations selected for migration will be afforded sixty (60) days from the date the allotment notice becomes final in which to file an application for a CP on the allotted channel. The application should be filed on Form 301 and must be accompanied by the normal filing fee for such application.

(h) After acceptance of the application for filing, the Commission will then put the application on a cut-off list. The application will then be subject to petitions to deny but not to competing applications.

(i) After grant of the CP application and construction of the authorized facilities, the permittee will then file a covering license application on FCC Form 302. Licenses for stations in the 1605-1705 kHz band will be issued for a term that is concurrent with the existing license for the operation in the 535-1605 kHz band.

(j) One year after the initial allotment plan has become final (see (f) above), those allotments provided for in the initial allotment plan that have not been authorized (or for which timely applications are not pending) will be deleted from the Commission's data base and the Commission will open a second filing window to allow for petitions by existing stations to migrate to the expanded band.

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and cut-off will also be afforded complete protection rights from any subsequent 1610-1700 kHz allotment. A conflict that occurs between an application on 1580-1600 kHz that has not been formally accepted for filing and a petition for allotment on 1610-1700 kHz that has been selected for an allotment will be considered as a mutually exclusive situation and, upon timely receipt of the application for allotment, will be subject to the hearing process. While we will not restrict the filing of applications for the frequencies 1580, 1590 and 1600 kHz, action on such applications will be deferred until the allotment plan is developed.

(k) Upon completion of the second filing window for petitions to migrate and the subsequent authorization procedures, the Commission will continue to monitor the migration process to assess the potential for adding additional stations to the band. As part of that assessment, the Commission will determine whether additional allotment windows will utilized or whether to implement a traditional assignment scheme to best maximize the remaining available spectrum.

G. Ownership Limitations and Transition Period.

143. **Background/Proposal.** Recognizing the financial uncertainties of operating a new AM station in the expanded band because of an inability to accurately forecast listening patterns, advertising revenues, as well as the future availability and market penetration of wideband receivers, the Notice proposed that some changes be made to our multiple ownership rules in order to facilitate migration to the expanded band. Specifically, the Notice proposed that a note should be added to the multiple ownership rules creating an exception to the duopoly rule that would permit the simultaneous ownership and operation of an expanded band and an existing band station with overlapping 5 mV/m contours for a fixed transition period. After the expiration of the transition period, the license for the existing band station would be surrendered. The Notice also proposed that a licensee would be permitted, without limit, to duplicate on the expanded band channel the programming carried over its existing AM band channel. Also, the Notice proposed to modify the national ownership rule to permit an existing AM licensee to own and operate an expanded band station during the transition period even if this gave the licensee a cognizable ownership interest in excess of the national limits.

144. **Comments.** There was wide support for dual ownership of existing band/expanded band stations during a transition period, after which the existing band license would be surrendered. Those few commenters who specifically addressed the proposal regarding national ownership limitations supported it. Most commenters suggested that the transition period for dual ownership should range anywhere from five to ten years. The NAB supported a five year transition period, after which time the Commission could evaluate the penetration of the full-band receiver market and the status of the popularity and development of the new band. Many other commenters were adamant that flexibility should be the cornerstone of any transition period that may be selected. Some commenters suggested that intervening factors, including the economic viability of stand-alone expanded band facilities and the amount of expanded band receivers available in the marketplace, should be considered in determining whether an extension of the transition period would be warranted. Other commenters felt that no specific time period should be set forth, but rather the transition period should be linked exclusively to a single criterion such as the substantial presence in the marketplace of full-band receivers. For instance, CBS, Inc. suggested linking the transition period to the presence of full-band receivers in at least seventy-five percent of the households and automobiles in the local marketplace. The proposal to allow simulcasting on both bands also received wide support from commenters. Licensees reasoned that by allowing

simulcasting on both bands, they can avoid additional programming costs and take advantage of economies of scale. Commenters were also of the opinion that permitting simulcasting would provide an incentive for broadcasters to migrate to the expanded band.

145. **Discussion.** The favorable comment received on these proposals reinforces our initial conclusion that temporary dual ownership and operational flexibility are essential to a successful transition to the expanded band. We are therefore persuaded that it is appropriate to adopt new ownership rules for the expanded band.

146. Regarding dual ownership and operation, we believe that the initial time frame set for this transition period should be five years. Considering the emphasis placed by commenters on flexibility regarding this issue, we will monitor progress in the use of the expanded band during this period and grant an appropriate extension if factors affecting the overall development of the band warrant such action. These factors would include, among others, the economic viability of stand-alone expanded band stations and the penetration of full-band receivers in the marketplace. An exception will also be made to our national ownership rules allowing our numerical limit to be exceeded during this transitional phase. We emphasize, however, that following construction of the expanded band station, the license that would be issued if all terms of construction were met would be conditioned on the eventual surrender of the existing band license. As outlined in our Notice, during the interim we would prohibit the licensee from operating on one of its authorized frequencies and selling its operation on the other frequency. If a station is authorized to move to the expanded band, and the licensee later decides to operate on only its former frequency, we will require it to surrender its expanded band authorization and its allotment would be deleted. After an expanded band station is licensed to operate and the transition period has expired, the existing band station will go silent. Any applicant seeking the former existing band frequency will not "inherit" the previous station's radiation rights, but will instead have to meet the standards in effect at the time of the filing.

147. We will also permit simulcasting on both bands during the transition period. Not allowing for such duplication privileges would only act as a disincentive to broadcasters considering moving to the new band. It is vital to employ all means available to encourage broadcasters and listeners to utilize the new band. Considering the economic ramifications of such a move, we believe that same-service simulcasting for a transition period will only help in our efforts to encourage development of the new service. Finally, we acknowledge the separately pending Notice of Proposed Rule Making in MM Docket No. 91-140 regarding the possible revision of the radio multiple ownership rules. The notes that will be added to our current multiple ownership rules in order to accommodate the new AM expanded band will be adjusted, if necessary, to reflect any comprehensive changes that may be made to the rules in that proceeding.

148. In this section, we have adopted an appropriate set of rules for the expanded band which are intended to reduce interference in the existing band, while facilitating the prompt initiation of service in the new broadcasting spectrum. In this way we intend to

maximize the benefits to the AM service as a whole due to the migration process. Of course, no improvement can be realized through these actions alone without the recognition by preferred migrators that such a move would be in their own best interests. We have adopted regulations today that will achieve that effect. We stand committed to our objective of creating a model AM service in the expanded band that will ensure that the full potential of AM broadcasting can be realized.

H. Expanded Band Technical Standards.

149. **Background/Proposal.** The technical standards for the expanded band define how the Commission authorizes, and licensees construct, stations in the band. Currently, there are no rules governing AM broadcast use of the 1605-1705 kHz band. Because these frequencies are adjacent to the existing AM band (535-1605 kHz), a vast body of relevant information concerning technical operation on adjacent spectrum is available.

150. The Notice proposed that the technical standards applying to the existing AM band apply generally to operations in the expanded band. These standards include minimum antenna efficiency and ground system requirements, antenna radiation characteristics, and blanketing restrictions.

151. **Comments.** The commenters generally do not disagree with our proposals. In one of the few comments that specifically addressed this issue, du Treil, Lundin and Rackley proposed to eliminate the requirement for minimum antenna efficiency, as long as the radiation characteristics can reasonably be established.

152. **Discussion.** We remain convinced that our initial proposals will best serve our defined goals and we will therefore adopt them in toto. By this action, we establish for use in the new spectrum, fundamental technical operating criteria that have been applied to AM broadcasting for many years. Use of such criteria links the existing and expanded bands by applying uniform and basic station operational characteristics and provides a known basis for developing the expanded band so as to achieve a significant degree of improvement of the AM service. With respect to antenna efficiency, our view is that unless minimum efficiency standards are set for the expanded band, the frequency resource will be inefficiently used. Moreover, we are of the view that minimum antenna efficiency requirements, including use of at least a quarter wave ground system, ensures that relatively large service areas will be established, and that Model I service objectives may be achieved.[58] Similarly, reasonable assumptions must be made regarding antenna losses, in order to accurately calculate directional antenna patterns.

[58]For a more complete description of the technical characteristics of a Model I station, see paragraphs 101 to 107.

I. City Coverage for Expanded Band Stations.

153. **Background/Proposal.** City coverage requirements define the minimum coverage a proposed facility must provide, day and night. In the existing band, during the day a 5 mV/m signal is required at all locations within the station's community of license; at night, a station's interference-free contour using the current RSS method must encompass the community of license. We routinely consider nighttime coverage of at least 80% as substantial compliance with the community of license coverage requirement.

154. The Notice proposed that stations in the expanded band be required to provide nighttime coverage of 50% of the principal community by the 5 mV/m or the interference-free contour, whichever is greater. Nighttime coverage would be calculated using the RSS method without exclusion. Comment was also sought on the option of allowing 50% coverage on a temporary basis and ultimately returning to the 100/80% coverage standard.

155. **Comments.** While few commenters addressed this issue, most doing so opposed the proposal to reduce city coverage requirements. Cap Cities proposed that 100% of a station's community of license should be served within the station's 5 mV/m contour and suburbs should be served within the station's 2 mV/m contour. Sellmeyer Engineering and CDE opposed a 50% coverage standard, the former saying it would create another group of substandard stations.

156. In support of the Notice proposal, E. Harold Munn stated that the proposal to permit 50% city coverage is consistent with recent Commission decisions regarding coverage. He considers it essential to establish a different level of coverage now that we have proposed a different way to calculate coverage using the RSS without exclusion, and would support the 50% level. He further considers it to be inappropriate to return to the existing 100/80% standard at a later date, an option on which we requested comment.

157. **Discussion.** Since we believe that AM improvement will be accomplished only if facility changes which move the AM service in the direction of the adopted models are granted, resolution of this issue essentially requires the Commission, when determining whether to grant an application for migration to the expanded band, to balance the qualitative improvement of the AM service against the current minimum extent of service. Since signals propagate somewhat less efficiently at expanded band frequencies than in the existing band and close-in sites suitable for AM antennas are increasingly difficult (and expensive) to find, we have raised the possibility of relaxing coverage requirements to facilitate the relocation of preferred migrators.

158. Regarding those commenters urging that more than 50% coverage of the city be required, we note that this position does not address the desirability of facilitating preferred migrators, which was the basis for the coverage relaxation proposed. Furthermore, the limitations imposed on expanded band facilities (power limits, poorer propagation at higher frequencies) may make it difficult for migrating stations to serve their communities from

existing sites. We do not believe a 50% coverage requirement results in substandard stations. While less rigorous than our present standard, the 50% requirement nonetheless insures a signal of significant quality to the community of license and the added flexibility of a 50% coverage rule allows the maximum latitude consistent with the goals of community service, for stations to locate expanded band facilities at cost effective locations.

V. Consolidation

159. In order to achieve our goal of interference reduction in the existing AM band, the Notice sought comment on proposed changes to our non-technical policies and rules intended to motivate broadcasters to reduce interference in the band. Specifically, the proposed changes included: (1) granting tax certificates to AM licensees who receive monetary compensation from another licensee to surrender a broadcast license or to modify an existing facility if those acts resulted in interference reduction; (2) relaxing our multiple ownership rules to permit a licensee significantly reducing interference to co-channel or adjacent channel stations to own AM stations whose 5 mV/m contours overlap; and (3) possibly reimposing an AM-FM program nonduplication rule.

A. Voluntary Agreements.

160. **Background/Proposal.** Section 1071 of the Internal Revenue Code, 26 U.S.C. §1071, permits the Commission to issue a tax certificate to the seller of a regulated property when the sale will give effect to a new or changed Commission policy regarding the ownership or control of broadcast stations. Section 1071 reads, in pertinent part, as follows:

> If the sale or exchange of property (including stock in a corporation) is certified by the Federal Communications Commission to be necessary or appropriate to effectuate a change in a policy of, or the adoption of a new policy by, the Commission with respect to the ownership or control of radio broadcasting stations, such sale or exchange shall, if the taxpayer so elects, be treated as an involuntary conversion of such property within the meaning of Section 1033.

161. A tax certificate enables the seller of the broadcast property to defer any capital gain it realizes by acquiring qualified replacement property within two years of the sale or by reducing the basis of other depreciable property. See 26 U.S.C. §1033. We have used tax certificates to encourage voluntary divestitures of grandfathered ownership interests inconsistent with changes in our multiple ownership rules and broadcast sales to minorities. In the Notice, we stated that voluntary agreements among AM licensees under which one licensee financially compensates another AM licensee to either surrender its license or modify its facilities could significantly improve the overall quality of AM reception by reducing interference and congestion in the AM band. It is now our policy to encourage such agreements. In furtherance of this policy, we have revised our Rules with respect to

contingent applications and competing applications. See Policies to Encourage Interference Reduction Between AM Broadcast Stations, 5 FCC Rcd 4492 (1990). In the Notice, we proposed issuing tax certificates as an additional means of encouraging such agreements. The Notice specifically requested comment on whether an agreement to surrender a license for cancellation is a sale or exchange under Section 1071 of the Internal Revenue Code. We specifically sought comments on several related matters concerning the issuance of tax certificates. These matters included:

(a) whether the use of tax certificates in this case would be consistent with our past use of this tool;

(b) what are the tax implications of voluntary license surrender agreements, i.e. how could they be structured to constitute a sale of property under 26 U.S.C. §1071;

(c) whether we should require a showing that interference will be reduced by some prescribed amount as a prerequisite to our issuing the certificate; and,

(d) when that certificate should be issued.

162. **Comments.** The comments supported the proposal of issuing tax certificates to AM licensees taking steps to reduce AM interference.[59] However, several parties, including the NAB, stated that these tax certificates may have little utility due to the declining value of many AM stations. As such, there may be no gain to defer. Nevertheless, there are circumstances where a gain may be realized either from surrendering an AM license for cancellation or modifying an existing AM facility to reduce interference.[60] The NAB expressed concern that the IRS may take the position that a surrender of an AM license to the Commission is not a "sale or exchange" because the surrendering AM licensee does not transfer anything to the other AM licensee.

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[59]The engineering consulting firm of duTreil, Lundin & Rackley, Inc. ("duTreil) expresses its belief that existing AM and FM stations will eventually be given a preference in the assignment of new digital audio broadcasting (DAB) channels. According to duTreil, this possibility may make AM licensees reluctant to enter into interference reduction agreements looking toward the surrender of their licenses. Therefore, duTreil urges that we consider giving every AM licensee that surrenders its license the same DAB preference that it would have received had it remained on the air. Whether or not existing broadcast stations will receive a preference with respect to DAB channels is outside the scope of this proceeding.

[60]These situations may involve long-held AM stations originally purchased at substantially lower market prices or AM stations with a significant amount of appreciated real estate.

163. **Discussion.** At the outset, we again emphasize that tax certificates are issued pursuant to Section 1071 of the Internal Revenue Code. These tax certificates involve both the Commission and the Internal Revenue Service ("IRS"). Our responsibility in this regard is to determine whether the "sale or exchange of property" effectuates a new Commission policy. As a result of this proceeding, we adopt a new policy to discourage ownership interests in AM stations causing interference and to encourage existing licensees to enter into voluntary agreements to reduce such interference. It is our view that improvement in the technical quality of the AM service will promote the public interest objective of an overall competitive radio broadcasting service. Cf. Telecator Network of America, 58 RR 2d 1443 (1985). To that end, we will issue tax certificates to AM licensees receiving financial compensation for surrendering their licenses for cancellation.[61] In this proceeding, it is also our policy to encourage parties to enter promptly into such interference reduction agreements. For this reason, we will only issue these tax certificates in response to agreements filed within three (3) years of the effective date of this Report and Order. We consider such transactions "necessary and appropriate to effectuate" our new policy of encouraging the reduction of interference in the AM band. We note, however, that the IRS makes the ultimate determination whether the statutory requirement of a "sale or exchange of property" has been met.[62] We will grant tax certificates in the circumstances described above, subject to IRS approval regarding the "sale or exchange of property" determination.[63]

164. The Notice also proposed issuing tax certificates to those licensees that modify their facilities to reduce interference. While we continue to encourage such voluntary agreements, we believe the issuance of tax certificates in such situations to be legally problematic as regards the statutory requirement of a "sale or exchange". We will, therefore, limit the issuance of tax certificates to situations involving a surrender of a license.

B. Common Ownership.

165. **Background/Proposal.** Reduction of interference to stations in the existing AM

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[61]We would issue the tax certificate upon the surrendering of the AM license for cancellation.

[62]We note that a transaction involving the sale of a station and surrender of its license has traditionally been construed to involve a "sale or exchange of property" within the meaning of Section 1071. See Policy Statement on Issuance of Tax Certificates, 92 FCC 2d 170 (1982). We also think a reasonable argument can be made that an agreement to surrender a license in exchange for payment can be viewed as a sale or exchange within the meaning of 1071.

[63]The NAB also addresses the issue of the reinvestment of the financial compensation into technical equipment to be used at a broadcast station and whether such an expenditure would qualify for nonrecognition as qualifying replacement property. Whether or not this expenditure meets the "property similar or related in service or use" requirement set forth in Section 1033 of the Internal Revenue Code is within the purview of the IRS and outside the scope of this proceeding.

band is an important goal in this proceeding. One approach to achieving this goal involves the relaxation of some Commission non-technical policies and rules which would ideally have the effect of motivating broadcasters to reduce interference in the band. One non-technical method proposed in the Notice to accomplish this goal was to waive Section 73.3555(a)(1) of our rules -- the AM duopoly or contour overlap rule -- on a case-by-case basis, to permit common ownership of two commercial AM stations with overlapping 5 mV/m contours if an applicant showed that a significant reduction in interference to adjacent or co-channel stations would accompany that common ownership. Simultaneous broadcasting of the same program on both stations would be permitted if the stations served substantially different markets or communities. In order to ensure that the promised interference reduction would result from the joint ownership, we proposed to require applicants to submit, along with their waiver requests, contingent applications for the major or minor facilities change needed to achieve the necessary interference reduction.

166. **Comments.** The common ownership proposal for the existing band generally found wide support among the commenters. Commenters generally agreed that changes in the economy, in technology, and in the number of media outlets have considerably lessened the ability of AM stations to dominate the marketplace, and that, therefore, concerns about undue media concentration resulting from common AM ownership have considerably diminished. Similarly, most commenters argued that significant gains could be made if licensees were permitted, in some instances, to operate co-located AM facilities. Comments submitted by the NAB are representative of the majority of positive comments received regarding this proposal. The NAB argued that the result of common AM ownership and operation is that broadcast operations will become more economically efficient through economies of scale as well as salary and capital expenditures savings. According to the NAB, the public would also benefit by common ownership and operation because licensees could devote more resources to areas such as news and public affairs programming. Those commenters opposing grant of the interference reduction waivers argued that such common AM ownership would result in lack of viewpoint diversity and encourage marketplace concentration.

167. Generally, most commenters, including the NAB and CBS, Inc., agreed that a "significant" amount of interference reduction be required in order to get a waiver grant. Most also stated that no prescribed amount should be imposed because that prescribed amount would be an arbitrary figure. On the other hand, Greater Media, Inc. did suggest that a reduction of at least 20% in interference, based on the number of square kilometers of contour overlap, should be the threshold for consideration for such a waiver. Greater Media also argued for excluding from consideration factors that might affect diversity or market concentration when determining the merits of a waiver request. Other commenters made the suggestion that in addition to interference reduction waivers, the Commission should also consider waivers of the duopoly rule if that would result in economic benefits to financially struggling stations, even if interference reduction is not achieved.

168. Most commenters did not specifically address the simulcasting issue raised in the context of the common ownership proposal. It would appear from the lack of response

received that there was no disagreement with our proposal to allow simultaneous broadcasting of the same program on commonly owned AM stations if the stations served substantially different markets or communities.

169. **Discussion.** After careful review of the comments, we continue to believe that a balanced case-by-case waiver approach to allowing common ownership in exchange for interference reduction in the existing band is best suited for our purposes. We therefore adopt the proposal made in the Notice limiting grant of waiver requests to those situations that result in interference reduction to co-channel or adjacent channel stations. In making our waiver decisions, however, we will remain mindful of viewpoint diversity and market concentration and will consider these factors in conjunction with what will be accomplished by an interference reduction proposal. We will require to be filed, along with waiver requests, contingent applications for major or minor facilities changes demonstrating the nature of the interference reduction to be accomplished. In view of the potentially wide range of factual circumstances in which beneficial interference reduction may occur, we decline to adopt a benchmark which a proposal must meet to be considered as one resulting in "significant" interference reduction. However, we will be guided by factors such as those enunciated in our migration selection processes in determining whether a reduction is "significant". Simulcasting on these commonly owned stations will be permitted if the stations serve substantially different markets or communities.

170. Since the radio multiple ownership rules may be modified pursuant to the separately pending Notice of Proposed Rule Making in MM Docket No. 91-140, we acknowledge that a future rule revision may allow for commonly owned AM stations without any demonstration of interference reduction. At this juncture, however, our goal is to improve the overall state of the AM service and to offer incentives to aid in attaining this goal within the parameters of this rule making. Any adjustment or expansion to our limited multiple ownership rule changes in this proceeding will be coordinated with any overall future changes that may be implemented with regard to these rules.

C. AM-FM Programming Nonduplication Rule.

171. **Background/Proposal.** AM-FM program duplication, or simulcasting, refers to the simultaneous broadcasting of a particular program over co-owned AM and FM stations serving the same market, or the broadcasting of a particular program by one station within 24 hours before or after the identical program is broadcast over the other station. Before 1964, there were no program duplication limits on co-owned AM and FM stations serving the same market. In that year, the Commission adopted program duplication rules limiting FM stations to duplication of no more than 50% of their programming from a co-owned AM station serving the same local area. By this rule, the Commission sought to further two goals. First, the Commission sought to foster the development of the FM service by encouraging the public to purchase and use FM receivers. This, the Commission believed, was best achieved by the development of separate programming on the AM and FM bands. Second, the Commission sought to reduce what it perceived as inefficient use of the spectrum resulting

from duplication of the same programming on two stations serving essentially the same audience.

172. Ten years later, taking note of the tremendous growth of the FM service, the Commission initiated a proceeding to revisit the question of program duplication. In that proceeding, the Commission further limited AM-FM program duplication. The rule adopted therein permitted not more than 25% duplication if either station served a community with a population of more than 25,000.[64]

173. In 1986, the Commission deleted the program duplication rule. The Commission cited three reasons for this action. First, the FM service had developed to the point that FM stations were fully competitive. The Commission therefore did not find it necessary to continue to foster the growth of FM through a separate programming requirement. Second, elimination of the rule was not expected to result in inefficient use of spectrum. Rather, it was expected to result in increased hours of operation for those stations that had shortened their broadcast day as a means to comply with the rule. Third, elimination of the rule was thought to provide licensees of AM-FM combinations maximum flexibility to respond to economic conditions facing the AM service. That is, elimination of the rule would allow licensees to reduce operating costs for marginal AM stations.

174. In the Notice, we sought general comment on three questions regarding whether the Commission should impose limits on AM-FM program duplication. We recognized that duplication may be effective in assisting a fledgling or financially weak AM station stay on the air, but noted that the usefulness of program duplication may be limited. Stating that we are unaware of any instances where use of duplication actually reversed a decline in audience share or served to establish a permanent economic base, we first asked that commenters address themselves to the efficacy of program duplication as one means of helping marginal stations stay on the air. Second, we asked commenters to consider the preclusive effect that the existence of an AM station has on the use of adjacent channels and the limits a station places on the ability of other licensees to modify or improve their facilities and to comment on whether these considerations outweigh the policy articulated in MM Docket No. 85-357. Third, we requested comment on whether program duplication would assist or obstruct attainment of our overall objective to revitalize the AM service by the year 2000.

175. **Comments.** The comments are divided on the question of reimposing some form of AM-FM programming non-duplication. Generally, commenters who would have the Commission prohibit program duplication argue that such a rule would lead to a more efficient use of spectrum and would increase program diversity. Commenters who oppose limiting program duplication also believe that the policy they support increases program diversity. In addition, these commenters feel that programming duplication is the only means by which many marginal AM stations can survive.

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[64] Report and Order in Docket No. 20016, 59 FCC 2d 147 (1976).

176. Several commenters, including Group W, Alabama Native and Great Empire support a rule that would limit program duplication. Group W believes that program duplication is a detriment to the AM service with little offsetting benefit. Group W submits that stations airing duplicated programming generate interference to other AM stations yet provide little service to the public. Group W believes that a rule eliminating simulcasting will encourage the elimination of marginal AM stations and thereby reduce the overall interference in the AM band. Alabama Native is more adamant in its support of a rule eliminating AM-FM program duplication. Alabama Native states unequivocally that any AM station that must simulcast in order to keep from "going under" should go under. Alabama Native submits that it is not in the public interest to permit duplication of FM programming on AM stations, and believes that such duplication is a waste of spectrum. Alabama Native requests that the Commission take a firm stance on the issue and prohibit any duplication. In Alabama Native's view, the result of such a rule would be to revitalize AM broadcasting by reducing interference and allowing expanded local service by those AM broadcasters seeking to serve the public with nonduplicative programming. Also, as indicated in the Notice (at footnote 34), we have included as part of the record in this docket, the petition for rule making filed in 1989 by Earl J. Weinreb. Mr. Weinreb requests that the Commission reimpose an AM-FM nonduplication rule arguing that many marginal AM stations remain on the air only by simulcasting a co-owned FM thereby denying others the opportunity to present original programming.

177. CBS, NAB and several other commenters support allowing program duplication. CBS and NAB argue that licensees should be afforded maximum flexibility to respond to current difficulties created by the economic and technical decline of the AM service. In addition, these parties argue that the Commission properly eliminated program duplication rules in 1986 based on the effectiveness of the market in limiting duplicative programming. According to these parties, the real effect of a rule limiting duplication would be to deprive AM broadcasters of a means to contend with current market problems in the relatively few instances where use of such programming would be of immediate benefit.

178. **Discussion.** The record in this proceeding raises significant questions about the public interest benefits that are said to flow from our current policy of permitting AM-FM combinations to duplicate as much programming as they desire on two stations serving the same community. In this regard, we note that some commenters have argued that program duplication on many AM-FM combinations is a waste of spectrum. As these commenters observe, the service areas of most combinations are largely equivalent because both stations are licensed to the same community and have similar coverage requirements. In these instances, it can be argued that the listening public receives little benefit from program duplication and, in fact, is deprived of the opportunity to hear a different voice in the community.

179. It should also be noted that the cost to the public in terms of diversity may not be limited to the particular station at issue. As we stated in the Notice, when a channel is licensed to a particular community, others are prevented from using that channel and six

adjacent channels at varying distances of up to hundreds of kilometers. Accordingly, where an AM station duplicates the programming of an FM station with a substantially equivalent coverage area, it appears that the limited amount of spectrum available could be used more efficiently by other parties to improve service and diversity.

180. We are sympathetic, of course, to the arguments of some commenters that a rule limiting program duplication by AM-FM combinations could make it more difficult for some AM stations to survive in the current economic climate.[65] In this regard, we recognize that we do not have complete information with respect to the number of AM stations that might be adversely affected by a program duplication restriction. The comments in this proceeding provided examples of how program duplication is helpful in supporting specific AM stations. For instance, one commenter described its success in using duplicative programming to support an expanded schedule of specialized programming on its AM station. In addition, commenters provided several specific examples in which the use of program duplication is said to be the linchpin to the viability of an AM station. The NAB also submitted data regarding the economic efficiencies that generally result from the use of program duplication.

181. We generally believe that encouraging separate programming by AM-FM combinations would effectively serve both our interest in promoting diversity and our objective of reducing interference and congestion in the AM service. In particular, we believe that it may be appropriate to restrict AM-FM combinations serving substantially the same commmunity[66] from duplicating more than a set amount (e.g., 25%) of programming. This approach would give AM-FM combinations the flexibility to simulcast some portion of their programming, while also helping to ensure that the radio spectrum in a given community is used in an efficient manner that promotes an optimum AM service.

182. We recognize, however, that conditions in the AM band may change substantially during the next few years. Indeed, the decisions we implement in this proceeding are intended to precipitate such change. As the AM service responds to our actions and new developments in the industry unfold, many stations may face different economic situations. Under these dynamic conditions -- and in view of the somewhat uncertain information we currently possess concerning the overall impact that new program duplication limits may have on the AM service -- we conclude that adopting such restraints at

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[65]It could also be argued that, in the event some AM stations were forced to go dark in the face of such restrictions, other existing stations might be able to improve their service, since the preclusionary effect of the defunct station would be eliminated. Similarly, a decrease in the number of marginal AM stations could have the beneficial effect of reducing overall interference in the AM band.

[66]Defined as where more than 50% of the nighttime service area of one station is overlapped by the nighttime service area of the other station.

this time would be premature. Accordingly, we will revisit this issue at the end of three years to determine whether, informed by a more certain knowledge of the direction of the AM service, program duplication limitations are advisable.

183. In summary, we believe that the changes to our rules and policies that we have adopted in the non-technical areas will serve to enhance the existing AM service through the achievement of overall interference reduction in the band. Likewise, our decision to revisit the issue of imposing a program nonduplication requirement in three years will enable us to assess the impact of the decisions we make today on the AM service and better evaluate the need for program duplication limits. Moreover, adoption of changes such as the encouragement of voluntary arrangements to reduce interference through the issuance of tax certificates and the relaxation of our multiple ownership rules for those who can demonstrate significant reduction of interference to other AM stations, will help reshape the service and foster long-term benefits so that it can reach its maximum potential.

VI. AM Stereo

184. **Background/Proposal.** For several years, AM stereo has been offered as a partial solution to the problems confronting the AM broadcast service. In the Notice, we proposed that both Model I and Model II stations would utilize stereo modulation and sought comment as to what decisions regarding stereo would be useful in this proceeding.

185. **Comments.** Many commenters opposed a requirement for mandatory provision of AM stereo service, preferring instead the present voluntary system. Most cited economic considerations as their reason for opposing the mandatory requirement.

186. **Discussion.** The reasons advanced by those opposing a mandatory AM stereo requirement have convinced us that the provision of AM stereo in the existing band should remain a voluntary decision. Arguments of economic hardship are very persuasive for stations remaining in the existing band, since many of these stations are already in precarious financial situations and cannot afford the cost of converting their facilities to stereo operation.

187. However, in the case of AM stations that are migrating to the expanded band, we believe that there is a compelling reason to provide an incentive for the use of AM stereo. In our view, AM stereo is a valuable asset. Our objective is to create an environment that is competitive with other sources of audio entertainment. Failure to encourage use of AM stereo would send a signal to receiver manufacturers and the public that we are less than completely committed to the provision of a fully competitive service in the expanded band. Additionally, AM stereo operations in the expanded band would provide receiver manufacturers with an added incentive to produce receivers capable of stereo reception for the entire AM band. Accordingly, while we encourage stereo operation in the existing band, we will provide a specific preference for stereo proponents in the expanded band. The incremental expense associated with the provision of AM stereo in a new facility is typically

less than the cost of converting an old facility and represents only a small percentage of the total cost of building a new AM station.

188. The use of AM stereo will enhance the competitiveness of stations in the expanded band by providing the highest audio fidelity available through use of state-of-the-art AM equipment. To encourage migrating stations to acquire this technology at the start, we will provide migration preferences for those existing band stations which, when filing petitions for expanded band allotments, express their commitment to use of AM stereo for their proposed expanded band operation. Under this approach we will favor a migrator who proposes stereo over one who does not where the difference in their improvement factors is not sufficient to outweigh the benefits of stereo operation.

189. We will apply the stereo preference in this manner. As explained in paragraphs 135 to 142, petitions for allotments of expanded band channels submitted by existing stations will be arranged in each priority group in order of the improvement factor calculated for each petitioner. Allotments will be made one-by-one beginning with the highest improvement factor. During this process, we may find that an allotment under consideration (candidate allotment) is mutually exclusive with one or more previously selected allotments (established allotments) and cannot be accommodated in the expanded band. We will substitute the candidate allotment for a previously established allotment provided all of the following conditions are met:

(1) The petitioner for the candidate allotment has made a written commitment to the use of AM stereo and the petitioner for the established allotment has not;

(2) The difference between the improvement factors associated with the candidate and established allotments does not exceed 10% of the improvement factor of the candidate allotment;

(3) The substitution will not require the displacement of more than one established allotment; and

(4) Both the candidate allotment and the established allotment are within the same priority group (e.g., fulltime stations).

190. The 10% differential was chosen to avoid the possibility of an egregious outcome. That is, we would not want a low ranking candidate allotment to replace a much higher ranking established allotment that offered the prospect of a significant reduction in interference and congestion. Such a result would run contrary to the priorities we have articulated in this Report and Order by assigning more weight to stereo than to improvements in interference and congestion. At the same time we anticipate that at the middle and lower levels in each priority group the improvement factors of adjacent and nearby candidate allotments will be fairly close in value. The 10% differential will be sufficient to give a

meaningful preference for stereo.

VII. Travelers Information Stations

191. **Background/Proposal.** Travelers Information Stations (TIS) are low power[67] AM stations authorized in the Local Government Radio Service[68]. Currently they are authorized to operate on either 530 kHz or 1610 kHz on a secondary, non-interference basis to regular AM broadcast stations. Programming may consist only of noncommercial voice information pertaining to traffic and road conditions, traffic hazard and travel advisories, directions, availability of lodging, rest stops and service stations, and descriptions of local points of interest. Several states rely heavily on TIS to advise the motoring public about traffic conditions. Thus, they clearly serve the public interest. They may even have some value to AM broadcasters in that they may attract motorists to the AM band. Nevertheless, because the current TIS frequency of 1610 kHz comprises 10% of the expanded AM band, a decision is necessary on whether TIS should continue to be authorized on 1610 kHz (or some other expanded band frequency) or whether some alternative course of action would be more appropriate.

192. The Notice argued that allocating any expanded band frequency to TIS on a primary basis appeared unjustified in view of the consequent 10% reduction in spectrum available for alleviating congestion in the lower AM band. However, it proposed to permit TIS operation on any of the ten expanded band channels from 1610 kHz through 1700 kHz on a secondary, non-interference basis. Thus, TIS operation on 1610 kHz could continue until a primary station assignment was made that would be adversely affected by the TIS. We solicited comment on whether the TIS licensee should pay the costs of a frequency change or relocation on the basis of either actual or predicted interference to the primary AM station, or whether the licensee of the primary AM station should be responsible for such costs. We also sought comment on whether TIS stations should be authorized in the existing

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[67]The transmitter output power of a TIS using a conventional vertical antenna is limited to 10 watts. Moreover such an antenna may not exceed 15 meters (49.2 feet) in height. Alternatively, a TIS may use a "leaky" coaxial cable up to 3 km (1.9 miles) in length as an antenna. In such a case, the transmitter power is adjusted so that the field strength 60 meters (197 feet) from the cable does not exceed 2 mV/m. This corresponds to a transmitter output power of 50 watts or less.

[68]The Local Government Radio Service is one of the private land mobile radio services authorized pursuant to Part 90 of the Commission's Rules. Eligibility for operation is limited to state and local governments or various subdivisions thereof. However, stations similar to TIS may be operated by commercial entities under Part 15 of the Commission's Rules. These Part 15 stations are usually of the "leaky" coaxial cable variety and are subject to more restrictive radiation limits than TIS stations.

AM band (535-1605 kHz). Lastly, we sought comment on whether any changes in the technical assignment standards for TIS were necessary in view of probable changes being made in the standards for primary AM stations.

193. Comments. The commenters on the TIS issue fall into three categories: broadcasters, broadcast consulting engineers and TIS interests. Broadcasters[69] supported TIS operation in the expanded band on a strictly secondary basis, with TIS licensees bearing the cost of any necessary frequency changes or station relocations.[70] The consulting engineers, with one exception,[71] argued that TIS operation on any frequency between 535 and 1705 kHz should be on a secondary basis. TIS interests,[72] including TIS operators and the National Telecommunications and Information Administration (NTIA), favored a primary TIS allocation on 1700 kHz,[73] as well as secondary TIS operation on frequencies between 535 kHz and 1695 kHz.[74]

194. NTIA stated that the proposals in the Notice would jeopardize the ability of TIS to provide 24-hour service, since, in their view, operation on a secondary basis would be

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[69]The term "broadcasters" is used loosely to signify broadcast licensees and their interests. TIS-related comments were filed by the National Association of Broadcasting, the Spanish Radio Network, Westinghouse Broadcasting, Michiana Telecasting Corp., Greater Media, Inc. and Great Empire Broadcasting.

[70]As explained in the text, supra, there is a good probability that some TIS stations operating on 1610 kHz will be displaced as a result of a primary station assignment being made on that frequency. However, TIS operation on other frequencies could be subject to the same displacement, although the risk would be lower in the existing band (535-1605 kHz) where AM service has fully matured and is likely to remain more static. None of the TIS interests argued that broadcasters should bear the costs of changes in TIS facilities necessitated by primary station authorizations, although the California Department of Transportation argued that actual, rather than predicted, interference should occur before such changes are required.

[71]Cohen, Dippel and Everist, P.C. recommended that two channels be set aside for TIS in the expanded band.

[72]TIS interests filing comments were the American Association of State Highway and Transportation Officials (AASHTO), the National Telecommunications and Information Administration (NTIA), the Port Authority of New York and New Jersey, the Maryland Department of Transportation, the California Department of Transportation, the City of Port Angeles and Information Station Specialists.

[73]The Maryland Department of Transportation also favored a primary TIS allocation on 530 kHz and on either 1690 kHz or 1710 kHz.

[74]AASHTO, with the Spanish Radio Network, also proposed TIS operation in the FM band.

appropriate only for providing daytime service with nighttime service rendered unreliable due to skywave interference from AM broadcast stations operating at power levels much greater than TIS operations. NTIA stated that they would support the secondary use proposal only in conjunction with an exclusive and primary frequency allocation at 1700 kHz. NTIA also stated that the Commission's proposal would disrupt existing TIS service. NTIA believes that one of the frequencies most likely to be requested first by migrating AM broadcast stations is 1610 kHz, because many receivers currently in use in the United States can tune to 1610 kHz, while only the most recent models include the expanded band to 1700 kHz. As a result, TIS operations in urban areas would be required to move because of the large separation distance requirements and could face early disruption of service under the Commission's proposal.

195. TIS interests also requested that TIS service be augmented through the establishment of TIS service contours, co-channel distance separations and provisions which would provide greater flexibility in transmitter power and antenna selection. While none of the parties addressing the TIS issue recommended specific technical assignment standards, many noted that any standards adopted should be consistent with those applicable to primary AM stations.

196. **Discussion.** Because we have decided that the expanded band would best be used to alleviate congestion in the lower AM band, we do not believe any specific allocation of an expanded band frequency for TIS operation on a primary basis would serve the public interest. However, the support for TIS operation on a secondary basis throughout the AM band (535-1705 kHz) appears substantial. The great number of frequencies on which TIS assignment would be possible would more than offset the loss, in a few areas, of the frequency 1610 kHz.[75]

197. Whereas we acknowledge the arguments advanced by NTIA concerning the dedication of the 1700 kHz channel exclusively to TIS stations, such an action would not be consistent with the central theme of this proceeding. This would be equivalent to a "set-aside" for TIS operators, and the Commission declined to create set-asides for any specific group because of the reduced capacity for implementation of its interference reduction goals. We do not agree with NTIA's assessment that a great many TIS operations currently on 1610 kHz will be forced to move to other channels due to displacement by new AM allotments. Due to preclusions stemming from existing band operations on 1590 and 1600 kHz, the opportunities for establishing new allotments in densely populated areas will be least prevalent on 1610 kHz, thereby making that frequency the least likely of the 10 new channels to be affected in terms of any displacement. Furthermore, if TIS were to be assigned exclusively to a single channel, as NTIA has requested, adjacent channel broadcast stations could totally prevent establishment of TIS in certain markets/areas.

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[75]See Section 90.242 of the Rules in connection with the allotment plan to be developed in order to determine the continued usability of 1610 kHz in any given area.

198. Multiple channel assignment flexibility for TIS offers possibilities of locating TIS where it can function optimally, with the option of selecting a frequency with a recognized absence of interference from broadcast stations, or even to provide multiple channel coverage for a given area. If federal/state/local governments elect to do so, they could concentrate TIS operations on 1700 kHz, with 1690 and 1680 kHz as spillover or backup channels; or, any other cluster of frequencies could be chosen, if it would be helpful in supporting the establishment of a TIS identity. Therefore, we will amend Section 90.242 to permit the authorization of TIS, on a secondary basis, on any assignable frequency in the AM band. Since TIS operation is secondary to AM broadcast station operation, TIS applicants must protect broadcast assignments in the 535-1605 kHz band and allotments in the 1605-1705 kHz band. Additionally, changes will be made to Part 2, Table of Frequency Allocations, Section 2.106 of the Rules.[76]

199. We also conclude that no change should be made in the current showings required of TIS applicants.[77] While we are sympathetic to the requests of TIS interests to augment TIS service to some extent, the current record lacks the technical specifics necessary for such an action. In addition, the Notice did not contemplate any changes and consideration of such changes is beyond the scope of this proceeding. Moreover, we believe prudence requires that some period of time elapse after the new general AM technical standards are implemented so that we can determine whether the intended benefits accrue to the AM service. We expect the next several years to be a period in which significant changes are made in many AM stations' facilities. We do not believe that such a dynamic operating environment is one which is conducive to the development of enhanced technical standards for TIS. The resolution of any unique difficulties associated with the installation of a particular TIS can be handled on a waiver basis.

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[76]By international agreement, 1605-1705 kHz is now available for broadcasting. The process which led to this reallocation required an intensive long-term planning effort which was conducted on a global scale. The 1979 International Telecommunication Union World Administrative Radio Conference (WARC) allocated 1605-1705 kHz to the broadcasting service in Region 2 (the western hemisphere), giving that service an exclusive allocation of 1605 to 1625 kHz and primary status from 1625 to 1705 kHz with implementation to occur in accordance with a future regional plan. A two-session Regional Administrative Radio Conference (RARC) held in 1986 and 1988 planned the spectrum and produced the rules under which we would share this new allocation with the other nations of Region 2. Therefore, the action we take in this proceeding is merely to change the domestic table to conform to the international table and to implement the long standing decision of the United States government to use 1605-1705 kHz for broadcasting. The U.S. delegations to both the WARC and the RARC were composed of representatives from the Department of State, FCC, NTIA and industry.

[77]Because TIS will be allowed to operate on any AM channel, co-channel standards have been added to the existing adjacent channel separation criteria in Section 90.242 of the Commission's Rules.

200. Lastly, the recommendation that TIS operation be permitted in the FM band is outside the scope of this proceeding. Our experience with TIS operation in the AM band has been very satisfactory. Its location in the AM band does not appear to discourage its use. On the contrary, as a service unique to the AM band it may have some benefit in encouraging listeners to explore what other programming is being provided there. Therefore, we are not inclined to facilitate the relocation of TIS to the FM band at this time.

VIII. Receiver Model

201. **Background/Proposal.** Finally, we turn to the issue of whether receiver manufacturers should be encouraged to modify their designs for AM radios, and, if so, what form that encouragement should take. The Notice proposed to establish criteria for a "single hypothetical model" AM receiver possessing "desirable and yet affordable performance attributes" to be used as a "reference" model to induce manufacturers to "make significant improvements in the performance of AM tuners." The NRSC draft recommendations were proposed as the basis for this model.[78]

202. **Comments.** Of more than 100 comments on the Notice, 25 addressed the issue of receiver standards. They divided into essentially three groups: those who requested mandatory receiver standards that would bar the sale of non-conforming receivers; those who supported voluntary standards; and those who opposed any standards. Proponents of mandatory standards pointed to earlier Commission actions in regard to the UHF television band, where some receiver standards were mandated in an effort to facilitate UHF TV reception. NAB, CBS, Group W, Motorola, and a number of consulting engineers supported our proposal for voluntary standards. They generally agreed that higher quality receivers can aid the revitalization of AM, and that the industry should be encouraged to design and market such units as soon as possible.

203. EIA/CEG and General Motors oppose Commission involvement in the receiver issue. The EIA is working with the NAB to develop desirable AM receiver criteria, with the intention of affixing a logo to receivers meeting such criteria. General Motors argues that its AM receivers are responsive to consumer preferences and that mandating a wide-band

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[78]The NRSC recommendations describe minimum performance standards for receivers designed to complement NRSC broadcast preemphasis and filtering functions, as defined in the NRSC-1 standard. These voluntary receiver standards address two aspects of receiver performance: audio frequency response and maximum non-linear distortion. To meet the guidelines, audio frequency response must encompass 50-7500 Hz, with limits of +1.5 dB and -3.0 dB, referenced to 0 dB at 400 Hz. Receivers capable of selecting more than one bandwidth must meet this requirement for at least one bandwidth. Permissible maximum non-linear distortion must not exceed 2% (THD+N) at measurement frequencies between 50 and 7500 Hz. For a complete text of the recommendation (NRSC-3), see Appendix A of NAB comments.

receiver now would be a mistake. GM believes that advances must be made against AM band problems of noise and interference before any meaningful improvements can be achieved in receiver performance.

204. **Discussion.** We believe it to be self-evident that good receivers are essential to the success of any competitive broadcast service. Radios must be able to receive and reconstruct the program information carried on a desired radio signal, to reject interference from undesired signals on adjacent channels, and to do so with minimal distortion. This means, in part, that the receiver bandwidth should match that of the transmitted signal yet not be so broad that the receiver cannot adequately reject unwanted sideband energy from adjacent channel signals. We are persuaded by the record that a proper balance of these objectives is not achieved in most AM receivers. Receiver manufacturers have chosen to emphasize adjacent channel rejection by strictly limiting receiver bandwidths and consequently severely reducing audio fidelity.[79] The result is that, in many cases, the experience of listening to an AM receiver is comparable to using a telephone - suitable for conversation but not for music. This undoubtedly contributes to the notion that AM radio is best suited to programs favoring "talk" formats. AM broadcasters limited in their choice of formats and unable to demonstrate to their audiences that they can deliver programs competitive in technical quality with that of other aural entertainment sources will not be able to support the rich diversity and extent of broadcasting we have achieved in this country. Clearly, attention must be paid to the improvement of receivers.

205. At the same time, arguments made in the record make us wary of any suggestion to impose mandatory receiver standards. The design of radios involves many tradeoffs among performance, features and cost; a choice made to appeal to one segment of the market may be inappropriate for another or may suit circumstances in one area but not elsewhere. Further, even if we could achieve consensus on a basic set of performance characteristics, the imposition of a compulsory standard would likely raise the costs of all receivers and eliminate models with which some buyers are presently satisfied.

206. Therefore, we have determined to proceed with our proposal as outlined in the Notice to use the recommendations of the NRSC in our spectrum planning assumptions. As stated in the Notice, we intend to treat them as recommendations to the receiver industry, not

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[79]In a presentation made at a late date in the proceeding, the Commission's staff was given the opportunity to compare recordings of AM signals from past decades with those of the present. The quality of the recordings reflected the use of different receivers and implied that the better quality recordings from earlier years resulted from the use of receivers that were of better quality. Although the presentation was made after the close of the comment period in this proceeding, we note that our action continues to avoid the imposition of mandatory receiver standards. For this reason and in view of the benefit of actual comparisons between earlier and later model receivers, we have taken note of the information provided in the presentation and will make every effort to promote better quality receivers for today's AM listeners.

requirements. In a related action, the Commission encouraged AM stations to implement NRSC-1 audio pre-emphasis in addition to requiring them to comply with NRSC-2, which sets the standard for the transmitted AM signal envelope. These actions were taken to narrow the bandwidth of the transmitted signal and thereby reduce inter-station interference. A logical follow-up to that effort would appear to be the adoption by the receiver manufacturers of the NRSC-3 receiver specifications, which match receiver bandwidth characteristics to those set for transmitters. As noted above, NRSC-3 addresses only the issues of bandwidth and distortion, and makes allowances for multiple bandwidth receivers. Adoption of that standard would not interfere with manufacturers' flexibility in continuing the production of narrow bandwidth receivers, nor would it preclude the marketing of wideband receivers that do not meet the NRSC-3 standard.

207. The Commission will at appropriate intervals publish a list of those receivers that meet the NRSC-3 standard or which are comparable so that consumers can make an informed choice when purchasing AM radios.[80] We do not believe that this step will detract from the efforts of EIA and NAB in developing a list of desirable receiver design features and affixing a special logo on such receivers. Nor do we believe that this step will adversely affect General Motors (or other auto makers) in their development of improved receivers.

208. The recent adoption by the Commission of the NRSC AM emission limitations, as noted above, will reduce occupied bandwidths and thus reduce interference, and the use of NRSC-compatible receivers will complement this reduction of unwanted signals by tailoring the receiver passband to that of the transmitted signal. We do not anticipate that any significant costs will be imposed on the industry or the public as a result of this action because the receiver standard is strictly voluntary. The costs incurred by the Commission in periodically compiling and releasing a list of conforming receivers will be minimal and can be done with existing resources.

209. Although advocated by a number of commenters, we are not including in the receiver model any specifications with respect to stereophonic reception. The two most frequently suggested specifications were that: (1) any receiver capable of FM stereophonic reception should also be capable of AM stereophonic reception, and (2) all AM stereophonic receivers should be capable of receiving and decoding both the Motorola and the Kahn stereophonic transmission systems.[81] A consumer who chooses to listen to musical programming on FM and news programming on AM should not be forced to purchase a stereophonic AM receiver. Therefore, we will not mandate that AM-FM receivers capable of receiving FM stereo signals must also be capable of receiving AM stereo signals.

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[80]In making this notification, the Commission will consider the 7.5 kHz specification to be a nominal rather than minimum criteria, noting Motorola's concerns about excessive receiver cost. See Motorola comments at 29.

[81]These systems must be decoded by different circuitry.

Nevertheless, we encourage receiver manufacturers to include AM stereo reception capability with NRSC-3 performance characteristics in their receivers.

XI. Other Matters

210. The Notice included proposed rules related to the specific issues addressed in this proceeding as well as a general revision of the existing AM rules. Regarding the inclusion of the latter rules, our intent was to update, correct or clarify specific rules which had been identified over time as being particular sources of uncertainty, or as being obviously inconsistent with other rules. The commenters presented some recommendations of their own which merit consideration and are addressed below. Most comments echoed the Commission's position that the proposed revisions were indeed valuable and necessary from the standpoint of administrative accuracy.

211. A specific rule change proposed in the Notice addressed the lack of specific direction contained within Section 73.152 regarding the filing of directional antenna pattern augmentation applications.[82] The proposed language would clearly enunciate the instructions that had been longstanding Commission staff policy. The rule would now include procedures which would promote efficient use of AM spectrum and, with the aid of these instructions, eliminate numerous amendments to applications which are routinely found to be not in compliance with policy. Additionally, we have concluded, based on the majority of the comments, that directional pattern augmentation will apply to stations in the expanded band for those operations in need of this procedure where the maximum allowable radiation is not exceeded. Stations would need to consider this using this process within the context of maintaining a radiation equivalence toward other allotments or areas of protection where the value of the radiated fields do not approach the maximum allowable limits.

212. On March 29, 1990, we released an Order[83] that curtailed the filing of most applications for new or changed facilities. That action was taken so as to avoid compounding present difficulties with a continuing flow of applications based on existing, possibly inadequate, standards. We believe that such restriction upon filing applications for new and changed facilities is no longer necessary and will be removed as of seventy (70) days from the date of the adoption of this Report and Order.

213. In the Notice we stated our desire to minimize the use of directional antennas in the expanded band. In the relatively few instances that simple directional antennas would be utilized, we proposed significantly less burdensome requirements for measurement data for

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[82]See Notice at paragraph 103.

[83]5 FCC Rcd 2136 (1990)

demonstrating pattern radiation compliance by removing the measurements required by Section 73.151(a)(1)(ii) and (a)(1)(iii). Few comments were received on this matter. Some generally expressed the concern that pattern integrity could not be ensured with relaxed directional antenna measurement requirements. Lahm, Suffa and Cavell, Inc., however, support the Commission's proposals to reduce the field strength measurement burden associated with license applications. While we share commenters concerns regarding pattern integrity, we believe that those concerns are not sufficient to justify the imposition of the expensive and time consuming full proof-of-performance requirements for those expanded band permittees that will be using simple antenna systems, such as two tower directional arrays. This is especially true when one considers that the additional expense associated with a full proof-of-performance could represent the decisional factor which may prevent an otherwise willing preferred migrator from moving to the expanded band. It is not our desire to place additional burdens in the way of potential migrators unless it is absolutely necessary to prevent interference. In this regard, it is our intention that directional antennas in the expanded band employ only a mild degree of pattern suppression for the purpose of increasing the utilization of the expanded band. Interference prevention will still be accomplished by wide distance separations between stations. This is in contrast to directional antennas in the existing band that frequently utilize deep nulls for station protection in several directions in order to shoehorn a station into an already congested band. For this reason we do not feel that absolute pattern compliance is as essential in the expanded band to prevent interference as it is in the existing band. Accordingly, for simple directional antenna systems in the expanded band (those utilizing two towers), we will require measured radials only in the directions for which the proposed allotment is short spaced with another co-channel or adjacent channel allotment. In this manner, we will ensure that equivalent protection is provided to all expanded band facilities. In the rare instances where a directional antenna system in the expanded band utilizes more than two towers, we believe that such antenna systems are of sufficiently complexity to warrant the filing of the measurement data required by Sections 73.151(a)(1)(ii) and (a)(1)(iii) of the Rules. Accordingly, in the isolated instances where a directional antenna system of more than two towers is used in the expanded band, full proof-of-performance requirements will apply.

214. A number of changes will be made to Part 2, Table of Frequency allocations, Section 2.106 of the Rules[84], in addition to those described in the section on the Traveler's Information Service, to implement the AM band expansion and to modify the conditions for non-broadcast use of the band 1605-1705 kHz[85]. These changes were proposed in the Notice, were not the subject of comment and generally reflect our decision to use that band for broadcast operation while continuing to permit operation of existing non-broadcast stations

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[84]47 C.F.R. Section 2.106.

[85]These uses include mobile and radiolocation services throughout the United States and, within the band 1615-1705 kHz, include maritime mobile and fixed services in Alaska. All of these services will operate on a secondary non-interference basis with respect to broadcasting.

provided interference is not caused to broadcast stations.

X. Summary and Conclusions

215. In this Report and Order we have taken a number of major steps to improve technical standards and thus to reduce the level interference in the existing band, to encourage certain existing licensees to move into the expanded portion of the AM band, and to consolidate existing broadcasting facilities in order to further reduce congestion and interference in the existing band. We have taken these steps in order to slow or reverse the trends in this band towards rising congestion and interference and declining listening audiences. While we are aware that the actions of broadcasters and listeners will ultimately determine the future direction of AM radio, it is our belief that the changes we have made will allow broadcasters to make changes that may greatly enhance their competitive position relative to other audio outlets.

XI. Administrative Matters

216. Because we are now issuing this Report and Order and closing this docket, we will also lift the freeze on AM applications on the effective date of this Report and Order. We will begin accepting applications for major modifications of existing AM stations and applications for new AM stations in the existing AM band. Such applications will be required to comply with the new technical standards that we adopt today. Applications currently on file that have been "cut-off" will not be required to amend. All others will be given sixty (60) days from the effective date of this Report and Order to file amendments to satisfy the requirements of the revised rules.

217. In Appendix D we have described an example allotment plan for the expanded band that conforms to our new technical requirements. At a date to be specified in the future, we will announce a filing window during which existing licensees will be allowed to file petitions to operate a station in the expanded band. Such petitioners will be required to comply with all relevant technical rules.

218. In the Report and Order in MM Docket No. 89-46, 5 FCC Rcd 4492 (1990), we adopted significant revisions to our Rules and policies concerning interference reduction agreements, elimination of "grandfathering" deleted AM facilities, contingent applications, local service floor, and competing applications. In the Report and Order in MM Docket No. 88-508, 5 FCC Rcd 4482 (1990), we adopted changes to our Rules for calculating skywave field strength utilizing a new, more accurate skywave propagation model that will better depict nighttime skywave service and interference on all channels. In the Report and Order in MM Docket No. 88-510, 5 FCC Rcd 4489 (1990), we substituted new groundwave propagation curves for the current curves which will allow for better prediction of groundwave service and interference. In those actions, we specifically stated that the

effective date of the revisions would be established in this proceeding. Accordingly, we are including the appropriate language in this Report and Order.

219. Appendix B contains our Final Regulatory Flexibility Analysis.

XII. Ordering Clauses

220. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 4 and 303 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154 and 303, 47 U.S.C. Part 73 IS AMENDED as set forth below, effective seventy (70) days from the publication of this Report and Order in the Federal Register and upon OMB approval of these changes.

221. IT IS FURTHER ORDERED that the freeze currently in effect on AM broadcast station applications IS LIFTED effective seventy (70) days from the publication of this Report and Order in the Federal Register and upon OMB approval of revised FCC application Forms 301 and 302.

222. IT IS FURTHER ORDERED, That the amendments to Part 73 of the Commission's Rules adopted April 12, 1990, in MM Dockets No. 88-508, 88-510, and 89-46, ARE HEREBY MADE EFFECTIVE seventy (70) days from publication of this Report and Order in the Federal Register and upon OMB approval of those changes.

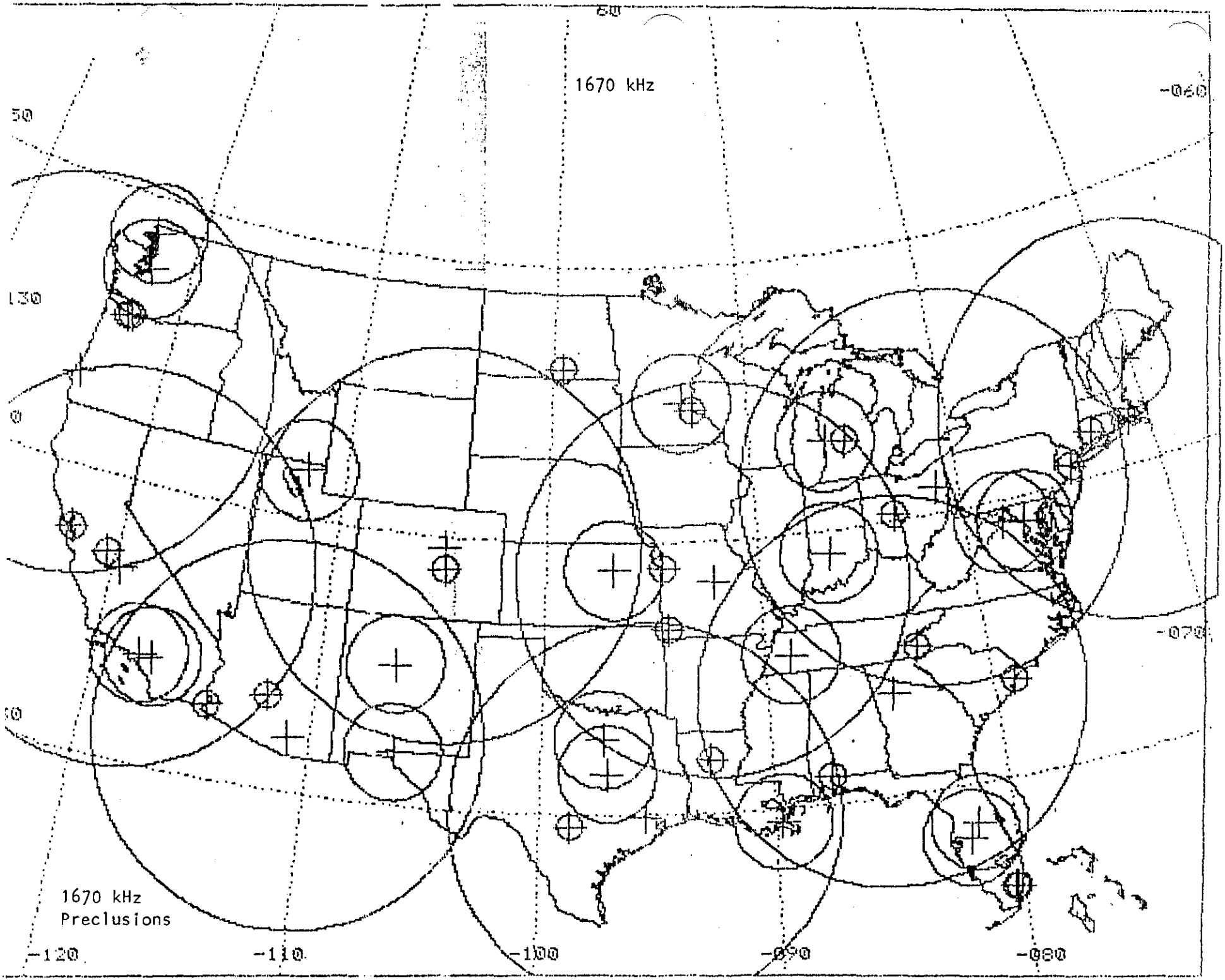
223. IT IS FURTHER ORDERED, That the petition for rule making filed May 25, 1989 by Earl J. Weinreb IS DENIED.

224. IT IS FURTHER ORDERED that MM Docket No. 87-267 IS TERMINATED.

225. Further information regarding this proceeding may be obtained by contacting Larry Olson, Mass Media Bureau at (202) 632-6955.

FEDERAL COMMUNICATIONS COMMISSION

Donna R. Searcy
Secretary


1670 kHz
1670 kHz
Preclusions
-120
-110
-100
-090
-080
-060
-070

(a)(2)(i) A statement certifying that the transmitting site of the Travelers Information Station will be located at least 15 km (9.3 miles) measured orthogonally outside the measured 0.5 mV/m daytime contour (0.1 mV/m for Class A stations) of any AM broadcast station operating on a first adjacent channel or at least 130 km (80.6 miles) outside the measured 0.5 mV/m daytime contour (0.1 mV/m for Class A stations) of any AM broadcast station operating on the same channel, or, if nighttime operation is proposed, outside the theoretical 0.5 mV/m-50% nighttime skywave contour of a U.S. Class A station. * * *

(a)(2)(ii) In consideration of possible cross-modulation and inter-modulation interference effects which may result from the operation of a Travelers Information Station in the vicinity of an AM broadcast station on the second or third adjacent channel, the applicant shall certify that he has considered these possible interference effects and, to the best of his knowledge, does not foresee harmful interference occurring to broadcast stations operating on second or third adjacent channels.

* * * * *

OLSON C:\WP51\DOCS\AM\mm87-267\R&O\LWO_R&O FINAL (10-24-91/2:30am)

$// R&O on AM Tech. Assign. Criteria, MM Dock. 87-267, FCC 91-303 //$
$/ Part 2 Frequency Allocation Radio Treaty Matters; General
Rules and Regulations /$
$/ Part 73 Radio broadcast services /$
$/ Part 90 Private Land Mobile Radio Services /$
///newjob///

APPENDIX A

List of Commenters in MM Docket No. 87-267

Comments:

3-D COMMUNICATIONS CORPORATION
ADVANCE BROADCASTING CORP., ET AL.
ALABAMA NATIVE AMERICAN BROADCASTING COMPANY
AMERICAN ASSOC. OF STATE HIGHWAY AND TRANSPORATION OFFICIALS
YORK DAVID ANTHONY
ASSOCIATION FOR BROADCAST STANDARDS, INC.
ASSOCIATION OF FEDERAL COMMUNICATIONS CONSULTING ENGINEERS
B&B BROADCASTING, INC., ET AL.
BELLEVUE SCHOOL DISTRICT
BIRACH BROADCASTING CORP.
BROADCASTING PARTNERS OF DALLAS, INC.
R. MORGAN BURROW, JR., P.E.
CALIFORNIA DEPARTMENT OF TRANSPORTATION
CALIFORNIA OREGON BROADCASTING, INC.
CAPITAL CITIES/ ABC, INC.
CAPITOL BROADCASTING COMPANY OF VIRGINIA
CAR AUDIO SPECIALISTS ASSOCIATION VEHICLE SECURITY ASSOCIATION
CBS, INC.
CHRISTENSEN BROADCAST GROUP, INC.
CHRISTIAN FAMILY NETWORK, WOLY
CITY OF PORT ANGELES, WA
CLEAR CHANNEL BROADCASTING SERVICE
COHEN, DIPPELL AND EVERIST, P.C.
CONSUMER ELEC GROUP OF THE ELECTRONIC INDUSTRIES ASSOCIATION
COX ENTERPRISES, INC.
CRAWFORD BROADCASTING COMPANY
DE LA HUNT BROADCASTING CORP.
DIAMOND BROADCASTERS, INC.
DU TREIL, LUNDIN & RACKLEY, INC.
E. HAROLD MUNN, JR. & ASSOCIATES, INC.
EBE COMMUNICATIONS LP.
ELECTRONIC INFORMATION AND EDUCATION SERVICE OF NEW JERSEY
JEFFREY EUSTIS
FIRELANDS BROADCASTING, INC.
GEORGE M. FRESE, P.E.
FULLER-JEFFREY BROADCASTING COMPANIES
GALLIMORE ELECTRONICS, INC.

GENERAL MOTORS RESEARCH CORPORATION
GLOBAL BROADCASTING SYSTEM, INC.
GOETZ BROADCASTING CORPORATION
GOLDENSTRIP BROADCASTING, INC.
GREAT EMPIRE BROADCASTING, INC.
GREATER MEDIA, INC.
GUARDIAN COMMUNICATIONS, INC.
GULF ATLANTIC MEDIA CORPORATION
H&C COMMUNICATIONS
THEODORE G. HAMMOND
HATFIELD & DAWSON, CONSULTING ENGINEERS, INC.
IDAHO STATE BOARD OF EDUCATION (BOISE STATE UNIVERSITY)
INDEPENDENT BROADCAST CONSULTANTS, INC.
INFORMATION STATION SPECIALISTS
JOHN FURR & ASSOCIATES, INC.
ROBERT A. JONES, R.P.E.
KENNETH J. JONES
KAHN COMMUNICATIONS, INC.
KEZM STEREO
KGRE(AM)
KGTN 1530 AM
KLOK RADIO, LTD.
KNOX BROADCASTING GROUP, INC.
KOLA, INC.
KQV(AM)
KSEV(AM)
KVI, INC.
LAHM SUFFA & CAVELL, INC.
LITTLE HAITI RADIO, INC.
LIVING COMMUNICATIONS OF CT.
LLOYD B. ROACH, INC.
MARINO BROADCAST ASSOCIATES
MARYLAND DEPARTMENT OF TRANSPORTATION
MICHIANA TELECASTING CORP.
MIDWEST RADIO ASSOCIATES
MOTOROLA, INC.
MULTILINGUAL COMMUNICATIONS ASSOCIATION
NATIONAL ASSOCIATION OF BROADCASTERS
NATIONAL PUBLIC RADIO
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
NEWTON-CONOVER COMMUNICATIONS, INC.
NORTH COAST RADIO, KNCR-AM
NORTHERN TELEVISION, INC.
PERSONS AND ASSOCIATES, INC.

POLNET BROADCASTING COMPANY, LTD.
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
PULITZER BROADCASTING COMPANY
QUASS BROADCASTING CO.
RADIO ELIZABETH, INC.
RADIO NEVADA, INC.
JUAN C. RODRIGUEZ
SALEM MEDIA CORPORATION
EDWARD A. SCHOBER, P.E.
FREDERICK W. SEIBOLD
SELLMEYER ENGINEERING
SENATOR JOSEPH LIEBERMAN
DOUGLAS E. SMITH
SNIDER CORPORATION
SPANISH RADIO NETWORK
TALLEY BROADCASTING CORPORATION
THE NATIONAL ASSOCIATION FOR THE ADVANCEMENT OF COLORED PEOPLE
TRIBUNE BROADCASTING COMPANY
UNITED BROADCASTING COMPANY
UNIVERSAL BROADCASTING CORPORATION
VIR JAMES P.C., BROADCAST ENGINEERING CONSULTANTS
VISION BROADCASTING COMPANY
FRED W. VOLKEN
WEST JEFFERSON BROADCASTING
WESTINGHOUSE BROADCASTING COMPANY
WEXL RADIO
WHOT, INC., AND THE JET BROADCASTING CO., INC.
WILLIAM CULPEPPER & ASSOCIATES
D.C. WILLIAMS, P.E.
WINCOM COMMUNICATINS, INC.
WKMB RADIO
WKQW RADIO
WLOI/WCOE
WMMW(AM)
WNTY(AM)
WNYC COMMUNICATIONS GROUP
WOODWARD COMMUNICATIONS, INC.
WQBB(AM)
WREF(AM)
WRIGHT STATE UNIVERSITY
WTTF INC.
YORK-CLOVER BROADCASTING COMPANY

Reply Comments:

ALABAMA NATIVE AMERICAN BROADCASTING COMPANY
BELLEVUE SCHOOL DISTRICT
BOOTH AMERICAN COMPANY
CAPITAL CITIES/ABC, INC.
CLEAR CHANNEL BROADCASTING SERVICE
COHEN, DIPPELL AND EVERIST, P.C., CONSULTING ENGINEERS
CRAWFORD BROADCASTING COMPANY
DU TREIL, LUNDIN & RACKLEY, INC.
JEFFREY EUSTIS
GREATER MEDIA, INC.
JOHN FURR AND ASSOCIATES, INC.
KAHN COMMUNICATIONS, INC.
KPSA RADIO
KARL D. LAHM, P.E.
LAHM, SUFFA & CAVELL, INC., CONSULTING ENGINEERS
LAMBERT & ANTHONY, CONSULTING ENGINEERS
R.J. MORAN
NATIONAL ASSOCIATION OF BROADCASTERS
RADIO ELIZABETH, INC.
THE TEN EIGHTY CORPORATION, ET AL.
D.C. WILLIAMS

Appendix B

Final Regulatory Flexibility Analysis

I. Need and Purpose of this Action:

1. The action is taken to update the current, antiquated AM broadcast rules, and make them more germane to an increasingly technologically advanced broadcasting industry. Our ultimate goal is to rejuvenate AM radio's competitive edge and thus revitalize its role in broadcast competition.

II. Summary of Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis:

2. No comments were received addressing the Initial Regulatory Flexibility Analysis.

III. Significant Alternatives Considered and Rejected:

3. The commenters suggest a variety of alternatives to the proposed change of the baseline nighttime protection contour for those stations in the new Class B category to uniformly protect the 2.0 mV/m contour. These alternatives range from retaining the present rule to expanding the proposal to offer protection to higher values of field strength, particularly for daytime protected contours. We adopt the original proposal because we continue to believe that it best advances the goals and objectives of this proceeding, taking into consideration the unique operating situation of individual AM stations.

4. Several commenters ask that we revise the current values utilized for E_{min} and noise. Some of these commenters claim that the present values afford interference protection to signals which are too weak to provide any meaningful quality service. Others maintain that dramatic urbanization has significantly increased both man-made noise and AM signal attenuation, necessitating higher signal strength values to provide a comparable level of service. Still other commenters cite the temporal and geographic complexities illustrative of the difficulties in attempting to select a single appropriate value for E_{min}. These difficulties indicate that the selection of any other protected contour value would not, on balance, provide a more accurate benchmark and so we retain the values of minimum usable field strength, E_{min}.

5. The Notice proposed no change to the co-channel protection ratio. For the first adjacent channel, the Notice proposed to changed the ratio to 16 dB for the protection of groundwave service and 0 dB for skywave service, and for the second and third adjacent channel, no change. The commenters overwhelmingly support no change of the current

protection ratio, few comments deal with second and third adjacent channel protection, and no commenters address the specific subject of providing 0 dB adjacent channel protection to nighttime skywave services. We agree with the commenters proposing a first adjacent channel protection ratio of 6 dB, to be applied at the 0.5 mV/m contour. This value is more appropriate than the 16 dB originally proposed. As demonstrated in the comments, the adoption of 16 dB of additional protection at the 0.5 mV/m contour would largely preclude needed facilities modifications, thus effectively freezing the AM band at the current level of adjacent channel interference. The ratio adopted is more appropriate to the needs of wide-band reception without the need for such a freeze. Our position on second adjacent channel protection levels has also changed since adoption of the Notice. We now consider that change is required. However, the value proposed by some commenters, 2 mV/m overlap prohibition, is too restrictive a method of providing second adjacent channel protection. Therefore, we adopt a prohibition of overlap of the 5 mV/m contours of second adjacent channel stations. In so doing, we ensure that, within the daytime city coverage contours, full protection from second adjacent channel interference will be obtained.

6. The Notice proposed tightening the existing protection criteria by elimination of present RSS 50% exclusion methodology and replacing it with: (for new or changed facilities) a requirement that each station's individual limitation toward any other station not exceed 1.0 mV/m. Existing stations making changes that already exceed this threshold would need to reduce their signal to other stations by 10%; first adjacent channel signals would be included in calculations of service areas and new contributions would be evaluated for acceptable level; and RSS calculations would include all contributions and have significance only for coverage purposes. The commenters generally oppose the use of the proposed methods citing the resultant lack of flexibility for stations that may attempt to make any necessary changes or any type of upgrade. Those who oppose the RSS O% exclusion proposal note the resultant diminution of service area when additional contributions from co-channel and adjacent channel stations are included in the RSS calculation. A number of these commenters recommend as an alternative that RSS calculations be performed using a RSS 25% exclusion method. Those who support the proposals contained in the Notice as well as the 1 mV/m and single signal concepts generally ask that the entire process include some degree of flexibility for cases that involve circumstances that are beyond the control of the licensees. We agree that in certain instances which might lie beyond the applicant's control, occasions may arise when the 10% reduction would not be possible. In these situations, we would allow for some flexibility for exceptional cases where reduction could not be performed without the waiver of other technical requirements. The proposal adopted strikes the best balance between the ideals of mathematical accuracy and interference reduction and the business of operating a radio station in the AM band.

7. We considered three options regarding city coverage requirements: (1) to require that expanded band stations have more than 50% city nighttime coverage; (2) to adopt, as proposed in the Notice a required nighttime coverage of 50% of the principal community by the 5 mV/m or the interference-free contour, whichever is greater; and (3) to adopt a modified version of option 2 that would clarify that 50% coverage will be acceptable

only for migrating stations not proposing to change their city of license. We enact option 3 because adoption of a rule that would allow a broader scope of action is beyond the goals of this proceeding and because it improves on the option suggested in the Notice by clarifying that the proposed rule was intended only to facilitate migration and not to permit changes in the city of license precluded by the current rule.

8. The third prong of our decision involves the migration of existing AM stations to the expanded band. In that regard, commenters offer several suggestions for different migration preference factors as alternatives to the priority scheme proposed in the Notice and adopted (with some modification) in this decision. Some parties hold that the proposed scheme would offer the least incentive to migrate to the stations the Commission would most like to attract to the expanded band. Those stations are older, well established nighttimers, which cause the most interference, but also have the largest coverage areas. Thus, these parties recommend that preferences should go to stations with high nighttime RSS's and small interference free service areas. We dismiss this proposal because stations that have high nighttime interference free contours, in most cases, cause the least amount of interference to other existing stations. Other commenters urge that the FCC switch its emphasis to service provided, and submit some alternative ratios that they believe represent more appropriate factors. Another commenter asks that first local service be given a preference before others, and still others propose that TIS users be assigned to 1690 and 1700 kHz, and an additional two full channels be set aside for educational broadcasters. We adopt the priority scheme basically as proposed, because we believe that revising that scheme through an emphasis on stations receiving interference as opposed to stations causing interference would be counterproductive because it would stray from our goal in this proceeding, to reduce congestion and interference in the AM band. Making a specific allocation to TIS on 1690 and 1700 kHz would impair the expanded band's ability to accommodate preferred migrators. We defer to the commenters, though, who support a daytime interference factor, and adopt a revised improvement factor scheme which incorporates a preference factor for daytime interference caused in addition to the proposed factor for nighttime interference.

9. We reviewed three possible options concerning Travelers Information Stations, which are authorized to operate at 1610 kHz, 10% of the expanded AM band. The first option would allow TIS operation in the expanded band on a strictly secondary basis, with TIS licensees bearing the cost of any necessary frequency changes or stations relocations. The second option would authorize TIS operation on any frequency between 535 kHz and 1705 kHz on a secondary basis. The final option favored a primary TIS allocation on 1700 kHz, as well as TIS operation on frequencies between 535 kHz and 1705, and that TIS service be augmented through the establishment of TIS service contours, co-channel distance separations and provisions. We elect to allow TIS operation on a secondary basis through the AM band (535 kHz to 1705 kHz) because the loss, in some areas, of the 1610 kHz frequency would be offset by the great number of frequencies available for TIS assignment. We do not believe that any specific allocation of an expanded band frequency for TIS on a primary basis, such as suggested in option three, would be in the public interest. We also find that no change should be made in the current TIS assignment standards because of the lack of a

record supporting such a change. We further conclude that authorization of TIS operation is beyond the scope of this proceeding.

10. Three possible scenarios were considered for the planning method for development of the expanded band, allotment planning, assignment planning, and the flexible method proposed in the Notice. Given the lack of comment on this issue, we chose the flexible allotment plan as originally proposed.

11. The Notice sought comment on possible reimposition of an AM-FM program nonduplication rule. The Report and Order does not adopt an AM-FM program nonduplication rule. The Commission will revisit the issue after three years.

Appendix C

RSS Illustration

The calculation of nighttime skywave interference to a station (other than a Class I station) from multiple interfering sources is done by the Root-Sum-Square (RSS) method. The RSS method calculates the square-root of the sum of the squares of the individual limits on service imposed by each interfering signal and is shown mathematically as follows:

$$RSS = \sqrt{L_1^2 + L_2^2 + L_i^2 + \ldots + L_n^2}$$

Where: n is the total number of stations
$i = 1, 2, \ldots, n$
L_i is the limit from the ith station

Each individual limit is obtained by determining the field strength of the interfering skywave signal radiated by one station at the transmitter site of the station receiving interference and then multiplying the results by the co-channel (20:1) or adjacent channel (2:1) protection ratio, as appropriate.

The following example illustrates the use of the RSS method and, particularly, the application of this method with respect to the rules adopted in this proceeding. In the example, Station A receives interfering signals from Stations 1 through 20. The interfering effects of each station are considered in order of decreasing magnitude. The actual RSS is composed of all the interfering signals and is called the RSS 0% exclusion value since no signals are excluded from the calculations. Applying a 50% exclusion principle to the RSS calculation means that each succeeding signal is compared to the Running RSS and if it is less than 50% of the Running RSS its value is excluded from the RSS. The same reasoning applies to use of the RSS 25% exclusion method. The use of the exclusion principle places greater weight on the higher value signals and simplifies the calculations, an important point years ago when the RSS methods were first developed and inexpensive computers were not available.

In the example shown below Station A receives interference from the interfering skywave signal of Station 1, a value determined to be 0.6065 mV/m calculated at the transmitter site of Station A. Multiplying this value by the co-channel protection ratio gives:

$$L_1 = 0.6065 \times 20 = 12.13 \text{ mV/m}$$

This means that Station A is limited by the interference from Station 1 to service inside its 12.13 mV/m contour. Said another way, Station 1 imposes a limit on Station A of 12.13

mV/m. The Running RSS column shows the cumulative effect of multiple interferers. The collective effect of Stations 1, 2 and 3 is to limit Station A to service inside its 16.67 mV/m contour.

Interference to Station A

Station #	Limit (mV/M)	Running RSS (mV/m)
1	12.13	12.13
2	8.62	14.88
3	7.51	16.67
4	7.13	18.13
5	6.41	19.23
6	5.95	20.13
7	5.25	20.80
8	4.31	21.24
9	3.52	21.53
10	2.90	21.73
11	2.13	21.83
12	1.67	21.90
13	1.43	21.94
14	1.16	21.97
15	0.93	21.99
16	0.86	22.01
17	0.81	22.02
18	0.72	22.04
19	0.64	22.05
20	0.53	22.05

The following figure graphically illustrates the effect of the above interfering signals on Station A. For instance, when all signals are considered, Station A is limited to the 22.05 mV/m contour. If RSS 50% exclusion is used, Station A is limited to the 16.67 mV/m contour. If RSS 25% exclusion is used, Station A is limited to the 20.80 mV/m contour. As shown on the graph, the top three contributors who are included in the RSS 50% exclusion calculation would be required to reduce radiation in the direction of Station A by 10% in order to modify their facilities. The next four, falling between the 50% and 25% values, would be required to maintain their signal levels in order to modify their facilities. Finally, the remaining contributors would be able to increase their radiation, but only up to the 25% line. In an established service, however, few if any of these stations would be able to raise their individual limits by a significant amount because of the need to protect stations other than Station A. For example, Station #19 may be the principal contributor of interference to Station #14 and therefore might be unable to increase its nighttime radiation.

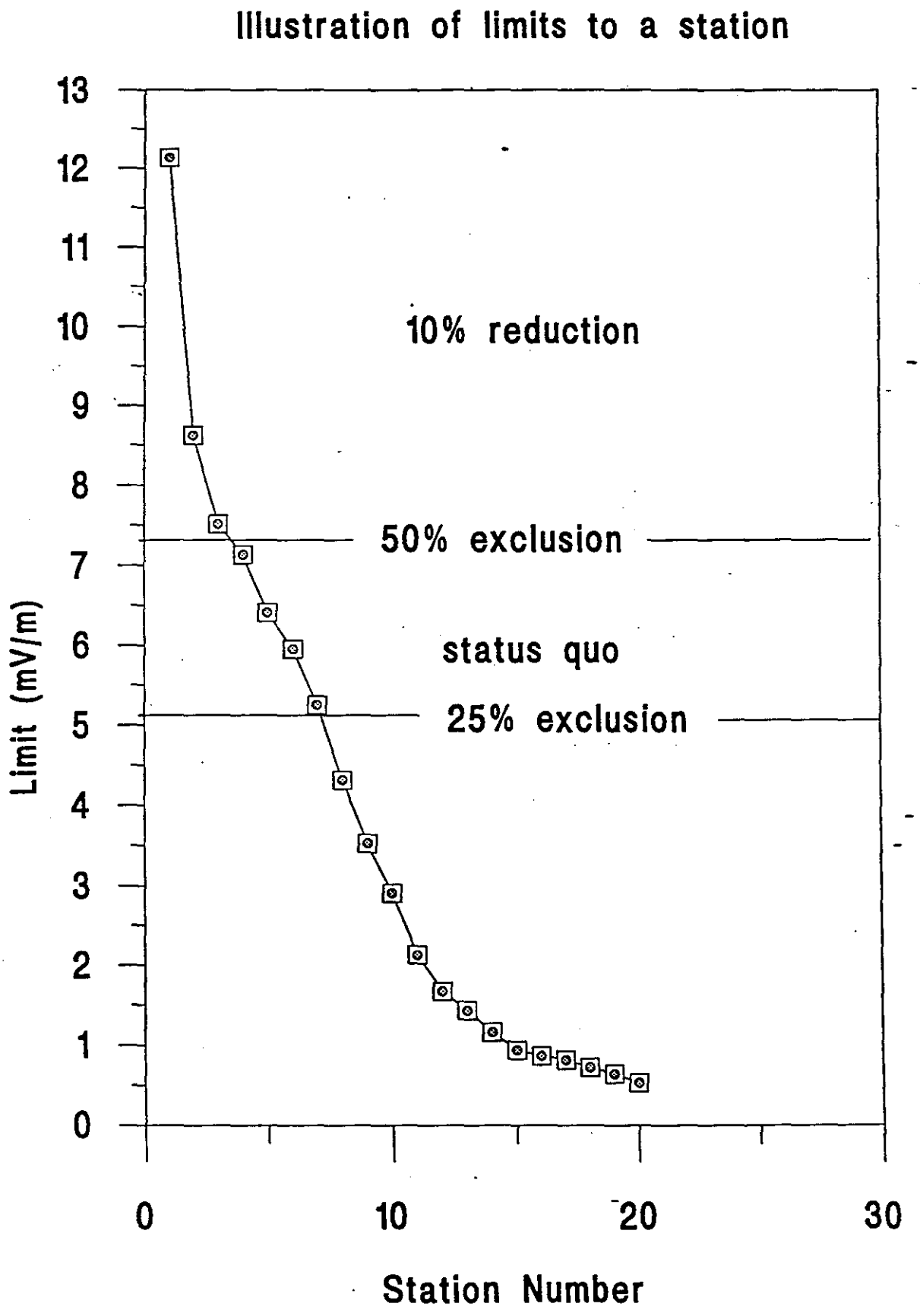


Illustration of limits to a station
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Limit (mV/m)
10% reduction
50% exclusion
status quo
25% exclusion
0
10
20
30
Station Number

Appendix D

SAMPLE PLAN FOR THE ALLOTMENT OF THE EXPANDED BAND

The attached sample allotment plan for the expanded band was developed using most of the procedures and computer methodology that will be in effect when the frequencies are actually allocated. Exceptions to the actual steps to be used in the final allotment scheme are noted below. This sample plan is presented purely as an illustration of the techniques that will be used at a later time in developing the allotment scheme for the final plan. The results included here do not prejudice or have any bearing on the outcome of the actual plan to be developed at a future time.

The 361 letters of intent received in response to the Notice were individually evaluated and classified according to the station's operating status, e.g., fulltime, daytime-only and Class IV. An improvement factor (IF) which represents the extent of improvement in the existing band if they were to migrate to the expanded band (See para. 125 of the Report and Order) was then calculated for each station participating in the survey. The individual stations were then sequentially ranked from the highest to the lowest based on the values of their corresponding improvement factors. The methodology utilized to develop this sample plan, and eventually, the determination of actual allotments in the final plan, represent the best practical solution to the task of awarding and distributing the expanded band spectrum. No comments were received in this proceeding which suggested any detailed procedure by which the allotments could be efficiently distributed geographically.

PROCEDURE

Starting with the station with the highest improvement factor value, whenever its location was not precluded from receiving an allotment, that station was assigned a frequency starting from the lowest serviceable channel (1610 kHz, if possible). To place each additional allotment, a computerized positioning routine was used to test every available combination of frequency/location distribution for all the allotments already selected until a suitable fit was obtained. This was done in order to find a location/frequency for the station in the list with the next highest improvement factor. When, despite computerized manipulation of the previously allotted stations, a location was considered for which no frequency was available, that letter of intent was removed from further consideration and the next highest improvement factor was then subjected to the searching and adjusting process.

The study was run under the following set of conditions:

SPACING CRITERIA:

- Co-channel: 800 kilometers
- 1st adjacent channel: 200 kilometers
- 2nd adjacent channel: 53 kilometers
- 3rd adjacent channel: no spacing restrictions were used for this study.

DATA BASE USED:

The data base records used in the sample plan analysis consisted of the following selected records from the FCC's AM Engineering Data Base dated July 2, 1991. The records used for improvement factor calculations as well as for protection of existing authorizations on 1580, 1590 and 1600 kHz were as follows:

(1) U.S. license records (Those records that showed domestic status of II-S or III-S but had an antenna RMS greater than 141 mV/m were also included).

(2) Canadian and Bahamian operational records.

(3) Mexican operational records except those from Change List 298 or later that are not acceptable.

PRIORITIZATION:

The letters of intent were divided into the following four groups of descending priority:

(1) Full-time stations - for purposes of this study, those with a record indicating nighttime operation in the above-mentioned data base.

(2) Daytime-only stations that were licensed to a community of over 100,000 population, without any local nighttime aural service and which were located within the 0.5 mV/m-50% nighttime skywave contour of a Class I station.

(3) All other daytime-only (new Class D) stations.

RANKING OF STATIONS:

Stations were ranked based on the following:

(1) Full-time stations - the nighttime improvement factor was calculated.

(2) Daytime-only and local channel stations - no improvement factors were available at this time. Stations were considered in alphabetical state/city order.

Due to time constraints, certain programming routines are still in the development stage. Therefore, some elements of the final procedure are not included in this sample allotment plan. Exceptions pertinent to this sample study are as follow:

(1) International allotment prioritization criteria was suppressed for this sample plan.

(2) Improvement factors for daytime interference were not used in the ranking process.

(3) Only the 48 conterminous states were considered in this exercise.

(4) Data base records were not scrutinized for complete accuracy or applicability to this study. As an example, the ranking associated with station WKCM is affected by the inadvertent inclusion of the limited-time record of WJJD, Chicago, IL within the nighttime study, thereby skewing its standing in the ranking process.

(5) The above mentioned spacings were used when considering existing band assignments on 1590 and 1600 kHz. During the actual allotment planning process, actual service contours of these stations will be considered and their distances calculated to guarantee their full protection.

The study reveals that locations with the potential for additional expanded band allotments are available. Letters of intent were not submitted for these particular locations. We note that the unused portion of this resource could provide greater benefits from the use of its full capacity. Moreover, other petitioners might have been accommodated with additional allotments, had the use of simple directional antennas been incorporated in this study. The plan as shown here was designed with no attempt made to alter the basic spacing criteria that are specified above although that is an option we plan to use for developing the actual allotment plan. The results of this preliminary study show that 95 of the 361 letters of intent are accommodated by the sample allotment plan.

MAPS

The attached maps depict the distribution of the allotments that were selected in this sample study. A map is included for each of the 10 expanded band frequencies. Additionally, 10 maps are presented to illustrate the preclusive impact each channel and include the effect of the existing band operations on 1590 and 1600 kHz. Each of the 10 maps for the frequencies 1610-1700 kHz illustrates the occupancy of that channel and includes the following features:

(1) The allotments assigned to the subject frequency circumscribed by their 800 km radii of preclusion for other co-channel allotments.

(2) The allotments assigned to the two channels first adjacent to the subject channel and the area of preclusion described by their 200 km spacing radii.

(3) The allotments assigned to the two channels second adjacent to the subject channel and the area of preclusion described by their 53 km spacing radii.

Also attached are several maps depicting the relative nighttime coverage areas of present licenses versus those which would result in the expanded band given the allotments made in this study. As is indicated by these illustrations, in most cases, substantial improvements in coverage can be expected, however, there are some cases where the improvement would appear to be marginal, and one case where the movement to the expanded band would not be beneficial.

EXPANDED BAND SAMPLE ALLOTMENT PLAN
STATION RECORDS LISTING

(Note: IF represents the Improvement Factor)

Rank	IF	Allot	Freq.	Call	Location	Coordinates
Full-time Stations:						
1	12.50	1640	1160	WKCM	KY HAWESVILLE	37-54-20N 86-45-30W
2	10.19	1620	1010	WMOX	MS MERIDIAN	32-23-42N 88-39-28W
3	6.63	1680	1420	KRIZ	WA RENTON	47-26-25N 122-12-09W
4	6.41	1650	680	WRGC	NC SYLVA	35-23-35N 83-11-38W
5	4.88	1650	1380	WPLB	MI GREENVILLE	43-09-18N 85-15-25W
6	4.82	1690	1590	WGYJ	AL ATMORE	31-02-12N 87-29-42W
7	4.82	1680	610	WUSQ	VA WINCHESTER	39-11-53N 78-13-13W
8	3.90	1700	1480	KRED	CA EUREKA	40-44-28N 124-12-05W
19	3.86	1680	1430	WLKF	FL LAKELAND	28-02-27N 81-56-08W
10	2.93	1630	1360	WKMI	MI KALAMAZOO	42-19-36N 85-31-39W
11	2.53	1690	1590	WQQW	CT WATERBURY	41-35-27N 73-02-34W
12	2.48	1640	1590	WCBG	PA CHAMBERSBURG	39-54-15N 77-39-45W
13	2.47	1680	1390	WTJS	TN JACKSON	35-38-46N 88-49-57W
14	2.27	1680	1600	WSNZ	MI MUSKEGON	43-11-50N 86-13-22W
15	2.26	1660	970	KHVN	TX FORT WORTH	32-47-56N 97-17-43W
16	2.20	1640	1150	WNDB	FL DAYTONA BEACH	29-14-06N 81-04-19W
17	2.10	1620	550	WSVA	VA HARRISONBURG	38-27-04N 78-54-29W
18	1.77	1630	1040	WHBO	FL PINELLAS PARK	27-50-50N 82-46-21W
19	1.73	1680	1420	KJCK	KS JUNCTION CITY	39-01-33N 96-48-36W
20	1.69	1690	1420	KBTN	MO NEOSHO	36-50-52N 94-19-12W
21	1.57	1640	920	KBNA	TX EL PASO	31-45-41N 106-26-14W
22	1.52	1700	550	KBOW	MT BUTTE	45-58-30N 112-34-18W
23	1.41	1660	1600	WXTO	FL WINTER GARDEN	28-34-06N 81-31-09W
24	1.38	1700	570	WGMS	MD BETHESDA	39-02-07N 77-10-11W
25	1.32	1660	1600	WINX	MD ROCKVILLE	39-05-51N 77-09-07W
26	1.31	1670	1380	WAOK	GA ATLANTA	33-45-36N 84-28-45W
27	1.24	1670	1420	WBSM	MA NEW BEDFORD	41-39-02N 70-54-58W
28	1.24	1700	930	KBFW	WA BELLINGHAM-FERNDA	48-47-52N 122-28-01W
29	1.15	1670	1310	WDPN	OH ALLIANCE	40-55-34N 81-07-41W
30	1.13	1700	920	KARN	AR LITTLE ROCK	34-46-20N 92-14-45W
31	1.09	1670	950	KLIK	MO JEFFERSON CITY	38-31-13N 92-10-42W
32	1.09	NONE	1200	WAGE	VA LEESBURG	39-07-25N 77-37-31W
33	1.07	1690	1270	WUCO	OH MARYSVILLE	40-14-46N 83-19-50W
34	1.05	1620	1140	KCMJ	CA PALM SPRINGS	33-51-39N 116-28-20W
35	1.04	1630	920	WPTX	MD LEXINGTON PARK	38-16-57N 76-33-35W
36	1.02	1650	1590	WERA	NJ PLAINFIELD	40-34-39N 74-24-10W
37	1.01	1660	1370	WGCL	IN BLOOMINGTON	39-11-25N 86-38-02W
38	.99	NONE	1380	WQHK	IN FORT WAYNE	41-00-10N 85-05-50W
39	.95	1700	1440	WPRD	FL WINTER PARK	28-35-18N 81-22-53W
40	.93	1700	1270	WCMR	IN ELKHART	41-37-18N 85-57-37W
41	.89	NONE	1520	WQWQ	MI MUSKEGON HEIGHTS	43-08-28N 86-14-50W
42	.88	NONE	1430	WXKS	MA EVERETT	42-24-11N 71-04-29W
43	.88	NONE	1380	WSYB	VT RUTLAND	43-35-35N 72-59-25W
44	.87	NONE	1460	WPON	MI PONTIAC	42-36-23N 83-17-28W
45	.85	1690	1550	KMXI	WA VANCOUVER	45-38-47N 122-30-51W
46	.83	1620	920	KQEU	WA OLYMPIA	47-01-52N 122-51-10W
47	.81	1680	1440	KDIF	CA RIVERSIDE	34-01-37N 117-21-27W
48	.79	NONE	980	WONE	OH DAYTON	39-40-03N 84-10-01W
49	.72	NONE	1260	WNDR	NY SYRACUSE	43-01-32N 76-03-55W
50	.72	NONE	1550	WCTZ	TN CLARKSVILLE	36-32-12N 87-22-24W
51	.70	NONE	1600	WGIV	NC CHARLOTTE	35-14-57N 80-51-41W
52	.70	1620	920	KQEO	NM ALBUQUERQUE	35-06-36N 106-40-04W
53	.65	1630	1590	KOGO	CA VENTURA	34-14-12N 119-12-11W

Rank	IF	Allot	Freq.	Call	Location	Coordinates
54	.59	NONE	1470	WTTR	MD WESTMINSTER	39-34-37N 77-01-21W
55	.59	1640	1600	KBOR	TX BROWNSVILLE	25-56-57N 97-33-15W
56	.58	NONE	1250	WARE	MA WARE	42-14-41N 72-12-30W
57	.58	1690	1270	WYAK	SC SURFSIDE BEACH-GA	33-34-32N 79-02-29W
58	.57	NONE	1330	WYWR	OH CAMPBELL	41-05-26N 80-36-56W
59	.54	1620	1020	KRAD	OK PERRY	36-15-35N 97-13-01W
60	.50	1670	790	KOQO	CA CLOVIS	36-50-39N 119-41-13W
61	.50	1680	1460	WACO	TX WACO	31-31-01N 97-06-38W
62	.49	1620	1440	WBCI	IL NORMAL	40-25-25N 88-52-30W
63	.48	1690	1460	KKCS	CO COLORADO SPRINGS	38-49-36N 104-44-30W
64	.44	1700	1300	KAZN	CA PASADENA	34-09-38N 118-04-46W
65	.43	NONE	1300	WERE	OH CLEVELAND	41-20-28N 81-44-29W
66	.43	1660	1390	KLGN	UT LOGAN	41-44-04N 111-51-13W
67	.42	1670	1210	KQTL	AZ SAHUARITA	32-02-04N 110-56-45W
68	.41	1670	1150	KFRR	CO ENGLEWOOD	39-36-18N 104-50-25W
69	.41	NONE	1320	WSCR	PA SCRANTON	41-26-25N 75-40-30W
70	.40	NONE	1600	WUNR	MA BROOKLINE	42-17-20N 71-11-22W
71	.40	NONE	1320	WKAP	PA ALLENTOWN	40-37-40N 75-29-09W
72	.40	1680	690	KHEY	TX EL PASO	31-58-11N 106-21-15W
73	.40	1660	790	KGMI	WA BELLINGHAM	48-43-09N 122-26-43W
74	.40	NONE	1440	WNFL	WI GREEN BAY	44-28-40N 88-00-00W
75	.39	1620	1300	WXXU	FL COCOA BEACH	28-20-38N 80-46-06W
76	.39	1680	1310	WLOB	ME PORTLAND	43-41-22N 70-20-06W
77	.38	NONE	1470	WQSN	MI KALAMAZOO	42-14-11N 85-34-37W
78	.38	NONE	1260	WRDZ	OH CLEVELAND	41-17-10N 81-38-34W
79	.37	NONE	1600	WWRL	NY NEW YORK	40-47-44N 74-03-18W
80	.37	NONE	1590	WAKR	OH AKRON	41-01-14N 81-30-20W
81	.37	1640	1430	KQLL	OK TULSA	36-14-10N 95-56-50W
82	.36	NONE	600	WTAC	MI FLINT	42-56-23N 83-37-41W
83	.35	NONE	1600	WCWC	WI RIPON	43-49-01N 88-50-49W
84	.33	NONE	1570	WKBH	WI HOLMEN	43-55-32N 91-16-02W
85	.32	NONE	960	WLV	MD SALISBURY	3-82-54N 7-53-72W
86	.32	NONE	1310	WMTG	MI DEARBORN	42-15-50N 83-15-14W
87	.30	NONE	1600	WKEN	DE DOVER	39-10-11N 75-33-13W
88	.30	NONE	1460	WFYV	FL JACKSONVILLE	30-19-40N 81-44-49W
89	.30	NONE	1390	WCSE	SC CHARLESTON	32-49-26N 80-00-06W
90	.29	1650	560	KBLU	AZ YUMA	32-43-25N 114-38-39W
91	.29	NONE	1430	WFOB	OH FOSTORIA	41-06-11N 83-24-00W
92	.28	NONE	1170	KSTT	IA DAVENPORT	41-23-22N 90-31-08W
93	.28	NONE	1570	WILO	IN FRANKFORT	40-16-40N 86-29-07W
94	.27	NONE	910	WNEZ	CT NEW BRITAIN	41-42-58N 72-48-38W
95	.27	1650	1190	KJLA	MO KANSAS CITY	39-03-49N 94-30-37W
96	.26	NONE	1460	WGNA	NY ALBANY	42-37-21N 73-48-09W
97	.25	NONE	1410	WING	OH DAYTON	39-40-56N 84-09-33W
98	.25	NONE	1170	WWVA	WV WHEELING	40-06-07N 80-52-02W
99	.24	NONE	800	WTMR	NJ CAMDEN	39-54-33N 75-06-00W
100	.21	1630	1070	WDIA	TN MEMPHIS	35-16-05N 90-01-03W
101	.21	1670	1010	KLAT	TX HOUSTON	29-55-06N 95-30-58W
102	.20	1650	1480	KBMS	WA VANCOUVER	45-36-06N 122-43-06W
103	.19	NONE	1410	WNCQ	NY WATERTOWN	43-57-08N 75-52-33W
104	.19	NONE	1580	WVKO	OH COLUMBUS	40-02-50N 83-03-44W
105	.19	1630	1350	KCOR	TX SAN ANTONIO	29-31-27N 98-37-05W
106	.18	NONE	1280	WKQG	NY ROCHESTER	43-05-54N 77-35-00W
107	.16	1630	960	KALE	WA RICHLAND	46-14-34N 119-10-48W
108	.15	NONE	1570	WRHD	NY RIVERHEAD	40-54-48N 72-39-16W
109	.14	NONE	1380	WAMS	DE WILMINGTON	39-48-12N 75-37-42W
110	.14	NONE	1350	WBSK	VA PORTSMOUTH	36-53-00N 76-22-22W
111	.14	1640	1050	KBLE	WA SEATTLE	47-34-35N 122-21-52W
112	.12	NONE	920	WTTM	NJ TRENTON	40-15-19N 74-51-44W
113	.11	1660	770	KKOB	NM ALBUQUERQUE	35-12-09N 106-36-41W

Rank	IF	Allot	Freq.	Call	Location	Coordinates
114	.10	1690	1580	KLOQ	CA MERCED	37-17-31N 120-26-03W
115	.08	1660	1570	KYCR	MN GOLDEN VALLEY	44-59-51N 93-21-10W
116	.07	1650	1310	KDIA	CA OAKLAND	37-49-27N 122-19-10W
117	.06	1650	940	WINZ	FL MIAMI	25-57-36N 80-16-13W
118	.04	NONE	1510	WLAC	TN NASHVILLE	36-16-15N 86-45-24W
119	.04	NONE	660	KSKY	TX BALCH SPRINGS	32-45-02N 96-41-41W
120	.04	1690	1160	KFHM	TX SAN ANTONIO	29-32-11N 98-41-08W
121	.02	1660	1020	KTNQ	CA LOS ANGELES	34-02-00N 117-59-00W
122	.02	1690	710	WAQI	FL MIAMI	25-58-07N 80-22-44W
123	.01	NONE	1580	WSRF	FL FORT LAUDERDALE	26-04-54N 80-13-34W
124	.00	1640	540	KJQI	CA HESPERIA	34-31-13N 116-56-24W
125	.00	NONE	940	KFRE	CA FRESNO	36-29-20N 119-19-33W

Daytimers within 0.5 mV/m-50%, no aural, and pop. > 100,000:

126	NONE	1530	WJDM	NJ ELIZABETH	40-41-25N	74-15-40W

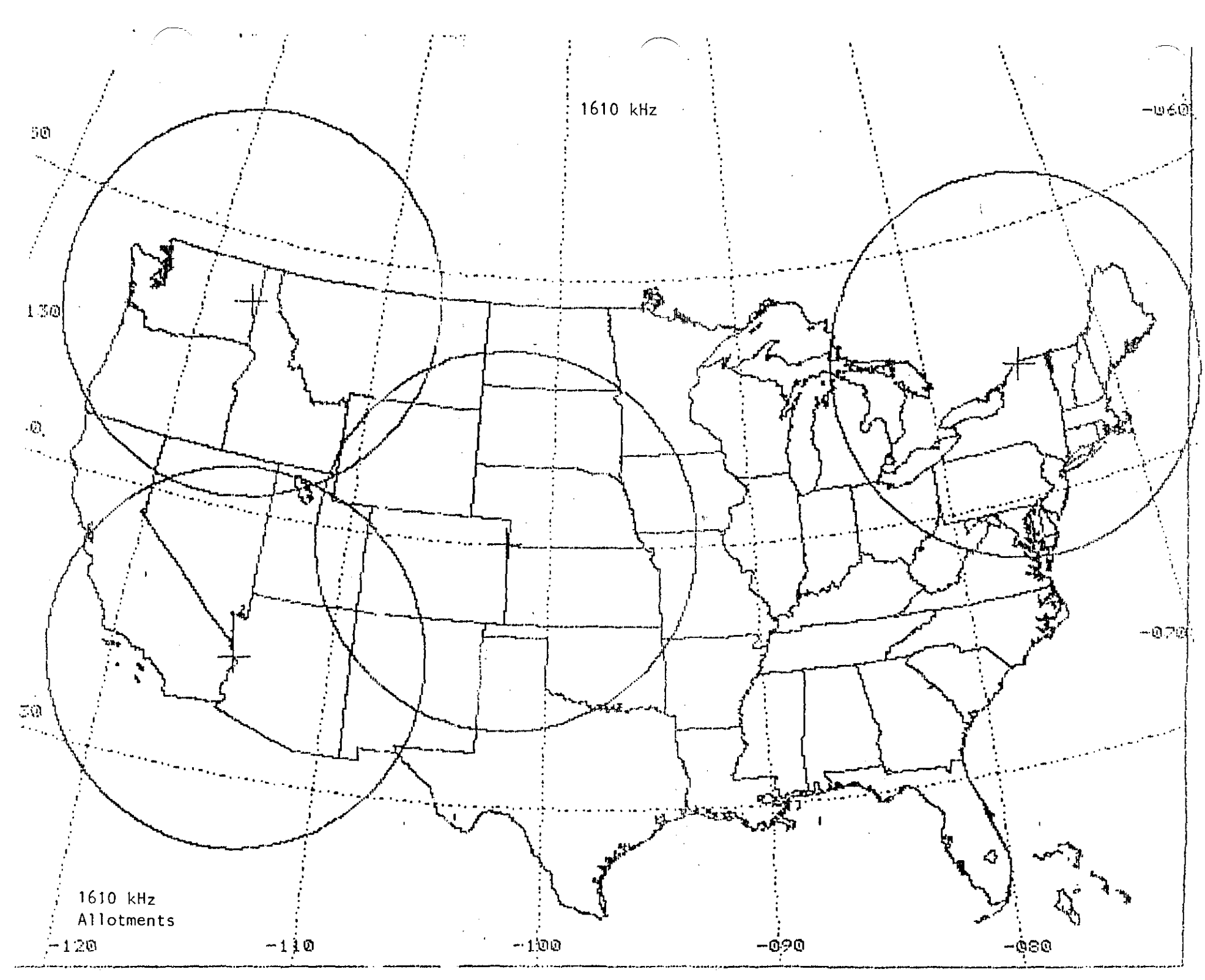
Other daytimers:

127	NONE	1480	WARI	AL ABBEVILLE	31-35-17N	85-16-51W
128	NONE	1080	WLVN	AL BRANTLEY	31-41-12N	86-16-02W
129	NONE	1560	WRDJ	AL DALEVILLE	31-16-35N	85-45-54W
130	NONE	1200	WFSF	AL OZARK	31-23-46N	85-30-01W
131	NONE	1510	KVOG	AR GREENWOOD	35-12-12N	94-16-41W
132	NONE	1420	KXOW	AR HOT SPRINGS	34-27-19N	93-03-26W
133	1630	1270	KDJI	AZ HOLBROOK	34-53-55N	110-11-30W
134	1610	980	KFWJ	AZ LAKE HAVASU CITY	34-29-41N	114-20-59W
135	1690	1540	KASA	AZ PHOENIX	33-26-54N	112-04-24W
136	NONE	1550	KUAT	AZ TUCSON	32-13-18N	110-55-33W
137	NONE	1310	KIQQ	CA BARSTOW	34-54-51N	117-00-59W
138	NONE	1410	KRML	CA CARMEL	36-32-11N	121-54-13W
139	NONE	1430	KAMP	CA EL CENTRO	32-47-31N	115-33-44W
140	NONE	1050	KNOB	CA FRAZIER PARK	35-01-28N	118-55-05W
141	NONE	1530	KHPY	CA MORENO VALLEY	34-00-42N	117-11-03W
142	NONE	1570	KTGE	CA SALINAS	36-41-49N	121-37-22W
143	NONE	1460	KRRS	CA SANTA ROSA	38-22-13N	122-43-39W
144	1640	1470	KSIR	CO ESTES PARK	40-20-15N	105-31-36W
145	1610	1440	KRDZ	CO WRAY	40-04-56N	102-11-25W
146	NONE	1550	WLVX	CT BLOOMFIELD	41-51-47N	72-44-01W
147	NONE	1220	WXCT	CT HAMDEN	41-22-39N	72-55-44W
148	NONE	1500	WFIF	CT MILFORD	41-11-33N	73-06-05W
149	NONE	840	WRYM	CT NEW BRITAIN	41-41-15N	72-43-46W
150	NONE	990	WNTY	CT SOUTHINGTON	41-34-59N	72-53-01W
151	NONE	1120	WUST	DC WASHINGTON	38-55-04N	77-01-27W
152	NONE	930	WYUS	DE MILFORD	38-55-39N	75-29-20W
153	NONE	1290	WJBR	DE WILMINGTON	39-44-03N	75-31-44W
154	NONE	840	WPGS	FL CASSELBERRY	28-37-04N	81-13-31W
155	NONE	1580	WTCL	FL CHATTAHOOCHEE	30-40-14N	84-50-08W
156	NONE	1010	WXTL	FL JACKSONVILLE BEAC	30-18-36N	81-54-01W
157	NONE	730	WWTK	FL LAKE PLACID	27-24-25N	81-25-56W
158	NONE	1370	WOCA	FL OCALA	29-12-04N	82-09-07W
159	NONE	900	WMOP	FL OCALA	29-14-17N	82-07-17W
160	NONE	1480	WVCF	FL OCOEE	28-33-27N	81-32-29W
161	NONE	1570	WOKC	FL OKEECHOBEE	27-12-59N	80-49-53W
162	NONE	1420	WAOC	FL ST. AUGUSTINE	29-51-00N	81-19-45W
163	NONE	1410	WHBT	FL TALLAHASSEE	30-29-35N	84-17-00W
164	NONE	1110	WTIS	FL TAMPA	27-52-26N	82-37-53W
165	NONE	1550	WAMA	FL TAMPA	27-55-16N	82-23-41W

Rank	IF	Allot	Freq.	Call	Location	Coordinates	
166		NONE	1600	WAOS	GA AUSTELL	33-48-34N	84-39-25W
167		NONE	990	WHIA	GA DAWSON	31-48-35N	84-27-45W
168		NONE	1520	WKVQ	GA EATONTON	33-19-19N	83-25-03W
169		NONE	1130	WLBA	GA GAINESVILLE	34-16-45N	83-46-33W
170		NONE	1600	WNGA	GA NASHVILLE	31-12-07N	83-13-18W
171		NONE	980	WLMX	GA ROSSVILLE	34-58-03N	85-18-00W
172		NONE	1310	WBRO	GA WAYNESBORO	33-06-14N	81-59-11W
173		NONE	1580	KFQC	IA DAVENPORT	41-34-15N	90-34-53W
174		NONE	1580	WKKD	IL AURORA	41-46-12N	88-16-03W
175		NONE	790	WRMS	IL BEARDSTOWN	40-00-13N	90-23-49W
176		NONE	1460	WIXN	IL DIXON	41-49-38N	89-29-11W
177		NONE	1330	WKTA	IL EVANSTON	42-08-23N	87-53-09W
178		NONE	1520	WLUV	IL LOVES PARK	42-19-48N	89-04-58W
179		NONE	1140	WVEL	IL PEKIN	40-36-08N	89-37-32W
180		NONE	1020	WPEO	IL PEORIA	40-41-53N	89-31-31W
181		NONE	1560	WSHY	IL SHELBYVILLE	39-24-05N	88-49-00W
182		NONE	1030	WNVR	IL VERNON HILLS	42-12-40N	87-57-41W
183		NONE	1220	WKRS	IL WAUKEGAN	42-20-59N	87-52-53W
184		NONE	1500	WBRI	IN INDIANAPOLIS	39-52-14N	86-05-17W
185		NONE	1560	WSEZ	IN PAOLI	38-32-25N	86-28-42W
186		NONE	1560	WRIN	IN RENSSELAER	40-57-41N	87-09-07W
187		NONE	1350	KMAN	KS MANHATTAN	39-13-00N	96-33-30W
188		NONE	1130	WKED	KY FRANKFORT	38-12-13N	84-54-51W
189		NONE	1170	WDFB	KY JUNCTION CITY	37-35-46N	84-50-19W
190		NONE	680	WLSY	KY NEWBURG	38-05-31N	85-40-56W
191		1640	600	WVOG	LA NEW ORLEANS	29-57-25N	90-09-33W
192		1660	1510	KAGY	LA PORT SULPHUR	29-29-03N	89-42-15W
193		1650	1270	KVCL	LA WINNFIELD	31-56-58N	92-37-37W
194		NONE	950	WROL	MA BOSTON	42-26-15N	70-59-40W
195		NONE	830	WCRN	MA CHERRY VALLEY	42-14-47N	71-55-51W
196		NONE	730	WACE	MA CHICOPEE	42-10-02N	72-37-31W
197		NONE	800	WCCM	MA LAWRENCE	42-40-26N	71-11-26W
198		NONE	1110	WUHN	MA PITTSFIELD	42-26-22N	73-17-30W
199		NONE	810	WYRE	MD ANNAPOLIS	38-58-13N	76-30-28W
200		NONE	1190	WANN	MD ANNAPOLIS	38-56-33N	76-28-53W
201		NONE	1010	WYST	MD BALTIMORE	39-16-38N	76-37-59W
202		NONE	1520	WHRF	MD BEL AIR	39-34-18N	76-26-57W
203		NONE	1320	WICO	MD SALISBURY	38-21-39N	75-37-00W
204		1620	790	WRUM	ME RUMFORD	44-30-53N	70-31-01W
205		NONE	1060	WHFB	MI BENTON HARBOR-ST.	42-04-44N	86-28-00W
206		NONE	1180	WXLA	MI DIMONDALE	42-39-01N	84-34-49W
207		NONE	730	WVIC	MI EAST LANSING	42-38-45N	84-33-39W
208		NONE	1350	WHMI	MI HOWELL	42-36-09N	83-59-18W
209		NONE	1510	WJCO	MI JACKSON	42-11-10N	84-22-39W
210		1620	1090	KJJK	MN FERGUS FALLS	46-14-43N	95-58-46W
211		1690	1460	KDWA	MN HASTINGS	44-42-49N	92-50-30W
212		NONE	770	KUOM	MN MINNEAPOLIS	44-42-52N	93-03-39W
213		1640	1080	KYMN	MN NORTHFIELD	44-29-12N	93-06-20W
214		NONE	1520	KOLM	MN ROCHESTER	43-59-13N	92-25-05W
215		NONE	1420	KZMO	MO CALIFORNIA	38-38-12N	92-35-00W
216		NONE	1580	KTGR	MO COLUMBIA	38-58-01N	92-18-39W
217		NONE	1140	KLTK	MO SOUTHWEST CITY	36-30-28N	94-36-35W
218		NONE	1470	WVBS	NC BURGAW	34-32-05N	77-54-31W
219		NONE	1180	WMYT	NC CAROLINA BEACH	34-09-03N	78-04-48W
220		NONE	1460	WNBR	NC FUQUAY-VARINA	35-36-37N	78-48-14W
221		NONE	1300	WFXN	NC GOLDSBORO	35-24-08N	78-01-20W
222		NONE	570	WLLE	NC RALEIGH	35-45-37N	78-39-27W
223		1650	1330	KDRQ	ND WISHEK	46-15-02N	99-30-17W
224		NONE	1600	KNCY	NE NEBRASKA CITY	40-40-27N	95-53-08W
225		1630	1600	KRFS	NE SUPERIOR	40-01-30N	98-04-38W

Rank	IF	Allot	Freq.	Call	Location	Coordinates	
226		NONE	1410	WHTG	NJ EATONTOWN	40-16-10N	74-04-19W
227		NONE	1000	WRNJ	NJ HACKETTSTOWN	40-50-47N	74-48-16W
228		NONE	1440	WREY	NJ MILLVILLE	39-25-19N	75-01-14W
229		NONE	1360	WNNJ	NJ NEWTON	41-02-22N	74-44-19W
230		NONE	1520	WIBG	NJ OCEAN CITY - SOME	39-19-05N	74-37-09W
231		NONE	1550	WNJO	NJ TOMS RIVER	39-59-15N	74-16-07W
232		1700	1580	KZKL	NM ALBUQUERQUE	35-10-14N	106-37-51W
233		NONE	1000	KKIM	NM ALBUQUERQUE	35-10-14N	106-37-51W
234		NONE	1080	WUFO	NY AMHERST	42-56-46N	78-49-43W
235		NONE	1120	WHTT	NY BUFFALO	42-49-50N	78-47-54W
236		NONE	1190	WSCM	NY COBLESKILL	42-41-26N	74-26-40W
237		NONE	1170	WARW	NY CORNWALL	41-26-24N	74-04-25W
238		NONE	1100	WHLI	NY HEMPSTEAD	40-41-06N	73-36-38W
239		NONE	1000	WLNL	NY HORSEHEADS	42-09-14N	76-50-47W
240		1610	1050	WYBG	NY MASSENA	44-53-42N	74-56-05W
241		NONE	1520	WTHE	NY MINEOLA	40-44-45N	73-37-29W
242		NONE	1220	WGNY	NY NEWBURGH	41-32-07N	74-06-41W
243		NONE	730	WDOS	NY ONEONTA	42-27-29N	75-00-20W
244		NONE	1410	WSTL	NY SOUTH GLENS FALLS	43-16-07N	73-40-14W
245		NONE	1330	WHAZ	NY TROY	42-46-35N	73-41-10W
246		NONE	970	WATH	OH ATHENS	39-20-40N	82-06-21W
247		NONE	1290	WOMP	OH BELLAIRE	40-02-09N	80-46-16W
248		NONE	1520	WINW	OH CANTON	40-50-41N	81-21-02W
249		NONE	820	WOSU	OH COLUMBUS	40-01-44N	83-03-22W
250		NONE	1300	WMVO	OH MOUNT VERNON	40-24-17N	82-26-23W
251		NONE	1510	WVAC	OH NORWALK	41-16-45N	82-39-23W
252		NONE	1000	WCCD	OH PARMA	41-19-11N	81-46-07W
253		NONE	1330	WELW	OH WILLOUGHBY	41-38-56N	81-25-19W
254		NONE	750	KSEO	OK DURANT	34-00-07N	96-25-19W
255		NONE	1570	KMYZ	OK PRYOR	36-18-04N	95-19-29W
256		1670	630	KWRO	OR COQUILLE	43-10-17N	124-11-54W
257		NONE	1600	WAYC	PA BEDFORD	40-00-45N	78-29-54W
258		NONE	970	WBLF	PA BELLEFONTE	40-54-12N	77-46-06W
259		NONE	1590	WPLW	PA CARNEGIE	40-25-40N	80-05-09W
260		NONE	940	WESA	PA CHARLEROI	40-07-24N	79-53-45W
261		NONE	1010	WTGC	PA LEWISBURG	40-56-40N	76-52-45W
262		NONE	1540	WPGR	PA PHILADELPHIA	40-02-46N	75-14-15W
263		NONE	1080	WEEP	PA PITTSBURGH	40-36-17N	79-57-37W
264		NONE	860	WYJZ	PA PITTSBURGH	40-29-27N	79-58-55W
265		NONE	730	WPIT	PA PITTSBURGH	40-29-02N	79-59-34W
266		NONE	1540	WECZ	PA PUNXSUTAWNEY	40-57-36N	79-00-08W
267		NONE	630	WEJL	PA SCRANTON	41-24-35N	75-40-01W
268		NONE	1380	WAYZ	PA WAYNESBORO	39-44-20N	77-36-10W
269		NONE	1220	WRIB	RI PROVIDENCE	41-49-15N	71-23-07W
270		NONE	960	WBEU	SC BEAUFORT	32-26-18N	80-42-38W
271		NONE	1410	WPCC	SC CLINTON	34-26-42N	81-53-24W
272		NONE	1370	WMNY	SC ELLOREE-SANTEE	33-30-07N	80-32-14W
273		NONE	1500	WEAC	SC GAFFNEY	35-05-18N	81-38-40W
274		NONE	950	WMCJ	SC MONCKS CORNER	33-12-18N	80-03-11W
275		NONE	1520	WKZQ	SC MYRTLE BEACH	33-42-20N	78-53-23W
276		NONE	1380	WGUS	SC NORTH AUGUSTA	33-29-17N	81-56-46W
277		NONE	1600	WKZK	SC NORTH AUGUSTA	33-29-37N	81-59-52W
278		1700	1570	KOSZ	SD VERMILLION	42-47-32N	97-00-03W
279		NONE	1200	WQDQ	TN LEBANON	36-11-42N	86-17-26W
280		NONE	1040	WQBB	TN POWELL	36-02-34N	84-02-51W
281		NONE	1090	KACO	TX BELLVILLE	29-56-50N	96-15-54W
282		NONE	1280	KTTX	TX BRENHAM	30-10-05N	96-25-20W
283		NONE	1120	KCLE	TX CLEBURNE	32-23-05N	97-23-46W
284		NONE	650	KIKK	TX PASADENA	29-41-18N	95-10-29W
285		NONE	980	KMPQ	TX ROSENBERG-RICHMON	29-33-10N	95-47-00W

Rank	IF	Allot	Freq.	Call	Location	Coordinates
286		NONE	1410	KBAL	TX SAN SABA	31-11-26N 98-42-55W
287		NONE	1390	KBEC	TX WAXAHACHIE	32-25-30N 96-51-56W
288		NONE	1220	KZEE	TX WEATHERFORD	32-47-09N 97-47-55W
289		NONE	1420	WAMV	VA AMHERST	37-32-23N 79-05-30W
290		NONE	780	WABS	VA ARLINGTON	38-53-44N 77-08-04W
291		NONE	1170	WVZN	VA LYNCHBURG	37-27-50N 79-07-23W
292		NONE	1590	WFTH	VA RICHMOND	37-30-02N 77-27-28W
293		NONE	1540	WRBN	VA RICHMOND	37-37-08N 77-25-27W
294		NONE	1550	WKBA	VA VINTON	37-17-24N 79-55-22W
295		1610	1280	KUDY	WA SPOKANE	47-36-27N 117-21-40W
296		NONE	1560	KZIZ	WA SUMNER	47-12-48N 122-13-25W
297		NONE	1530	WMBE	WI CHILTON	44-01-10N 88-09-32W
298		NONE	1550	WHIT	WI MADISON	43-00-08N 89-23-08W
299		NONE	1590	WCAE	WI NEKOOSA	44-16-05N 89-57-35W
300		NONE	740	WRNR	WV MARTINSBURG	39-28-25N 77-55-57W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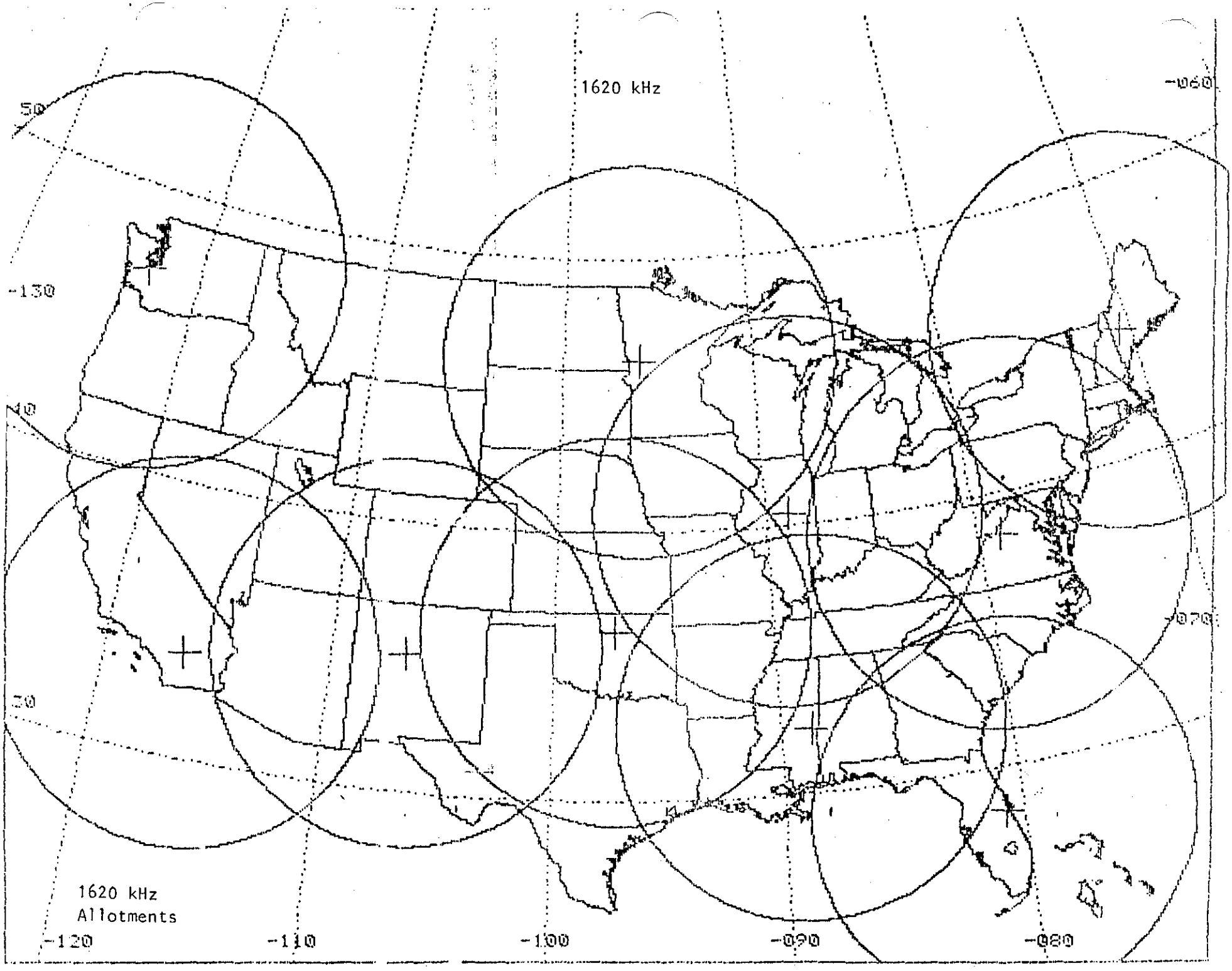
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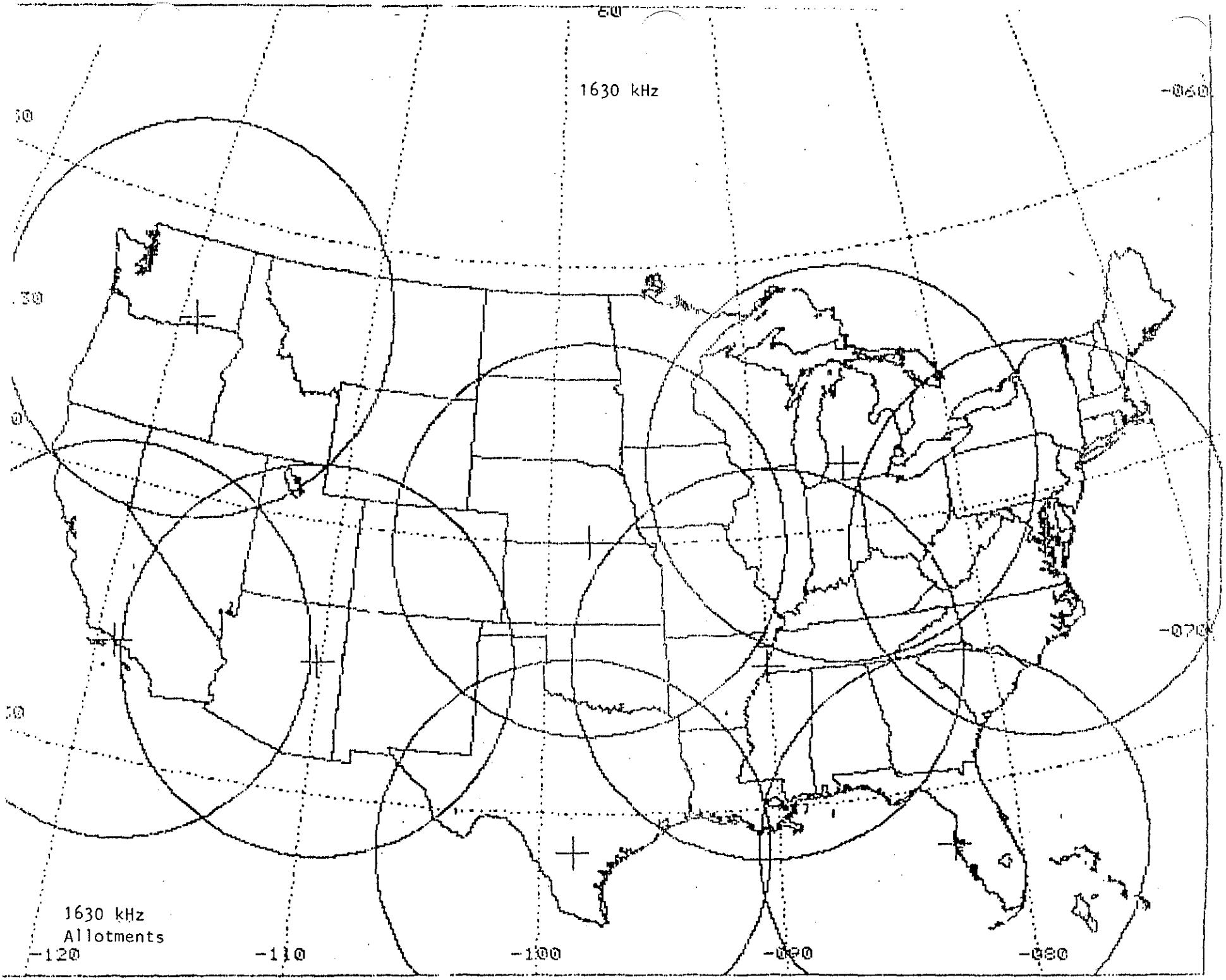
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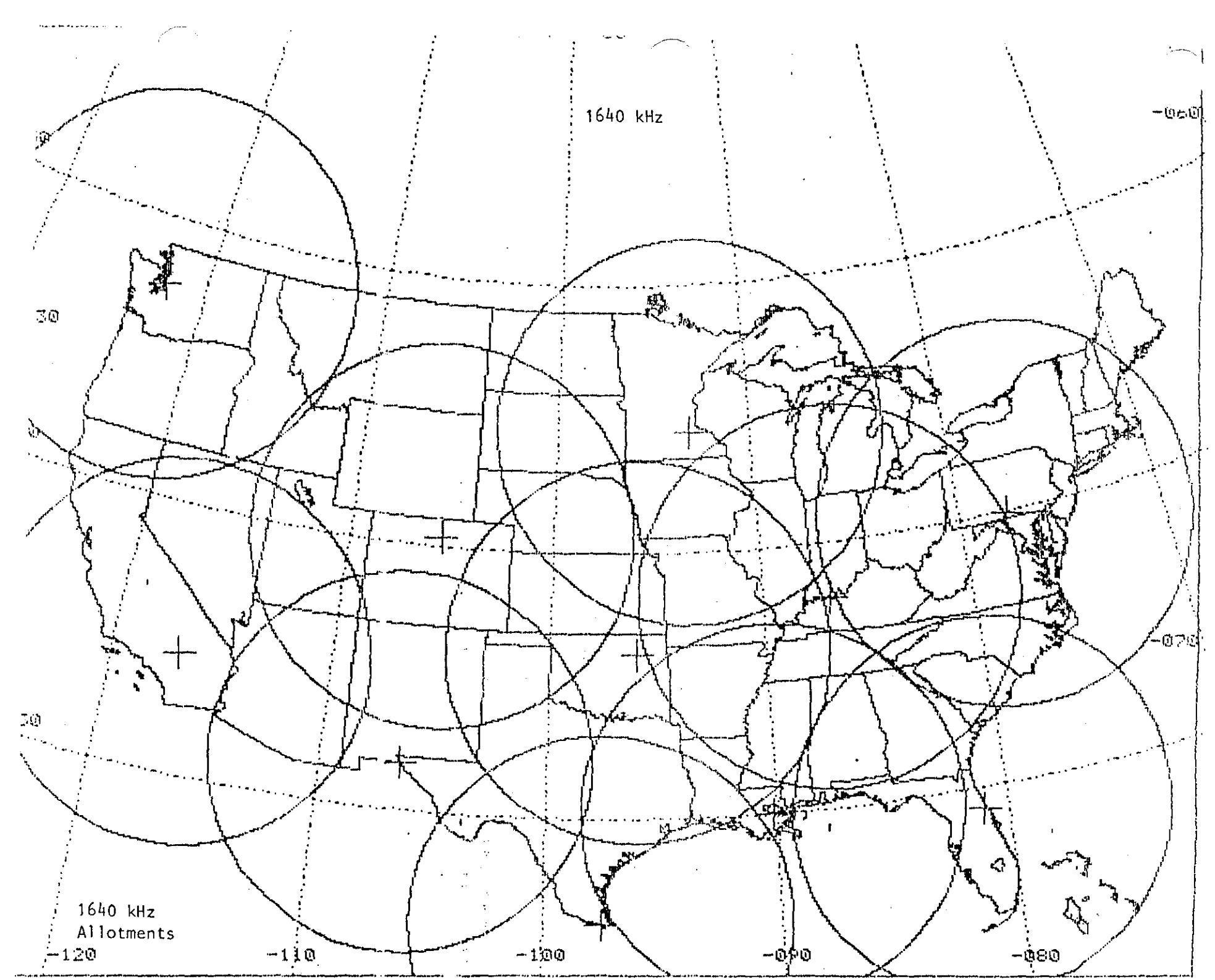
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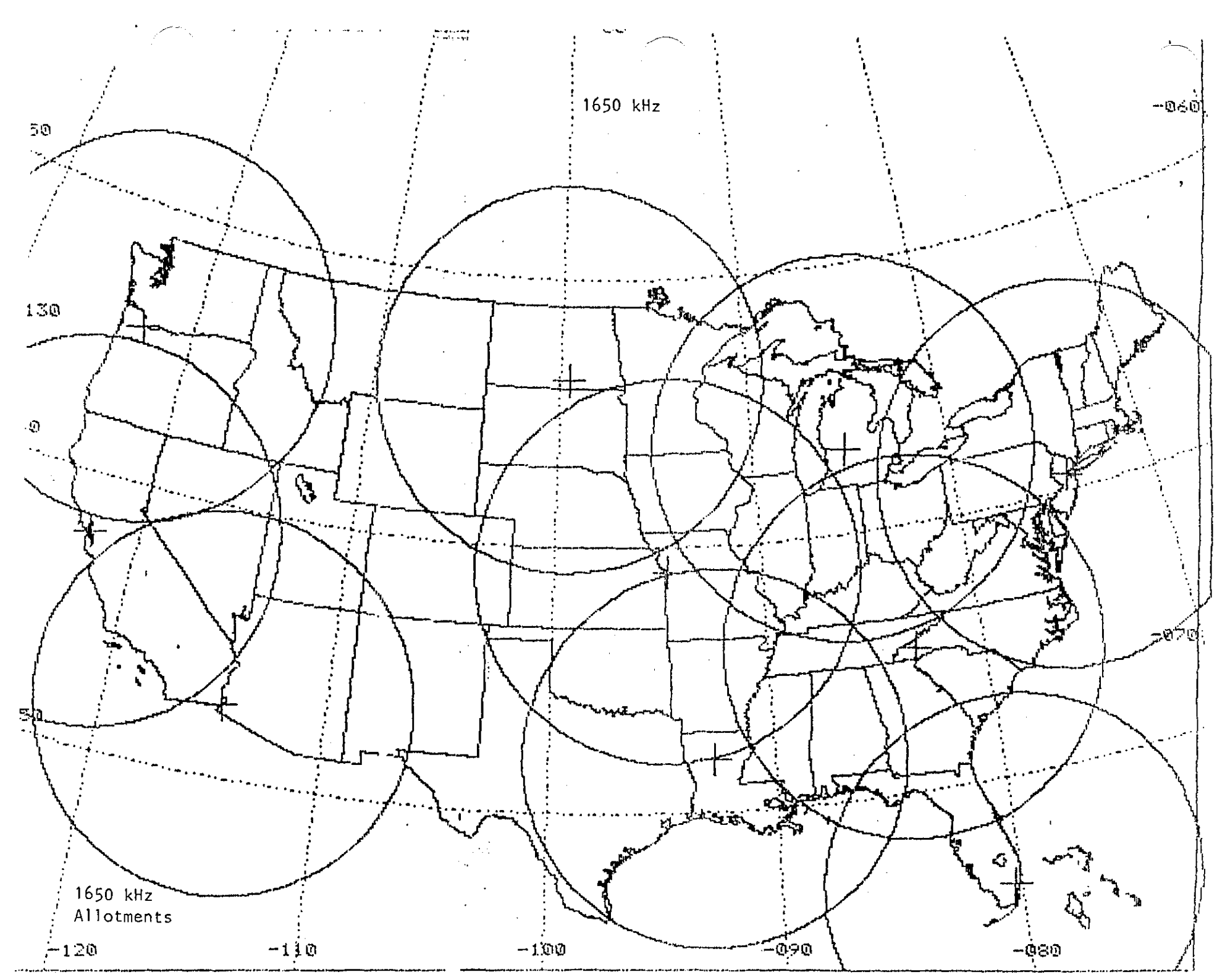
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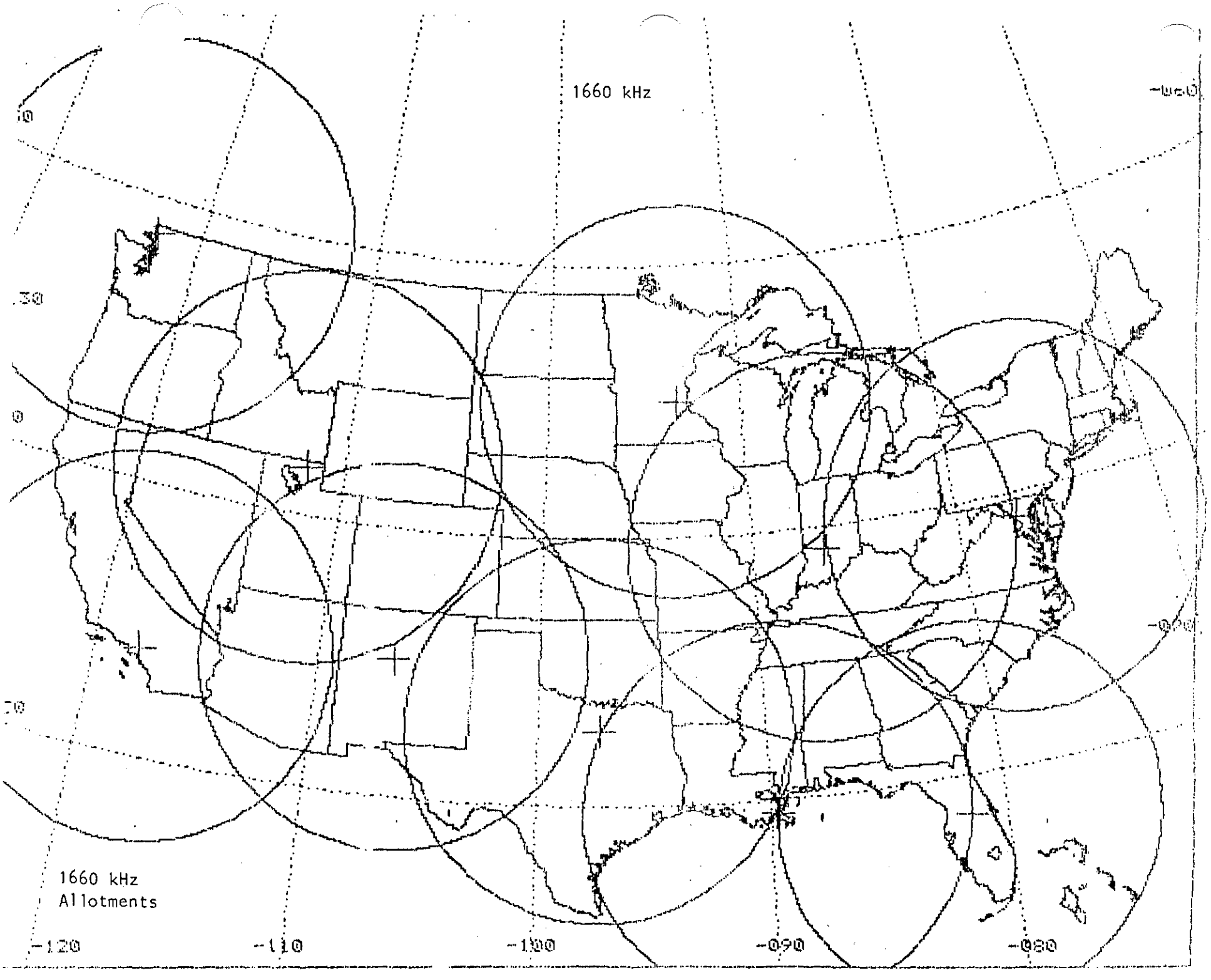
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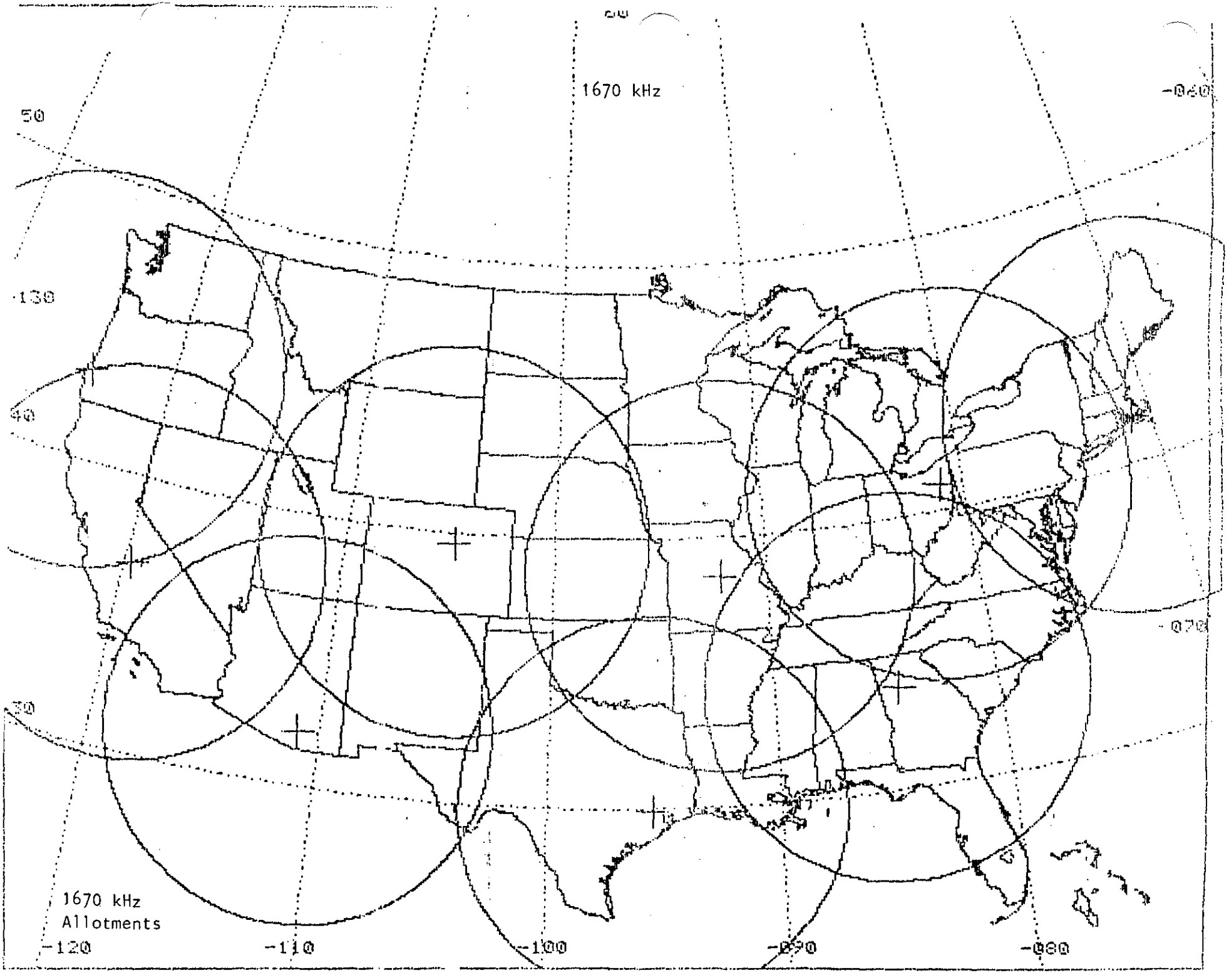
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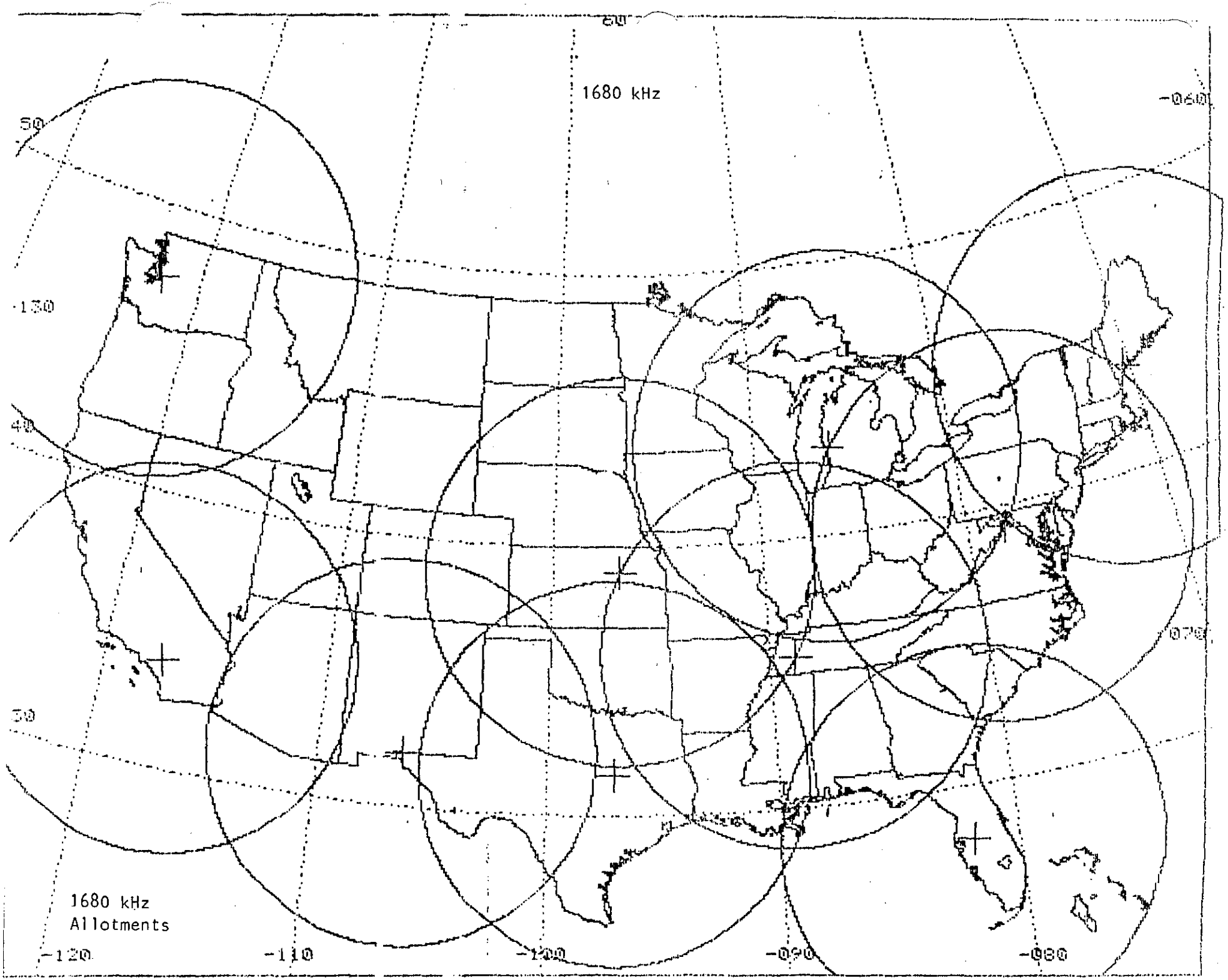
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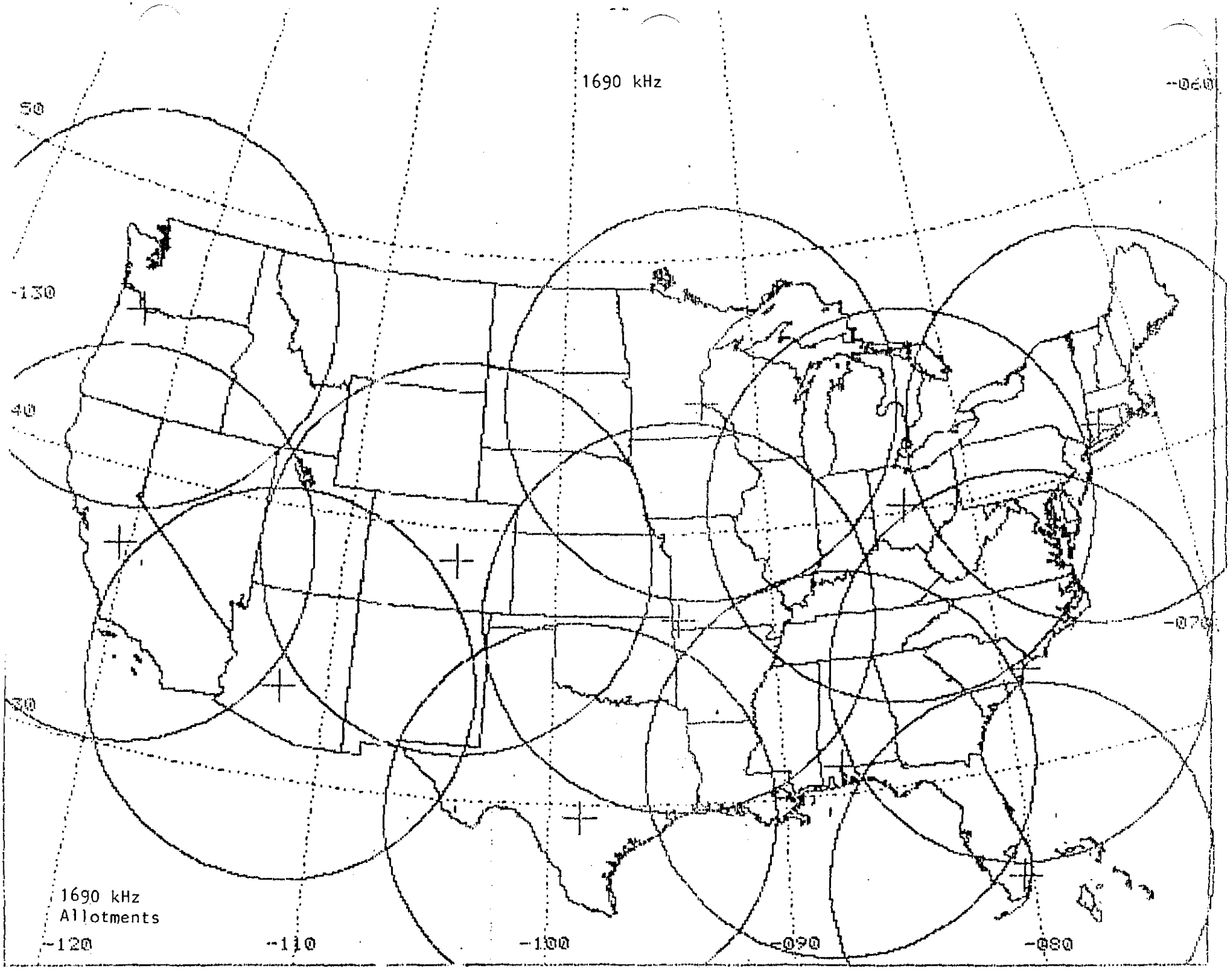
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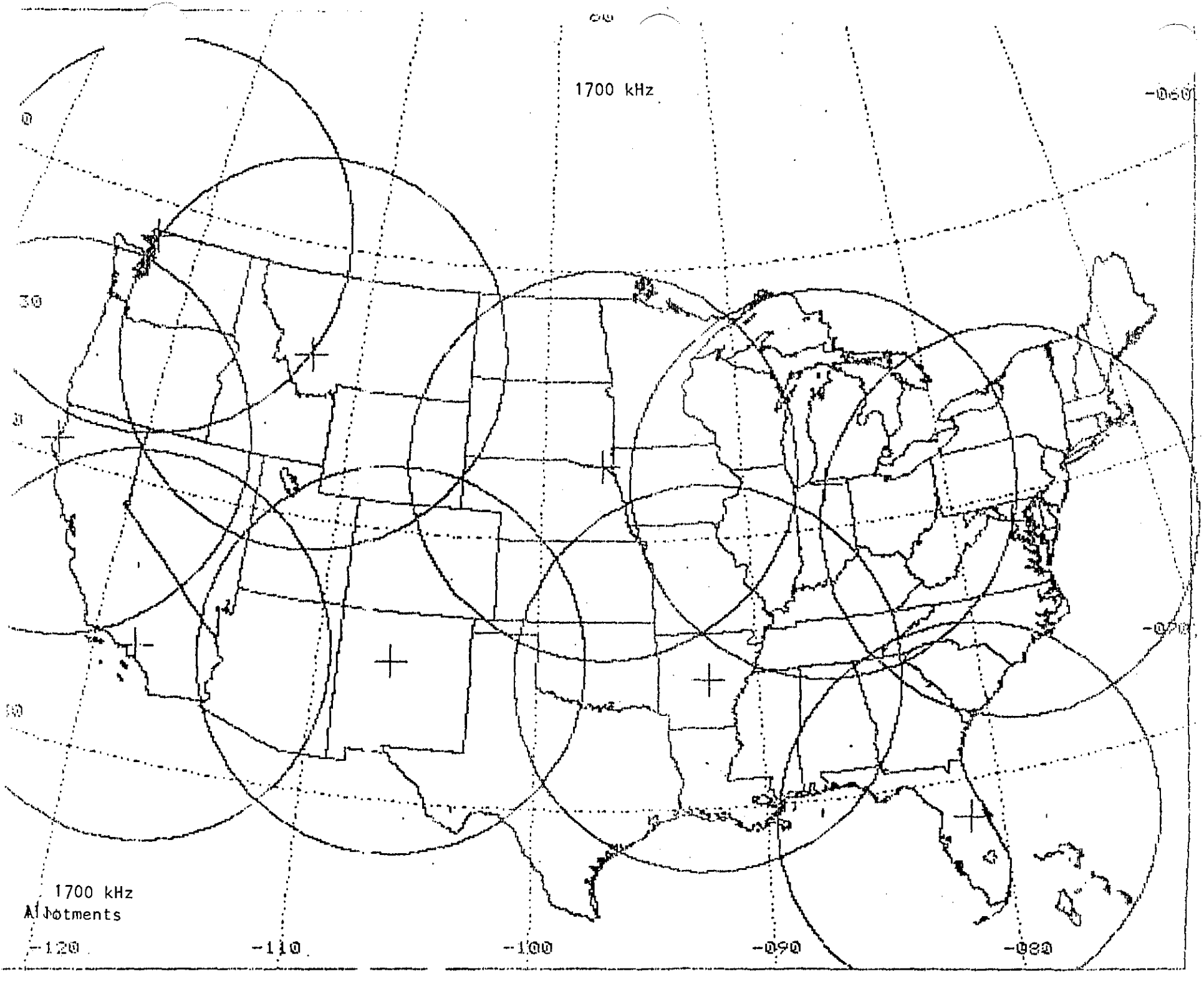
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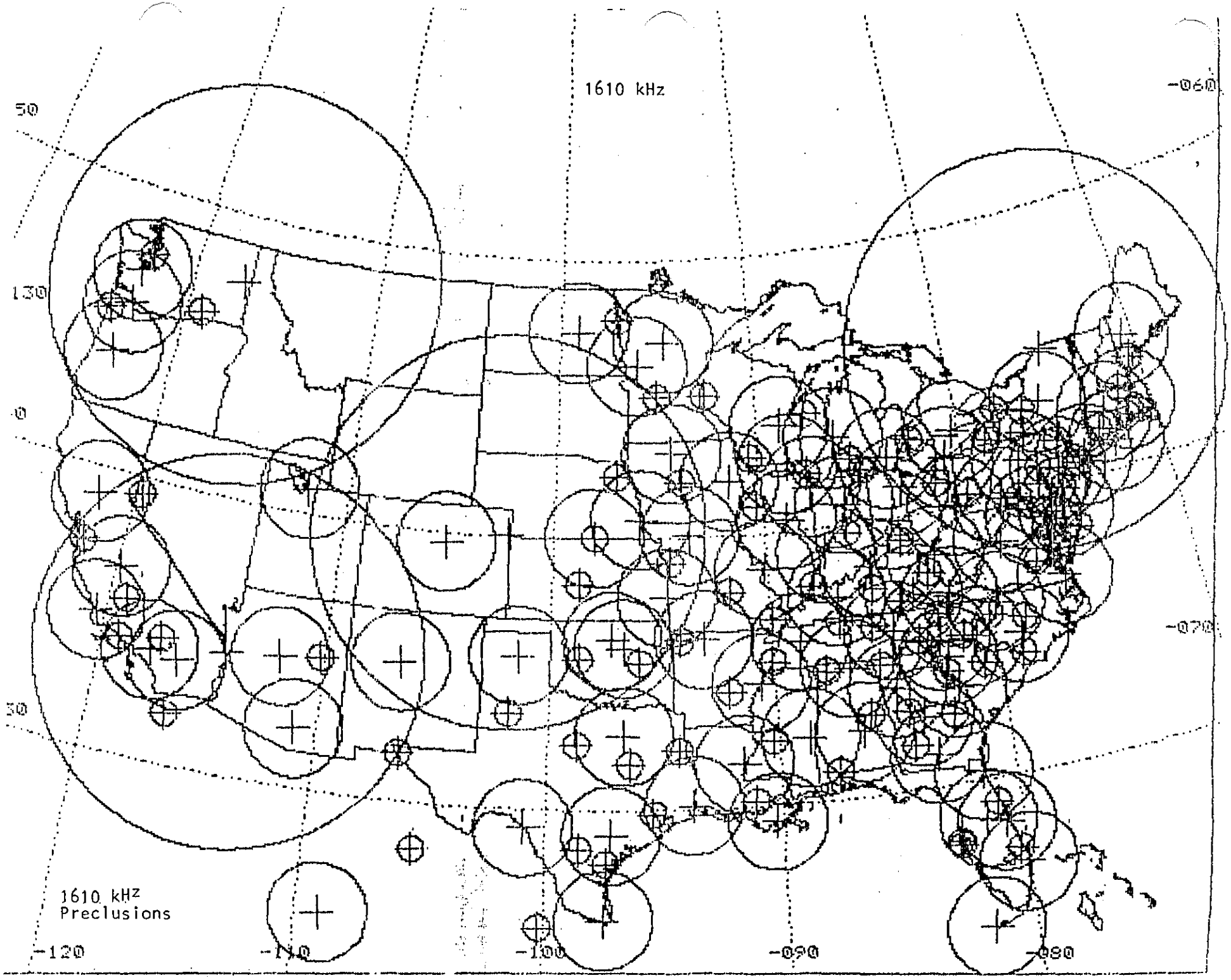
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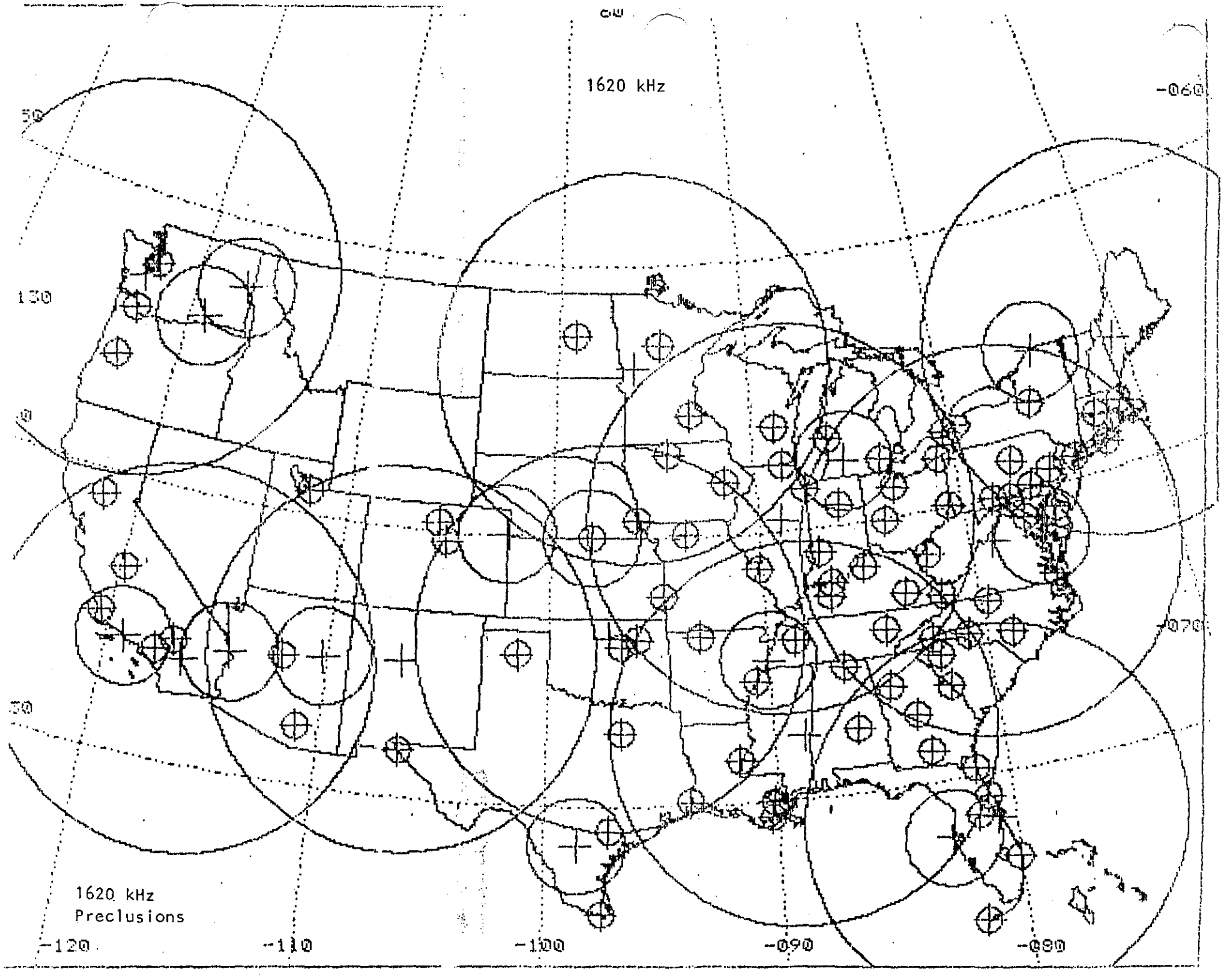
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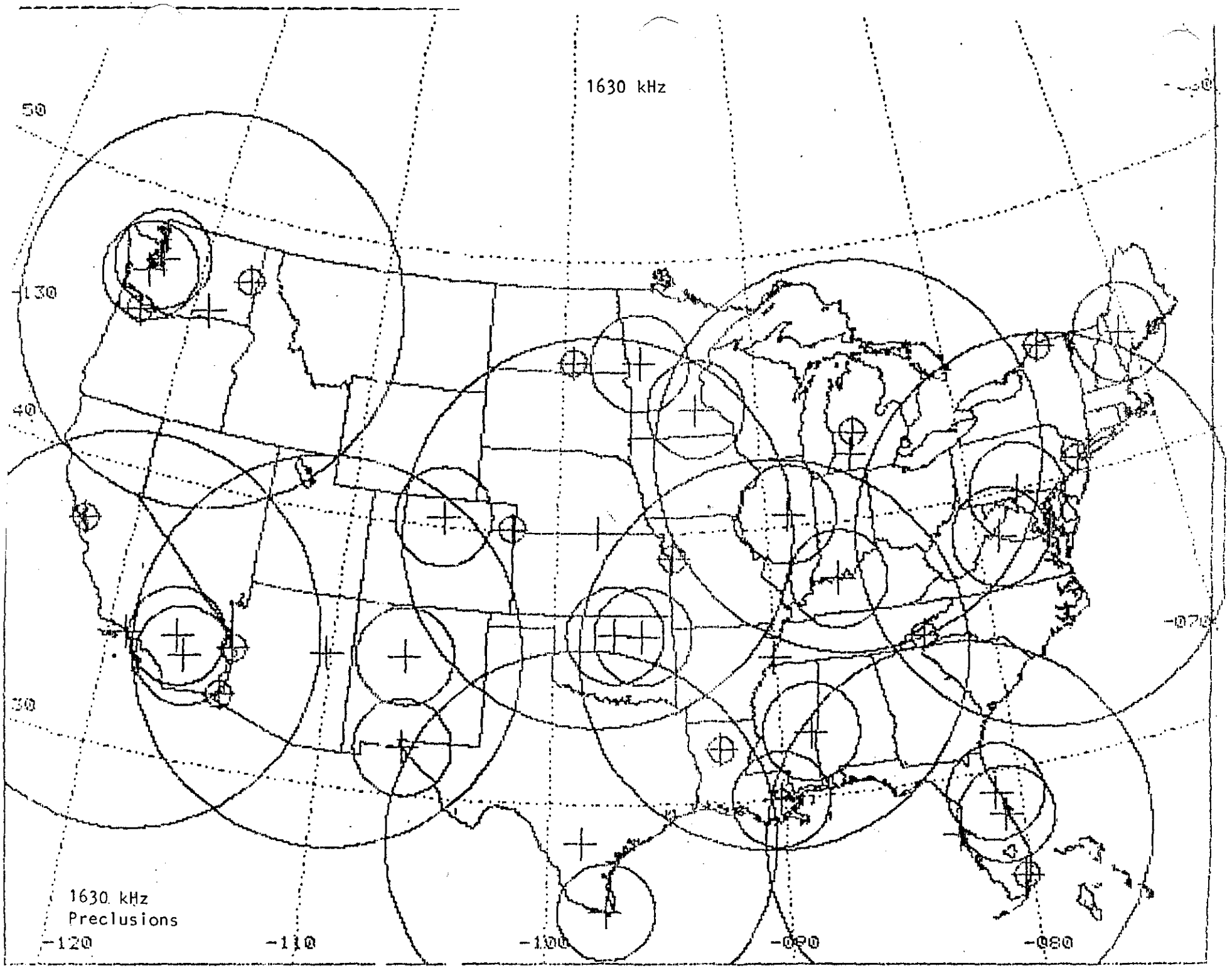
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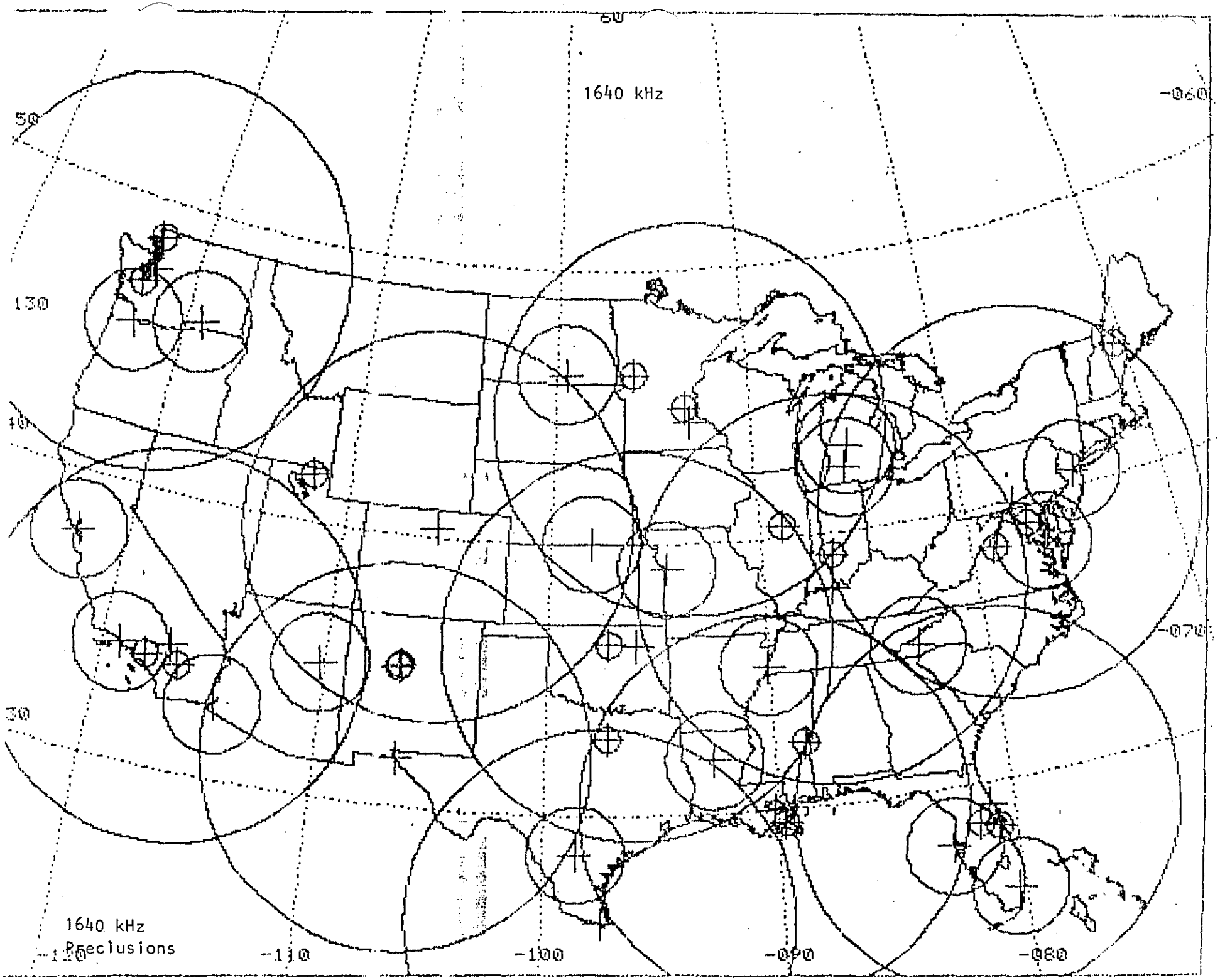
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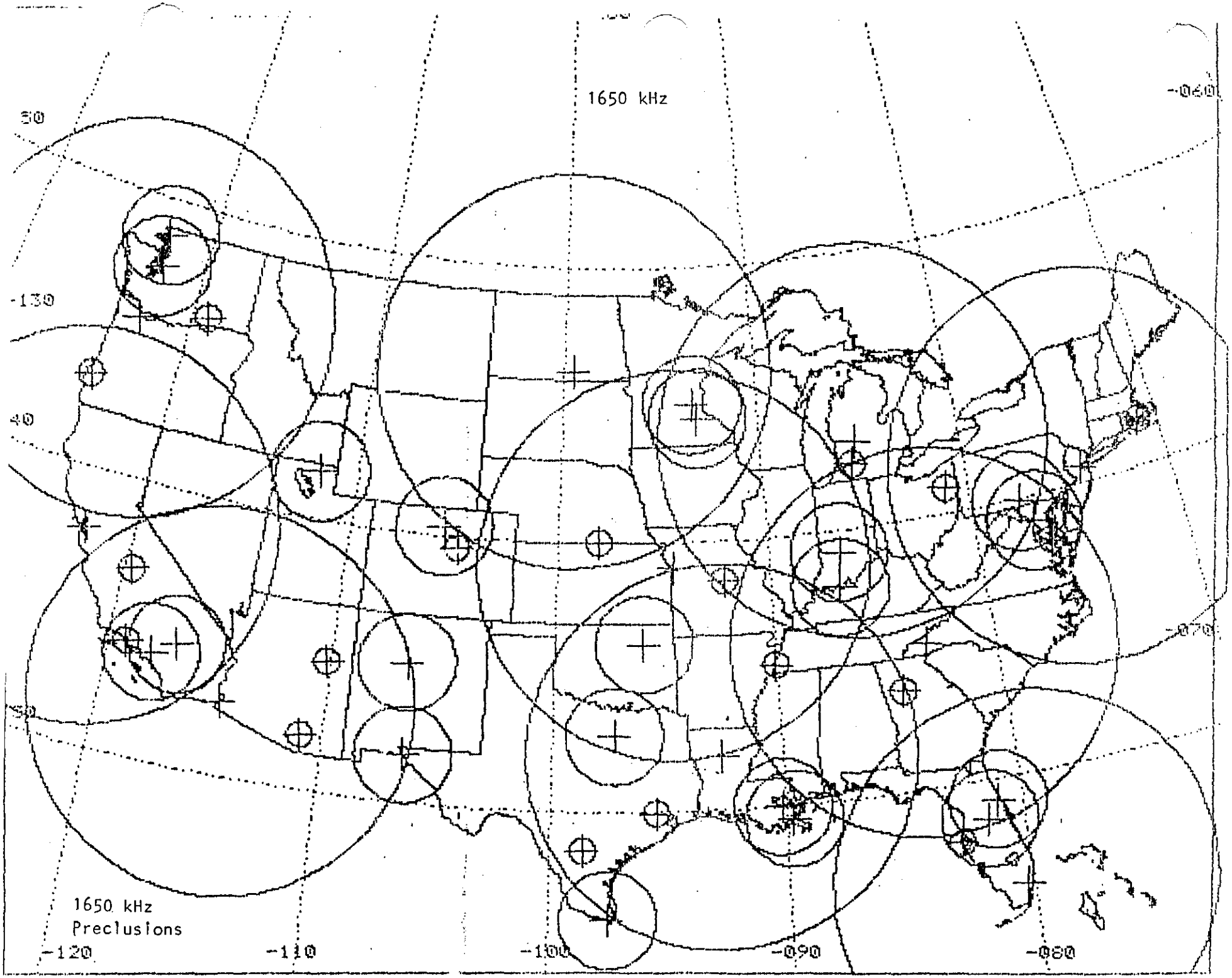
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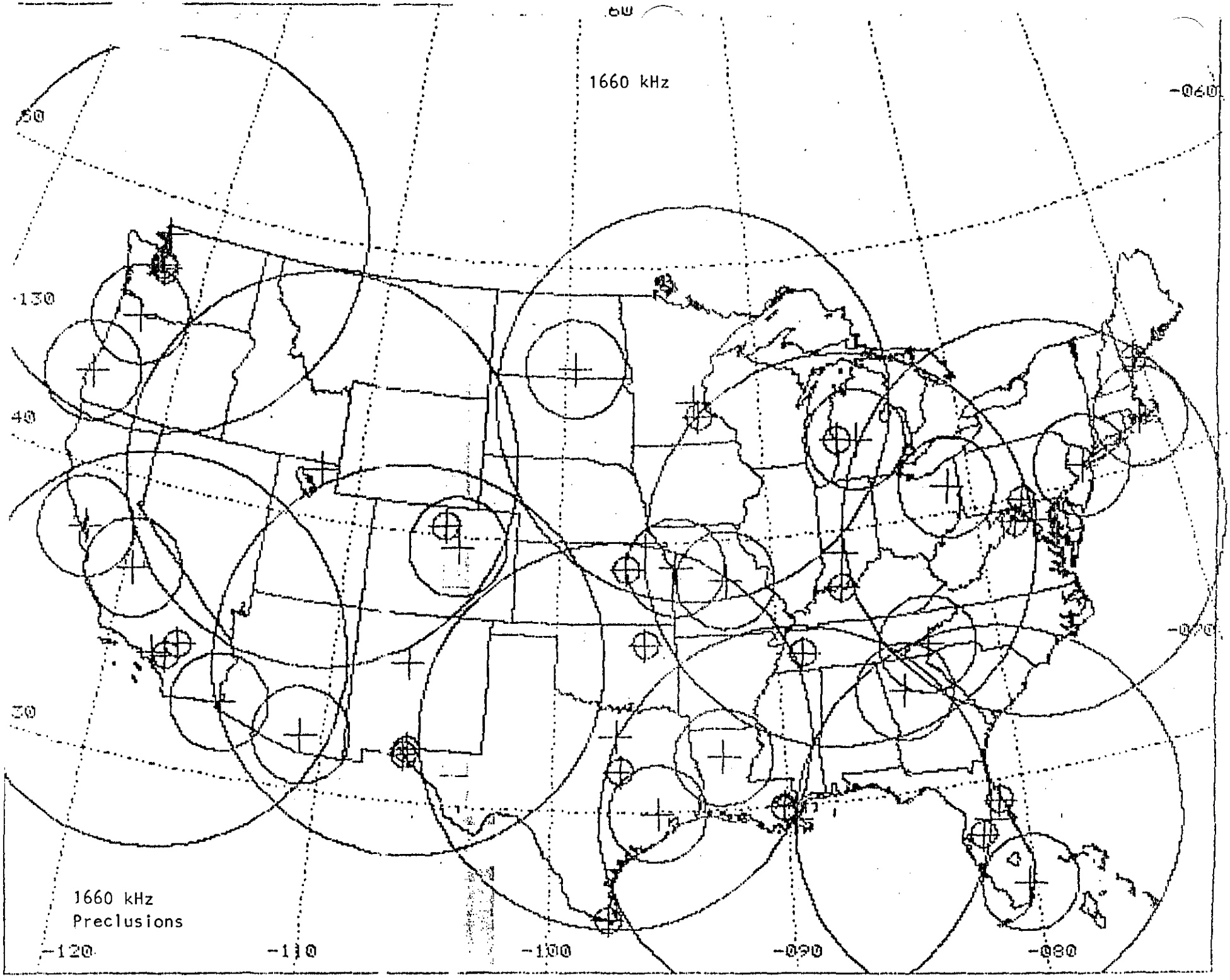
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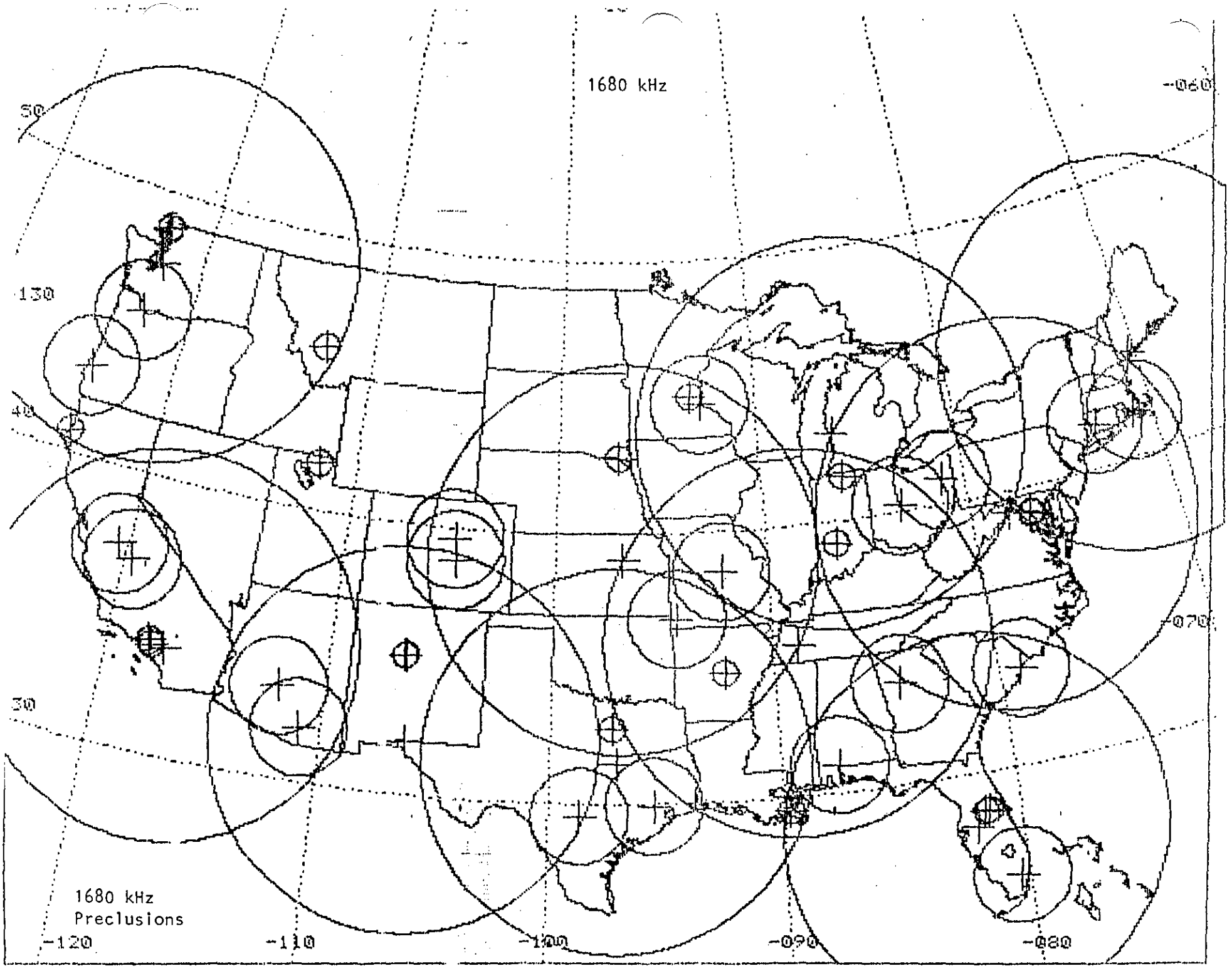
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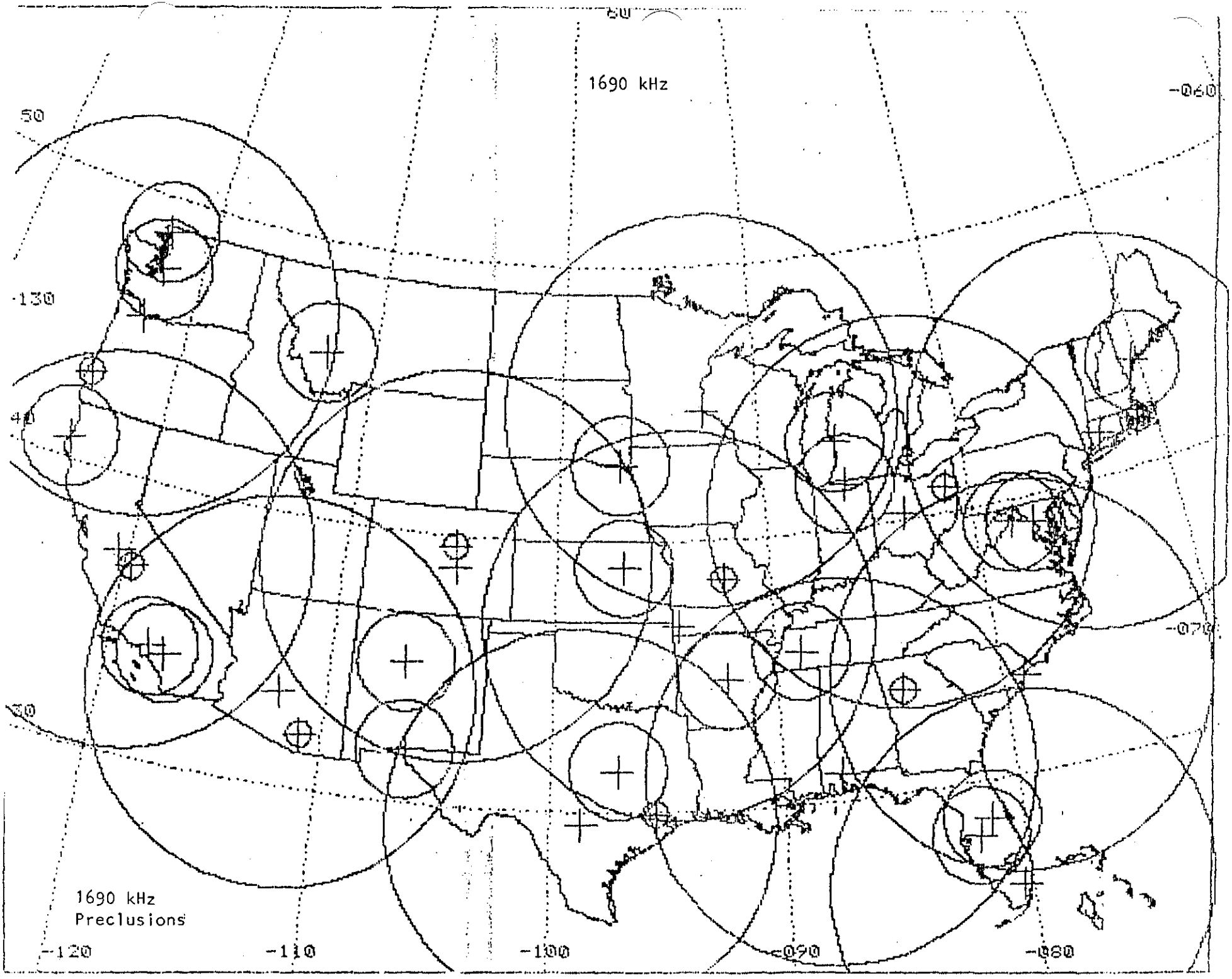
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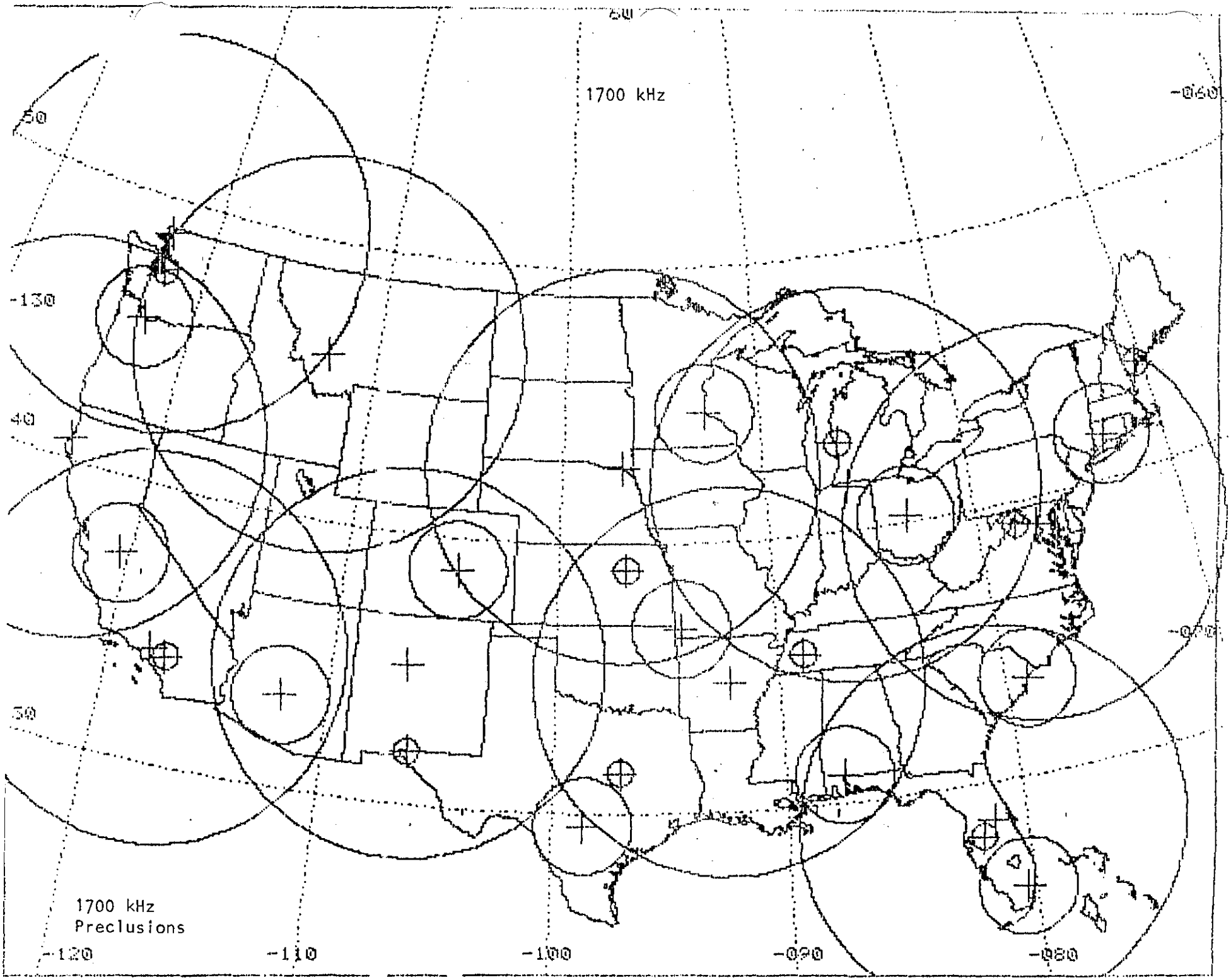
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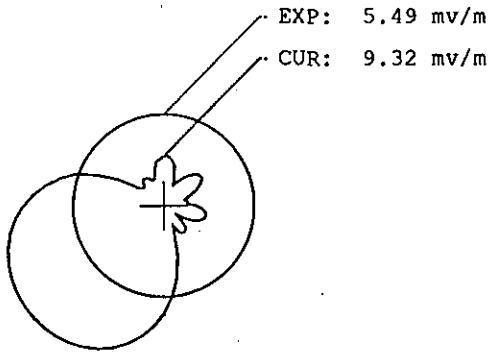


-089

-088

32

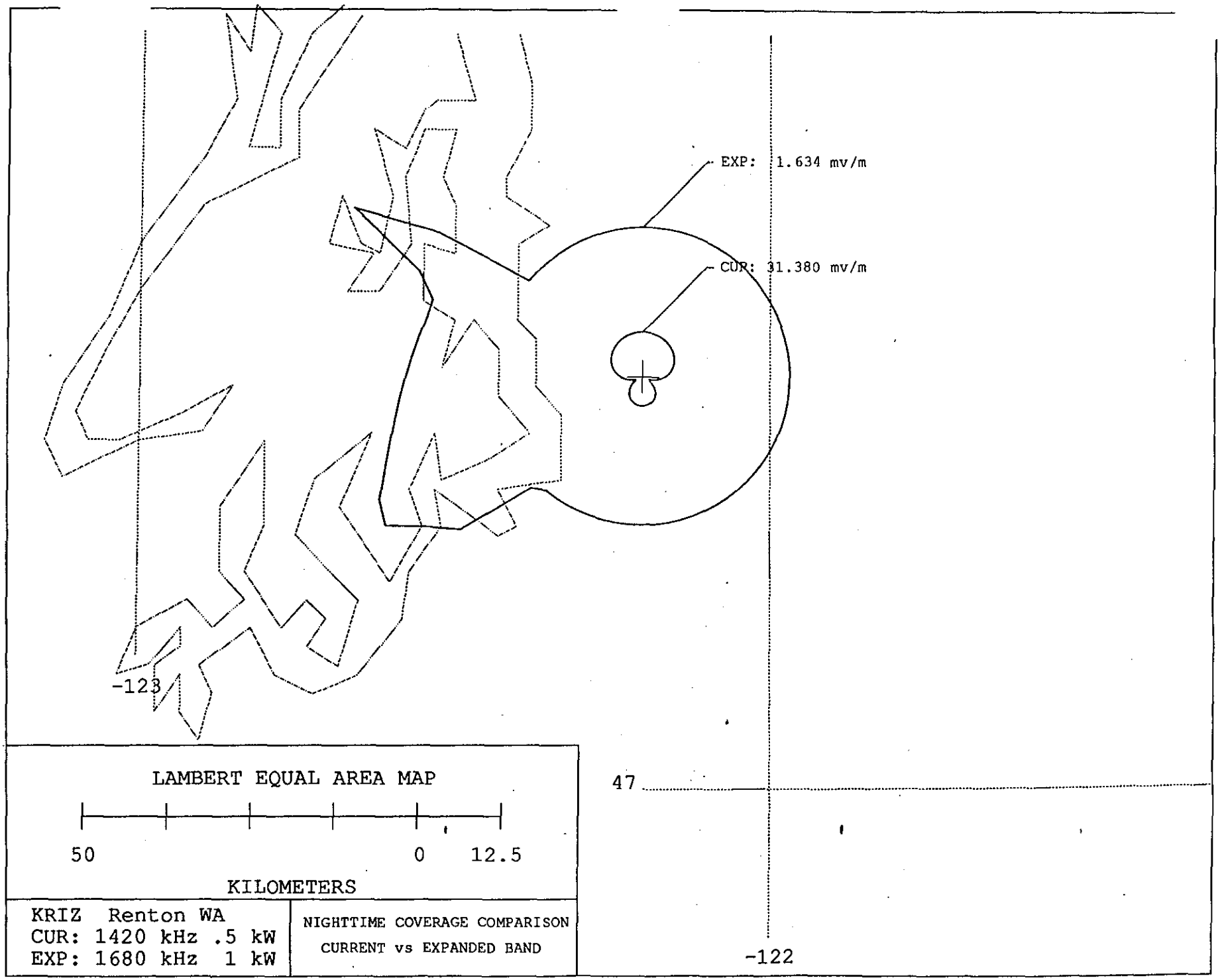
LAMBERT EQUAL AREA MAP

50 0 12.5

KILOMETERS

WMOX Meridian MS
CUR: 1010 kHz 1 kW
EXP: 1620 kHz 1 kW

NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND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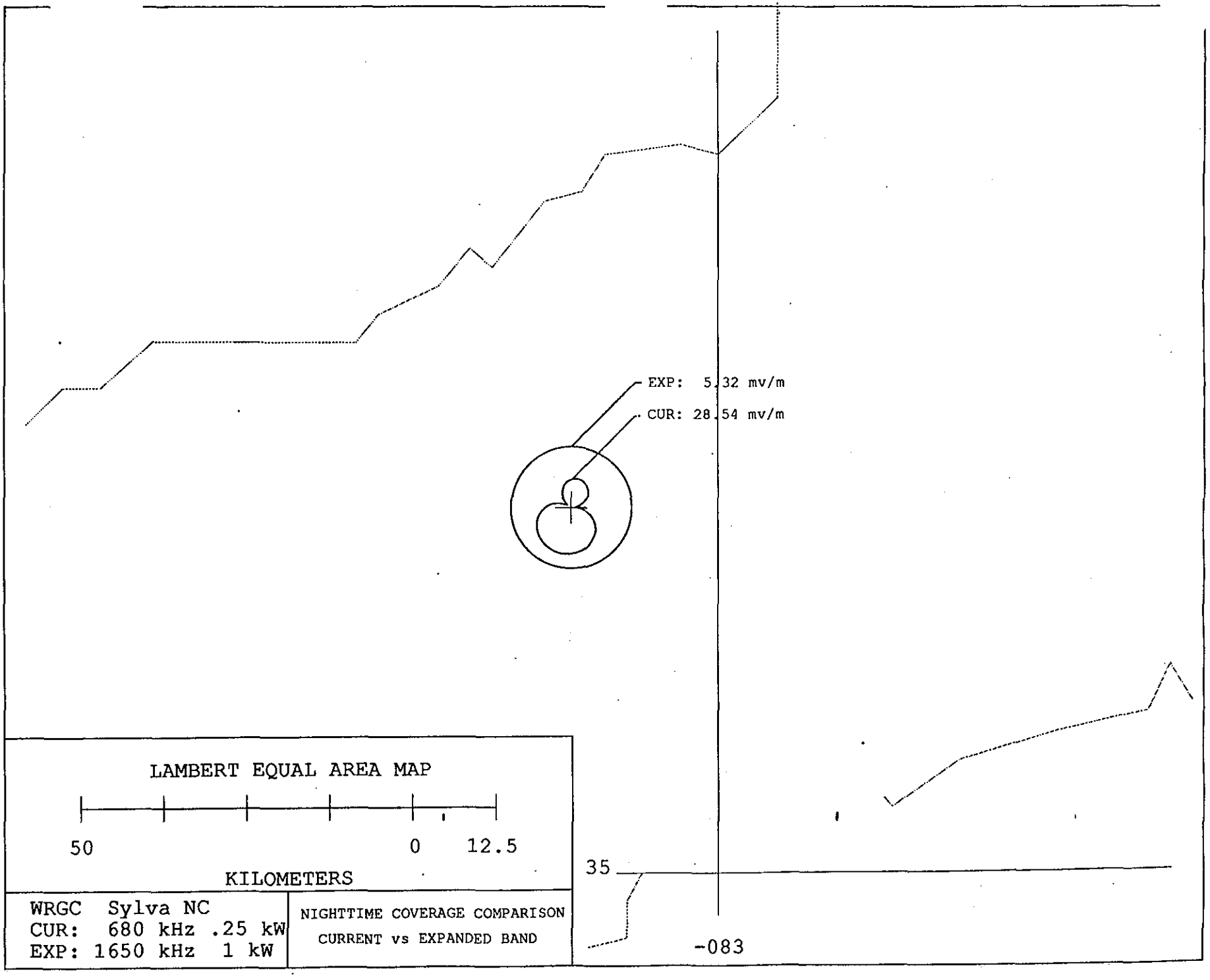
CUR: 31.380 mv/m
-123
47
-122
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
KRIZ Renton WA
CUR: 1420 kHz .5 kW
EXP: 1680 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND


EXP: 5.32 mv/m
CUR: 28.54 mv/m
LAMBERT EQUAL AREA MAP
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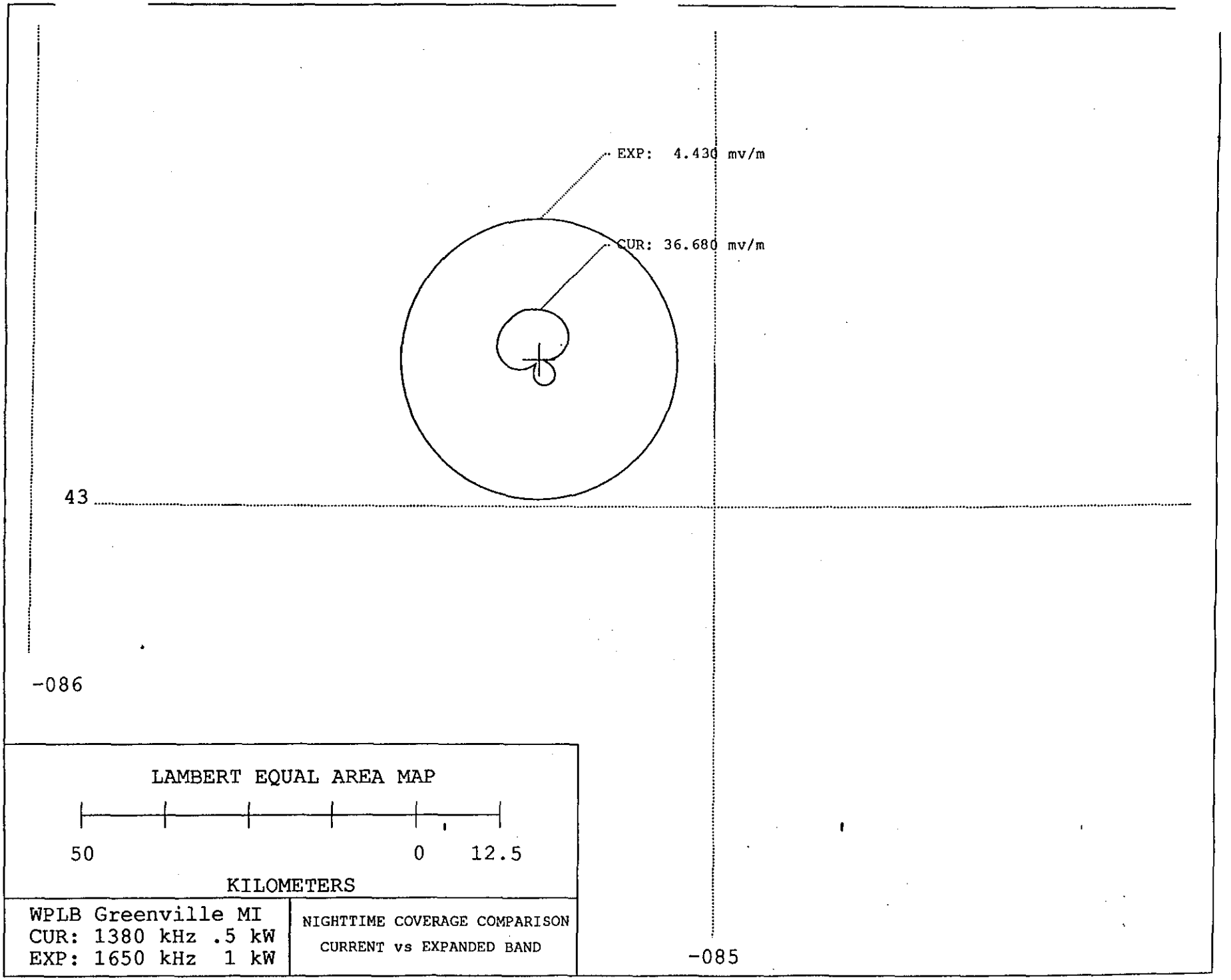
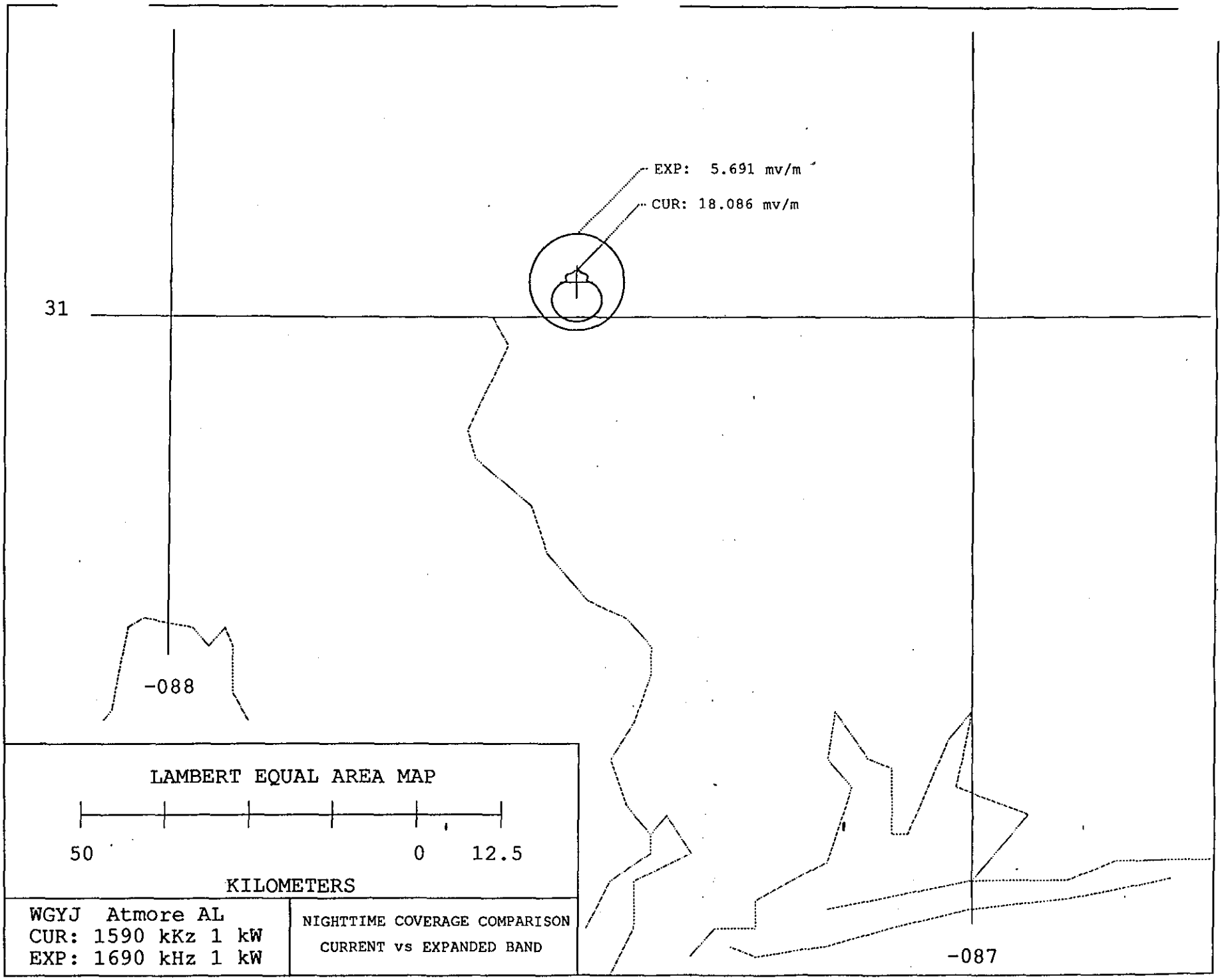
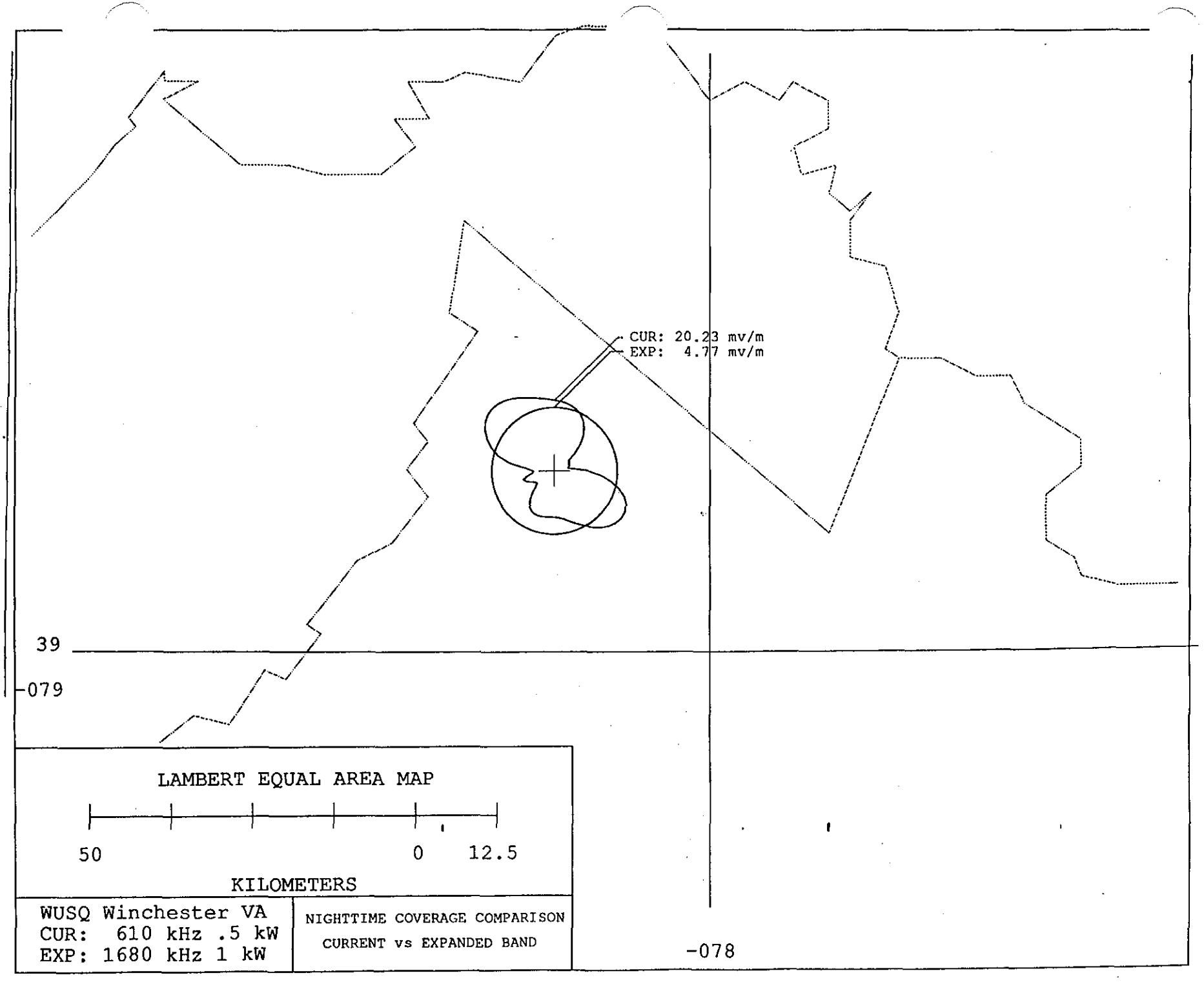
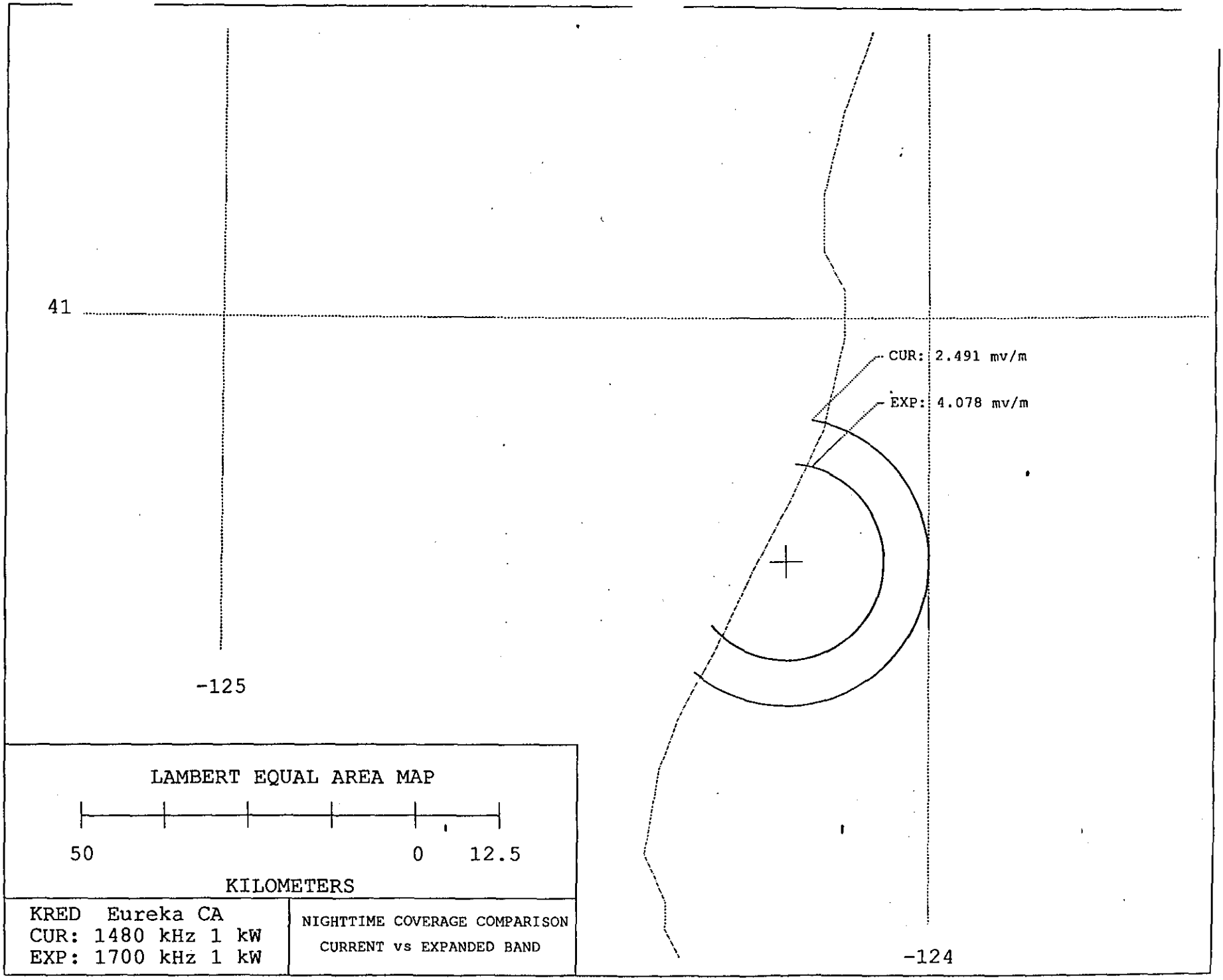
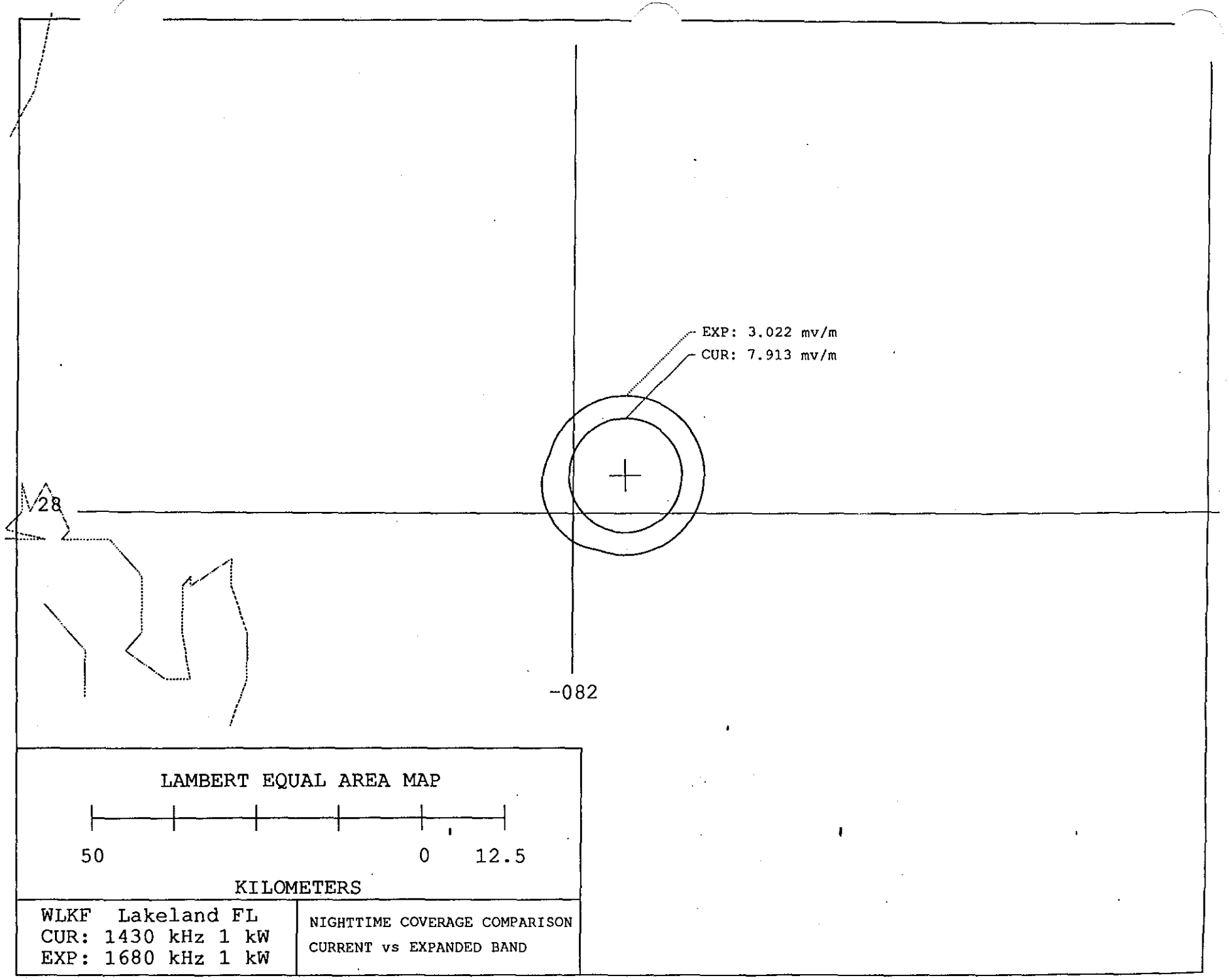
0
12.5
KILOMETERS
35
-083
WRGC Sylva NC
CUR: 680 kHz .25 kW
EXP: 1650 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND

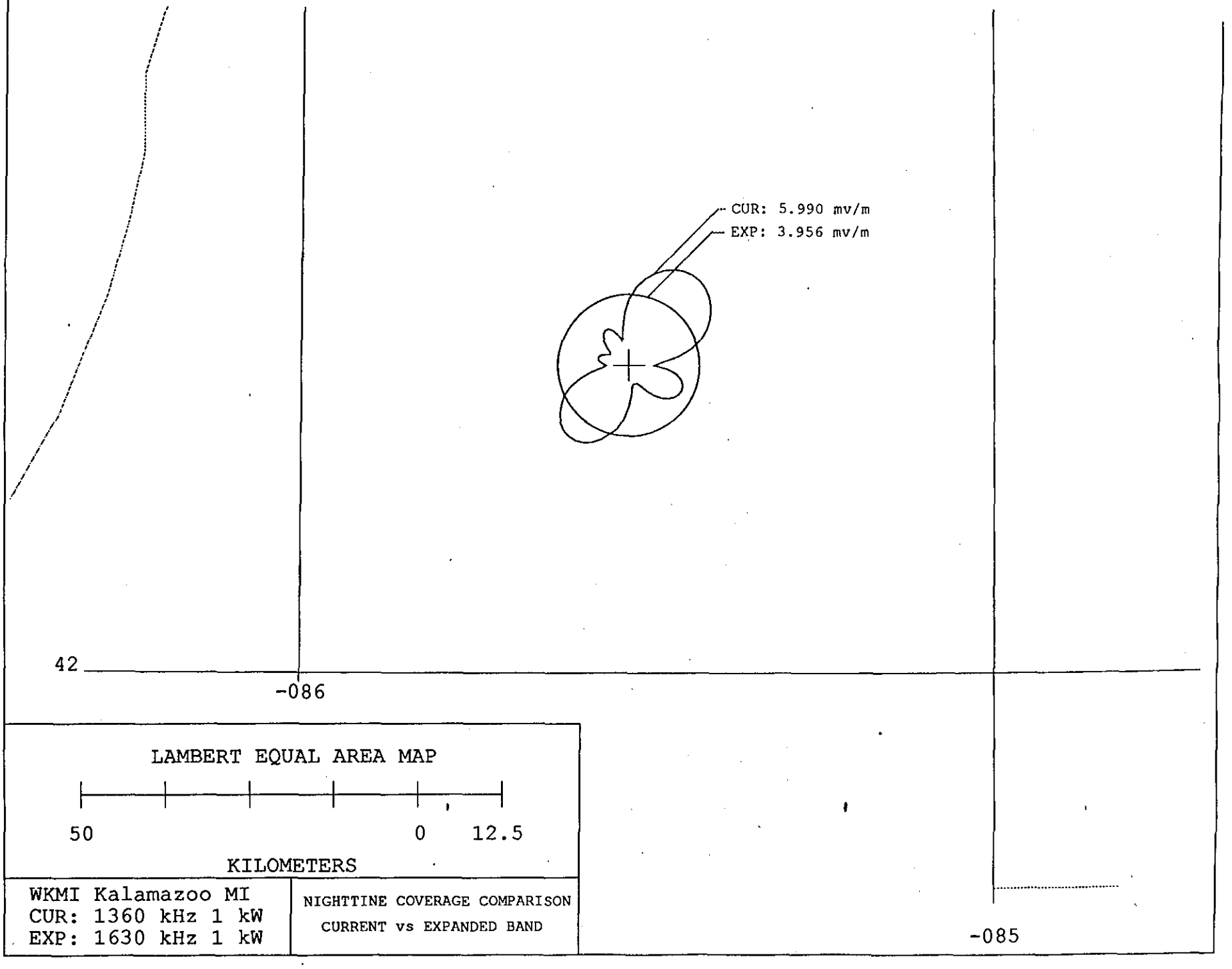

EXP: 4.430 mv/m
CUR: 36.680 mv/m
43
-086
-085
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
WPLB Greenville MI
CUR: 1380 kHz .5 kW
EXP: 1650 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND


EXP: 5.691 mv/m
CUR: 18.086 mv/m
31
-088
-087
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
WGYJ Atmore AL
CUR: 1590 kKz 1 kW
EXP: 1690 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND


CUR: 20.23 mv/m
EXP: 4.77 mv/m
39
-079
-078
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
WUSQ Winchester VA
CUR: 610 kHz .5 kW
EXP: 1680 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND


41
CUR: 2.491 mv/m
EXP: 4.078 mv/m
-125
-124
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
KRED Eureka CA
CUR: 1480 kHz 1 kW
EXP: 1700 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND


EXP: 3.022 mv/m
CUR: 7.913 mv/m
28
-082
LAMBERT EQUAL AREA MAP
50
0
12.5
KILOMETERS
WLKF Lakeland FL
CUR: 1430 kHz 1 kW
EXP: 1680 kHz 1 kW
NIGHTTIME COVERAGE COMPARISON
CURRENT vs EXPANDED BAND



LAMBERT EQUAL AREA MAP

50 0 12.5

KILOMETERS

WKMI Kalamazoo MI
CUR: 1360 kHz 1 kW
EXP: 1630 kHz 1 kW

NIGHTTINE COVERAGE COMPARISON
CURRENT vs EXPANDED BAND

Appendix E

Part 2 of Title 47 of the CFR is amended as follows:

1. The authority citation for Part 2 continues to read as follows:

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

2. Section §2.106 is amended by revising the 535-1705 kHz band, by adding US321, by revising footnotes US221, US238, US299, NG128 and 480 and by removing footnote US237 as follows:

§2.106 Table of Frequency Allocations

* * *

United States Table		FCC Use Designators	
Government	Non-government		
Allocation kHz	Allocation kHz	Rule Part(s)	Special-use Frequencies
(4)	(5)	(6)	(7)
* * *	* * *	* * *	* * *
535-1705 480 US238 US299 US321	535-1705 BROADCASTING. 480 US238 US299 US321 NG128	RADIO BROADCASTING (AM) (73). Alaska Fixed (80). Auxiliary Broadcasting (74). Private Land Mobile (90).	535-1705 kHz: Travelers Information.

* * * * *

UNITED STATES (US) FOOTNOTES

* * *

US221 In the 525-535 kHz band, the mobile service is limited to distribution of public service information from Travelers Information Stations operating on 530 kHz.

* * *

US238 The 1605-1705 kHz band is allocated to the radiolocation service on a secondary basis.

* * *

US299 The 1615-1705 kHz band in Alaska is also allocated to the maritime mobile services and the Alaska fixed service on a secondary basis to Region 2 broadcast operations.

* * *

US321 The 535-1705 kHz band is also allocated to the mobile service on a secondary basis for the distribution of public service information from Travelers Information Stations operating on 10 kHz spaced channels from 540 to 1700 kHz.

* * *

NON-GOVERNMENT (NG) FOOTNOTES

* * *

NG128 In the 535-1705 kHz band, AM broadcast licensees or permittees may use their AM carrier on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the 88-108 MHz band, FM broadcast licensees or permittees are permitted to use subcarriers on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the 54-72, 76-88, 174-216 and 740-890 MHz bands, TV broadcast licensees or permittees are permitted to use subcarriers on a secondary basis for both broadcast and non-broadcast purposes.

* * * * *

INTERNATIONAL FOOTNOTES

* * *

480 In Region 2, the use of the 1605-1705 kHz band by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

In Region 2, in the 1625-1705 kHz band, the relationship between the broadcasting, fixed and mobile services is shown in No. 419. However, the examination of frequency assignments to stations of the fixed and mobile services in the 1625-1705 kHz band under No. 1241 shall take account of the allotments appearing in the plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

* * * * *

Part 73 of Title 47 of the CFR is amended as follows:

3. The authority citation for Part 73 continues to read as follows:

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

4. Section 73.14 is amended by removing the Note following the definition of AM broadcast channel, by removing the last sentence of the definition of AM broadcast station, by removing the definitions of Dominant station and Secondary AM station, by revising the definitions of AM broadcast band, AM broadcast channel, AM broadcast station, Main channel, Maximum percentage of modulation and Stereophonic channel, and by adding definitions of Model I and Model II facilities, to read as follows:

§73.14 AM broadcast definitions.

AM broadcast band. The band of frequencies extending from 535 to 1705 kHz.

AM broadcast channel. The band of frequencies occupied by the carrier and the upper and lower sidebands of an AM broadcast signal with the carrier frequency at the center. Channels are designated by their assigned carrier frequencies. The 117 carrier frequencies assigned to AM broadcast stations begin at 540 kHz and progress in 10 kHz steps to 1700 kHz. (See §73.21 for the classification of AM broadcast channels).

AM broadcast station. A broadcast station licensed for the dissemination of radio communications intended to be received by the public and operated on a channel in the AM broadcast band.

* * * * *

Main channel. The band of audio frequencies from 50 to 10,000 Hz which amplitude modulates the carrier.

Maximum percentage of modulation. The greatest percentage of modulation that may be obtained by a transmitter without producing in its output, harmonics of the modulating frequency in excess of those permitted by these regulations. (See §73.1570)

* * * * *

Model I facility. A station operating in the 1605-1705 kHz band featuring fulltime operation with stereo, competitive technical quality, 10 kW daytime power, 1 kW nighttime power, non-directional antenna (or a simple directional antenna system), and separated by 400-800 km from other co-channel stations.

Model II facility. A station operating in the 535-1605 kHz band featuring fulltime operation, competitive technical quality, wide area daytime coverage with nighttime coverage at least 15% of the daytime coverage.

* * * * *

Stereophonic channel. The band of audio frequencies from 50 to 10,000 Hz containing the stereophonic information which modulates the radio frequency carrier.

* * * * *

5. Section 73.21 is revised to read as follows:

§73.21 Classes of AM broadcast channels and stations.

(a) Clear channel. A clear channel is one on which stations are assigned to serve wide areas. These stations are protected from objectionable interference within their primary service areas and, depending on the class of station, their secondary service areas. Stations operating on these channels are classified as follows:

(1) Class A station. A Class A station is an unlimited time station that operates on a clear channel and is designed to render primary and secondary service over an extended area and at relatively long distances from its transmitter. Its primary service area is protected from objectionable interference from other stations on the same and adjacent channels, and its secondary service area is protected from interference from other stations on the same channel. (See §73.182). The operating power shall not be less than 10 kW nor more than 50 kW. (Also see §73.25(a)).

(2) Class B station. A Class B station is an unlimited time station which is designed to render service only over a primary service area. Class B stations are authorized to operate with a minimum power of 0.25 kW (or, if less than 0.25 kW, an equivalent RMS antenna field of at least 141 mV/m at 1 km) and a maximum power of 50 kW, or 10 kW for stations that are authorized to operate in the 1605-1705 kHz band.

(3) Class D station. A Class D station operates either daytime, limited time or unlimited time with nighttime power less than 0.25 kW and an equivalent RMS antenna field of less than 141 mV/m at one km. Class D stations shall operate with daytime powers not less than 0.25 kW nor more than 50 kW. Nighttime operations of Class D stations are not afforded protection and must protect all Class A and Class B operations during nighttime hours. New Class D stations that had not been previously licensed as Class B will not be authorized.

(b) Regional Channel. A regional channel is one on which Class B and Class D stations may operate and serve primarily a principal center of population and the rural area contiguous thereto.

Note: Until the North American Regional Broadcasting Agreement (NARBA) is terminated with

respect to the Bahama Islands and the Dominican Republic, radiation toward those countries from a Class B station may not exceed the level that would be produced by an omnidirectional antenna with a transmitted power of 5 kW, or such lower level as will comply with NARBA requirements for protection of stations in the Bahama Islands and the Dominican Republic against objectionable interference.

(c) Local channel. A local channel is one on which stations operate unlimited time and serve primarily a community and the suburban and rural areas immediately contiguous thereto.

(1) Class C station. A Class C station is a station operating on a local channel and is designed to render service only over a primary service area that may be reduced as a consequence of interference in accordance with §73.182. The power shall not be less than 0.25 kW, nor more than 1 kW. Class C stations that are licensed to operate with 0.1 kW may continue to do so.

6. Section 73.22 is removed.

7. Section 73.3570 is redesignated as Section 73.23 and revised to read as follows:

§73.23 AM broadcast station applications affected by international agreements.

(a) Except as provided in paragraph (b) of this section, no application for an AM station will be accepted for filing if authorization of the facilities requested would be inconsistent with international commitments of the United States under treaties and other international agreements, arrangements and understandings. (See list of such international instruments in §73.1650(b)). Any such application that is inadvertently accepted for filing will be dismissed.

(b) AM applications that involve conflicts only with the North American Regional Broadcasting Agreement (NARBA), but that are in conformity with the remaining treaties and other international agreements listed in §73.1650(b) and with the other requirements of Part 73, will be granted subject to such modifications as the FCC may subsequently find appropriate, taking international considerations into account.

(c) In the case of any application designated for hearing on issues other than those related to consistency with international relationships and as to which no final decision has been rendered, whenever action under this section becomes appropriate because of inconsistency with international relationships, the applicant involved shall, notwithstanding the provisions §§73.3522 and 73.3571, be permitted to amend its application to achieve consistency with such relationships. In such cases the provisions of §73.3605(c) will apply.

(d) In some circumstances, special international considerations may require that the FCC, in acting on applications, follow procedures different from those established for general use. In such cases, affected applicants will be informed of the procedures to be followed.

8. In Section 73.24, the Note following paragraph (b) is removed, the last sentence of

paragraph (e) is removed, paragraph (h) is revised, paragraph (i) is removed, and paragraph (j) is redesignated as (i) and is revised to read as follows:

§73.24 Broadcast facilities; showing required.

* * * * *

(e) That the technical equipment proposed, the location of the transmitter, and other technical phases of operation comply with the regulations governing the same, and the requirements of good engineering practice.

* * * * *

(h) That, in the case of an application for a Class B or Class D station on a clear channel, the proposed station would radiate, during two hours following local sunrise and two hours preceding local sunset, in any direction toward the 0.1 mV/m groundwave contour of a co-channel United States Class A station, no more than the maximum value permitted under the provisions of §73.187.

(i) That, for all stations, the daytime 5 mV/m contour encompasses the entire principal community to be served. That, for stations in the 535-1605 kHz band, 80% of the principal community is encompassed by the nighttime 5 mV/m contour or the nighttime interference-free contour, whichever value is higher. That, for stations in the 1605-1705 kHz band, 50% of the principal community is encompassed by the 5 mV/m contour or the nighttime interference-free contour, whichever value is higher. That, Class D stations with nighttime authorizations need not demonstrate such coverage during nighttime operation.

* * * * *

9. In Section 73.25, paragraphs (a)(1), (a)(2), (a)(2)(i), (a)(2)(ii) and (a)(2)(iii) are removed, and the heading, paragraphs (a), (b), and (c) and the Note following paragraph (b) are revised to read as follows:

§73.25 Clear channels; Class A, Class B and Class D stations.

* * * * *

(a) On each of the following channels, one Class A station may be assigned, operating with power of 50 kW: 640, 650, 660, 670, 700, 720, 750, 760, 770, 780, 820, 830, 840, 870, 880, 890, 1020, 1030, 1040, 1100, 1120, 1160, 1180, 1200, and 1210 kHz. In Alaska, these frequencies can be used by Class A stations subject to the conditions set forth in §73.182(a)(1)(ii). On the channels listed in this paragraph, Class B and Class D stations may be assigned.

(b) To each of the following channels there may be assigned Class A, Class B and Class D

stations: 680, 710, 810, 850, 940, 1000, 1060, 1070, 1080, 1090, 1110, 1130, 1140, 1170, 1190, 1500, 1510, 1520, 1530, 1540, 1550, and 1560 kHz.

Note: Until superseded by a new agreement, protection of the Bahama Islands shall be in accordance with NARBA. Accordingly, a Class A, Class B or Class D station on 1540 kHz shall restrict its signal to a value no greater than 4 μV/m groundwave or 25 μV/m-10% skywave at any point of land in the Bahama Islands, and such stations operating nighttime (i.e., sunset to sunrise at the location of the U.S. station) shall be located not less than 650 miles from the nearest point of land in the Bahama Islands.

(c) Class A, Class B and Class D stations may be assigned on 540, 690, 730, 740, 800, 860, 900, 990, 1010, 1050, 1220, 1540, 1570, and 1580 kHz.

10. Section 73.26 is revised to read as follows:

§73.26 Regional channels; Class B and Class D stations.

(a) The following frequencies are designated as regional channels and are assigned for use by Class B and Class D stations: 550, 560, 570, 580, 590, 600, 610, 620, 630, 790, 910, 920, 930, 950, 960, 970, 980, 1150, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1350, 1360, 1370, 1380, 1390, 1410, 1420, 1430, 1440, 1460, 1470, 1480, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, and 1700 kHz.

(b) Additionally, in Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands the frequencies 1230, 1240, 1340, 1400, 1450, and 1490 kHz are designated as Regional channels, and are assigned for use by Class B stations. Stations formerly licensed to these channels in those locations as Class C stations are redesignated as Class B stations.

11. Section 73.27 is revised to read as follows:

§73.27 Local channels; Class C stations.

Within the conterminous 48 states, the following frequencies are designated as local channels, and are assigned for use by Class C stations: 1230, 1240, 1340, 1400, 1450, and 1490 kHz.

12. In Section 73.28, paragraph (a) is removed, paragraph (b) is redesignated as paragraph (a) and revised to read as follows:

§73.28 Assignment of stations to channels.

(a) The Commission will not make an AM station assignment that does not conform with international requirements and restrictions on spectrum use that the United States has accepted as a signatory to treaties, conventions, and other international agreements. See §73.1650 for a list of pertinent treaties, conventions and agreements, and §73.23 for procedural provisions

relating to compliance with them.

* * * * *

13. Section 73.29 is revised to read as follows:

§73.29 Class C stations on regional channels.

No license will be granted for the operation of a Class C station on a regional channel.

14. A new Section 73.30 is added to read as follows:

§73.30 Petition for authorization of an allotment in the 1605-1705 kHz band.

(a) Any party interested in operating an AM broadcast station on one of the ten channels in the 1605-1705 kHz band must file a petition for the establishment of an allotment to its community of license. Each petition must include the following information:

(1) name of community for which allotment is sought; (2) frequency and call letters of the petitioner's existing AM operation; and (3) statement as to whether or not AM stereo operation is proposed for the operation in the 1605-1705 kHz band.

(b) Petitions are to be filed during a filing period to be determined by the Commission. For each filing period, eligible stations will be allotted channels based on the following steps:

(1) Stations are ranked in descending order according to the calculated improvement factor.

(2) The station with the higest improvement factor is initially allotted the lowest available channel.

(3) Successively, each station with the next lowest improvement factor, is allotted an available channel taking into account the possible frequency and location combinations and relationship to previously selected allotments. If a channel is not available for the subject station, previous allotments are examined with respect to an alternate channel, the use of which would make a channel available for the subject station.

(4) When it has been determined that, in accordance with the above steps, no channel is available for the subject station, that station is no longer considered and the process continues to the station with the next lowest improvement factor.

(c) If awarded an allotment, a petitioner will have sixty (60) days from the date of public notice of selection to file an application for construction permit on FCC Form 301. (See §§73.24 and 73.37(e) for filing requirements). Unless instructed by the Commission to do otherwise, the application shall specify Model I facilities. (See Section 73.14). Upon grant of the application

and subsequent construction of the authorized facility, the applicant must file a license application on FCC Form 302.

Note 1: Until further notice by the Commission, the filing of these petitions is limited to licensees of existing AM stations (excluding Class C stations) operating in the 535-1605 kHz band. Selection among competing petitions will be based on interference reduction. Notwithstanding the exception in Note 4, within each operational category, the station demonstrating the highest value of improvement factor will be afforded the highest priority for an allotment, with the next priority assigned to the station with next lowest value, and so on, until available allotments are filled.

Note 2: The Commission will periodically evaluate the progress of the movement of stations from the 535-1605 kHz band to the 1605-1705 kHz band to determine whether the 1605-1705 kHz band should continue to be administered on an allotment basis or modified to an assignment method. If appropriate, the Commission will later develop further procedures for use of the 1605-1705 kHz band by existing station licensees and others.

Note 3: Existing fulltime stations are considered first for selection as described in Note 1. In the event that an allotment availability exists for which no fulltime station has filed a relevant petition, such allotment may be awarded to a licensed Class D station. If more than one Class D station applies for this migration opportunity, the following priorities will be used in the selection process: First priority - A Class D station located within the 0.5 mV/m-50% contour of a U.S. Class A station and licensed to serve a community of 100,000 or more, for which there exists no local fulltime aural service; Second priority - Class D stations ranked in order of improvement factor, from highest to lowest, considering only those stations with improvement factors greater than zero.

Note 4: The preference for AM stereo in the expanded band will be administered as follows: when an allotment under consideration (candidate allotment) conflicts with one or more previously selected allotments (established allotments) and cannot be accommodated in the expanded band, the candidate allotment will be substituted for the previously established allotment provided that: the petitioner for the candidate allotment has made a written commitment to the use of AM stereo and the petitioner for the established allotment has not; the difference between the ranking factors associated with the candidate and established allotments does not exceed 10% of the ranking factor of the candidate allotment; the substitution will not require the displacement of more than one established allotment; and both the candidate allotment and the established allotment are within the same priority group.

15. Section 73.35 is added to read as follows:

§73.35 Calculation of improvement factors.

(a) A petition for an allotment (See §73.30) in the 1605-1705 kHz band filed by an existing fulltime AM station licensed in the 535-1605 kHz band will be ranked according to the station's

calculated improvement factor. (See §73.30) Improvement factors relate to both nighttime and daytime interference conditions and are based on two distinct considerations: (1) service area lost by other stations due to interference caused by the subject station, and (2) service area of the subject station. These considerations are represented by a ratio. The ratio consists, where applicable, of two separate additive components, one for nighttime and one for daytime. For the nighttime component, to determine the numerator of the ratio (first consideration), calculate the RSS and associated service area of the stations (co- and adjacent channel) to which the subject station causes nighttime interference. Next, repeat the RSS and service area calculations excluding the subject station. The cumulative gain in the above service areas is the numerator of the ratio. The denominator (second consideration) is the subject station's interference-free service area. For the daytime component, the composite amount of service lost by co-channel and adjacent channel stations, each taken individually, that are affected by the subject station, excluding the effects of other assignments during each study, will be used as the numerator of the daytime improvement factor. The denominator will consist of the actual daytime service area (0.5 mV/m contour) less any area lost to interference from other assignments. The value of this combined ratio will constitute the petitioner's improvement factor. Notwithstanding the requirements of §73.153, for uniform comparisons and simplicity, measurement data will not be used for determining improvement factors and FCC figure M-3 ground conductivity values are to be used exclusively in accordance with the pertinent provisions of §73.183(c)(1).

16. Section 73.37 is revised to read as follows:

§73.37 Applications for broadcast facilities, showing required.

(a) No application will be accepted for a new station if the proposed operation would involve overlap of signal strength contours with any other station as set forth below in this paragraph; and no application will be accepted for a change of the facilities of an existing station if the proposed change would involve such overlap where there is not already such overlap between the stations involved:

Frequency Separation (kHz)	Contour of Proposed Station (Classes B, C and D) (mV/m)	Contour of Any Other Station (mV/m)
0	0.005 0.025 0.500	0.100 (Class A) 0.500 (Other Classes) 0.025 (All classes)
10	0.250 0.500	0.500 (All classes) 0.250 (All classes)
20	5 5	5 (All classes) 5 (All classes)
30	25	25 (All classes)

(b) In determining overlap received, an application for a new Class C station with daytime power of 250 watts, or greater, shall be considered on the assumption that both the proposed operation and all existing Class C stations operate with 250 watts and utilize non-directional antennas.

(c) If otherwise consistent with the public interest, an application requesting an increase in the daytime power of an existing Class C station on a local channel from 250 watts to a maximum of 1 kW, or from 100 watts to a maximum of 500 watts, may be granted notwithstanding overlap prohibited by paragraph (a) of this section. In the case of a 100 watt Class C station increasing daytime power, the provisions of this paragraph shall not be construed to permit an increase in power to more than 500 watts, if prohibited overlap would be involved, even if successive applications should be tendered.

(d) In addition to demonstrating compliance with paragraphs (a), and, as appropriate, (b), and (c) of this section, an application for a new AM broadcast station, or for a major change (see §73.3571(a)(1) of this chapter) in an authorized AM broadcast station, as a condition for its acceptance, shall make a satisfactory showing, if new or modified nighttime operation by a Class B station is proposed, that objectionable interference will not result to an authorized station, as determined pursuant to §73.182(1) of this chapter.

(e) An application for an authorization in the 1605-1705 kHz band which has been selected through the petition process (See §73.30) is not required to demonstrate compliance with (a), (b), (c), or (d) of this section. Instead, the applicant need only comply with the terms of the allotment authorization issued by the Commission in response to the earlier petition for establishment of a station in the 1605-1705 kHz band. Within the allotment authorization, the Commission will specify the assigned frequency and the applicable technical requirements.

(f) Stations on 1580, 1590 and 1600 kHz. In addition to the rules governing the authorization

of facilities in the 535-1605 kHz band, stations on these frequencies seeking facilities modifications must protect assignments in the 1610-1700 kHz band. Such protection shall be afforded in a manner which considers the spacings that occur or exist between the subject station and a station within the range 1605-1700 kHz. The spacings are the same as those specified for stations in the frequency band 1610-1700 kHz or the current separation distance, whichever is greater. Modifications that would result in a spacing or spacings that fails to meet any of the separations must include a showing that appropriate adjustment has been made to the radiated signal which effectively results in a site-to-site radiation that is equivalent to the radiation of a station with standard Model I facilities (10 kW-D, 1 kW-N, non-DA, 90 degree antenna ht. & ground system) operating in compliance with all of the above separation distances. In those cases where that radiation equivalence value is already exceeded, a station may continue to maintain, but not increase beyond that level.

Note 1: In the case of applications for changes in the facilities of AM broadcast stations covered by this section, an application will be accepted even though overlap of field strength contours as mentioned in this section would occur with another station in an area where such overlap does not already exist, if: (1) The total area of overlap with that station would not be increased; (2) there would be no net increase in the area of overlap with any other station; and (3) there would be created no area of overlap with any station with which overlap does not now exist.

Note 2: The provisions of this section concerning prohibited overlap of field strength contours will not apply where: (1) the area of overlap lies entirely over sea water: or (2) the only overlap involved would be that caused to a foreign station, in which case the provisions of the applicable international agreement, as identified in §73.1650, will apply. When overlap would be received from a foreign station, the provisions of this section will apply, except where there would be overlap with a foreign station with a frequency separation of 20 kHz, in which case the provisions of the international agreement will apply in lieu of this section.

Note 3: In determining the number of "authorized" aural transmission facilities in a given community, applications for that community in hearing or otherwise having protected status under specified "cut-off" procedures shall be considered as existing stations. In the event that there are two or more mutually exclusive protected applications seeking authorization for the proposed community it will be assumed that only one is "authorized."

Note 4: A "transmission facility" for a community is a station licensed to the community. Such a station provides a "transmission service" for that community.

17. In Section 73.53, paragraph (b)(1) is revised and a new Note is added after paragraph (c) to read as follows:

§73.53 Requirements for authorization of antenna monitors.

* * * * *

(b) * * *

(1) The monitor shall be designed to operate in the 535-1705 kHz band.

* * * * *

Note: In (b)(1) above, the requirement that monitors be capable of operation in the 535-1705 kHz band shall apply only to equipment manufactured after July 1, 1992. Use of a monitor in the 1605-1705 kHz band which is not approved for such operation will be permitted pending the general availability of 535-1705 kHz band monitors if a manufacturer can demonstrate, in the interim, that its monitor performs in accordance with the standards in this section on these 10 channels.

18. In Section 73.68, paragraph (d)(3) is revised to read as follows:

§73.68 Sampling systems for antenna monitors.

* * * * *

(d) * * *

(3) If that portion of the sampling system above the base of the towers is modified or components replaced, a partial proof of performance shall be executed in accordance with §73.154 subsequent to these changes. The partial proof of performance shall be accompanied by common point impedance measurements made in accordance with §73.54.

* * * * *

19. In Section 73.69, paragraph (d)(4) is revised to read as follows:

§73.69 Antenna monitors.

* * * * *

(4) If it cannot be established by the observations required in paragraph (d)(2) of this section that base current ratios and monitoring point values are within the tolerances or limits prescribed by the rules and the instrument of authorization, or if the substitution of the new antenna monitor for the old results in changes in these parameters, a partial proof of performance shall be executed and analyzed in accordance with §73.154.

* * * * *

20. In Section 73.72, paragraph (a) is revised to read as follows:

§73.72 Operating during the experimental period.

(a) An AM station may operate during the experimental period (the time between midnight and sunrise, local time) on its assigned frequency and with its authorized power for the routine testing and maintenance of its transmitting system, and for conducting experimentation under an experimental authorization, provided no interference is caused to other stations maintaining a regular operating schedule within such period.

* * * * *

21. In Section 73.88, a new Note is added after the introductory language to read as follows:

§73.88 Blanketing interference.

* * * * *

Note: For more detailed instructions concerning operational responsibilities of licensees and permitees under this section, see §73.318 (b), (c) and (d).

22. Section 73.99 is revised to read as follows:

§73.99 Presunrise service authorization (PSRA) and Postsunset service authorization (PSSA).

(a) To provide maximum uniformity in early morning operation compatible with interference considerations, and to provide for additional service during early evening hours for Class D stations, provisions are made for presunrise service and postsunset service. The permissible power for presunrise or postsunset service authorizations shall not exceed 500 watts, or the authorized daytime or critical hours power (whichever is less). Calculation of the permissible power shall consider only co-channel stations for interference protection purposes.

(b) Presunrise service authorizations (PSRA) permit:

(1) Class D stations operating on Mexican, Bahamian, and Canadian priority Class A clear channels to commence PSRA operation at 6:00 a.m. local time and to continue such operation until the sunrise times specified in their basic instruments of authorization.

(2) Class D stations situated outside 0.5 mV/m-50% skywave contours of co-channel U.S. Class A stations to commence PSRA operation at 6:00 a.m. local time and to continue such operation until sunrise times specified in their basic instruments of authorization.

(3) Class D stations located within co-channel 0.5 mV/m-50% skywave contours of U.S. Class A stations, to commence PSRA operation either at 6:00 a.m. local time, or at sunrise at the nearest Class A station located east of the Class D station (whichever is later), and to continue

such operation until the sunrise times specified in their basic instruments of authorization.

(4) Class B and Class D stations on regional channels to commence PSRA operation at 6.00 a.m. local time and to continue such operation until local sunrise times specified in their basic instruments of authorization.

(c) Extended Daylight Saving Time Pre-Sunrise Authorizations:

(1) Between the first Sunday in April and the end of the month of April, Class D stations will be permitted to conduct pre-sunrise operation beginning at 6:00 a.m. local time with a maximum power of 500 watts (not to exceed the station's regular daytime or critical hours power), reduced as necessary to comply with the following requirements:

(i) Full protection is to be provided as specified in applicable international agreements.

(ii) Protection is to be provided to the 0.5 mV/m groundwave signals of co-channel U.S. Class A stations; protection to the 0.5 mV/m-50% skywave contours of these stations is not required.

(iii) In determining the protection to be provided, the effect of each interfering signal will be evaluated separately. The presence of interference from other stations will not reduce or eliminate the required protection.

(iv) Notwithstanding the requirements of paragraph (c)(1)(ii) and (iii) of this section, the stations will be permitted to operate with a minimum power of 10 watts unless a lower power is required by international agreement.

(2) The Commission will issue appropriate authorizations to Class D stations not previously eligible to operate during this period. Class D stations authorized to operate during this pre-sunrise period may continue to operate under their current authorization.

(d) Postsunset service authorizations (PSSA) permit:

(1) Class D stations located on Mexican, Bahamian, and Canadian priority Class A clear channels to commence PSSA operation at sunset times specified in their basic instruments of authorization and to continue for two hours after such specified times.

(2) Class D stations situated outside 0.5 mV/m-50% skywave contours of co-channel U.S. Class A stations to commence PSSA operations at sunset times specified in their basic instruments of authorization and to continue for two hours after such specified times.

(3) Class D stations located within co-channel 0.5 mV/m-50% skywave contours of U.S. Class A stations to commence PSSA operation at sunset times specified in their basic instruments of authorization and to continue such operation until two hours past such specified times, or until sunset at the nearest Class A station located west of the Class D station, whichever is earlier.

Class D stations located west of the Class A station do not qualify for PSSA operation.

(4) Class D stations on regional channels to commence PSSA operation at sunset times specified on their basic instruments of authorization and to continue such operation until two hours past such specified times.

(e) Procedural Matters. (1). Applications for PSRA and PSSA operation are not required. Instead, the FCC will calculate the periods of such operation and the power to be used pursuant to the provisions of this section and the protection requirements contained in applicable international agreements. Licensees will be notified of permissible power and times of operation. Presunrise and Postsunset service authority permits operation on a secondary basis and does not confer license rights. No request for such authority need be filed. However, stations intending to operate PSRA or PSSA shall submit by letter, signed as specified in §73.3513, the following information:

(i) Licensee name, station call letters and station location,

(ii) Indication as to whether PSRA operation, PSSA operation, or both, is intended by the station,

(iii) A description of the method whereby any necessary power reduction will be achieved.

(2) Upon submission of the required information, such operation may begin without further authority.

(f) Technical Criteria. Calculations to determine whether there is objectionable interference will be determined in accordance with the AM Broadcast Technical Standards, §§73.182 through 73.190, and applicable international agreements. Calculations will be performed using daytime antenna systems, or critical hours antenna systems when specified on the license. In performing calculations to determine assigned power and times for commencement of PSRA and PSSA operation, the following standards and criteria will be used:

(1) Class D stations operating in accordance with paragraphs (b)(1), (b)(2), (d)(1), and (d)(2) of this section are required to protect the nighttime 0.5 mV/m-50% skywave contours of co-channel Class A stations. Where a 0.5 mV/m-50% skywave signal from the Class A station is not produced, the 0.5 mV/m groundwave contour shall be protected.

(2) Class D stations are required to fully protect foreign Class B and Class C stations when operating PSRA and PSSA; Class D stations operating PSSA are required to fully protect U.S. Class B stations. For purposes of determining protection, the nighttime RSS limit will be used in the determination of maximum permissible power.

(3) Class D stations operating in accordance with paragraphs (d)(2) and (d)(3) of this section are required to restrict maximum 10% skywave radiation at any point on the daytime 0.1 mV/m

groundwave contour of a co-channel Class A station to 25 μV/m. The location of the 0.1 mV/m contour of the Class A station will be determined by use of Figure M3, *Estimated Ground Conductivity in the United States*. When the 0.1 mV/m contour extends beyond the national boundary, the international boundary shall be considered the 0.1 mV/m contour.

(4) Class B and Class D stations on regional channels operating PSRA and PSSA (Class D only) are required to provide full protection to co-channel foreign Class B and Class C stations.

(5) Class D stations on regional channels operating PSSA beyond 6:00 p.m. local time are required to fully protect U.S. Class B stations.

(6) The protection that Class D stations on regional channels are required to provide when operating PSSA until 6:00 p.m. local time is as follows:

(i) For the first half-hour of PSSA operation, protection will be calculated at sunset plus 30 minutes at the site of the Class D station;

(ii) For the second half-hour of PSSA operation, protection will be calculated at sunset plus one hour at the site of the Class D station;

(iii) For the second hour of PSSA operation, protection will be calculated at sunset plus two hours at the site of the Class D station;

(iv) Minimum powers during the period until 6:00 p.m. local time shall be permitted as follows:

Calculated Power	Adjusted Minimum Power
From 1 to 45 watts	50 watts
Above 45 to 70 watts	75 watts
Above 70 to 100 watts	100 watts

(7) For protection purposes, the nighttime RSS limit will be used in the determination of maximum permissible power.

(g) Calculations made under paragraph (d) of this section may not take outstanding PSRA or PSSA operations into account, nor will the grant of a PSRA or PSSA confer any degree of interference protection on the holder thereof.

(h) Operation under a PSRA or PSSA is not mandatory, and will not be included in determining compliance with the requirements of §73.1740. To the extent actually undertaken, however, presunrise operation will be considered by the FCC in determining overall compliance with past

programming representations and station policy concerning commercial matter.

(i) The PSRA or PSSA is secondary to the basic instrument of authorization with which it is to be associated. The PSRA or PSSA may be suspended, modified, or withdrawn by the FCC without prior notice or right to hearing, if necessary to resolve interference conflicts, to implement agreements with foreign governments, or in other circumstances warranting such action. Moreover, the PSRA or PSSA does not extend beyond the term of the basic authorization.

(j) The Commission will periodically recalculate maximum permissible power and times for commencing PSRA and PSSA for each Class D station operating in accordance with paragraph (c) of this section. The Commission will calculate the maximum power at which each individual station may conduct presunrise operations during extended daylight saving time and shall issue conforming authorizations. These original notifications and subsequent notifications should be associated with the station's authorization. Upon notification of new power and time of commencing operation, affected stations shall make necessary adjustments within 30 days.

(k) A PSRA and PSSA does not require compliance with §§73.45, 73.182 and 73.1560 where the operation might otherwise be considered as technically substandard. Further, the requirements of paragraphs (a)(5), (b)(2), (c)(2), and (d)(2) of §73.1215 concerning the scale ranges of transmission system indicating instruments are waived for PSRA and PSSA operation except for the radio frequency ammeters used in determining antenna input power.

(l) A station having an antenna monitor incapable of functioning at the authorized PSRA and PSSA power when using a directional antenna shall take the monitor reading using an unmodulated carrier at the authorized daytime power immediately prior to commencing PSRA or PSSA operations. Special conditions as the FCC may deem appropriate may be included for PSRA or PSSA to insure operation of the transmitter and associated equipment in accordance with all phases of good engineering practice.

23. Section 73.150 is amended by revising paragraphs (a), (b)(1), (b)(2), (b)(3), (b)(5)(iv), (b)(5)(v), and (b)(6)(vii), and equation 2, by changing all references to miles in paragraph (b)(1)(i) to kilometers, and by revising the formulas in paragraph (b)(1)(i) to read as follows:

§73.150 Directional antenna systems.

(a) For each station employing a directional antenna, all determinations of service provided and interference caused shall be based on the inverse distance fields of the standard radiation pattern for that station. (As applied to nighttime operation the term "standard radiation pattern" shall include the radiation pattern in the horizontal plane, and radiation patterns at angles above this plane.)

* * * * *

(b) * * *

(1) The standard radiation pattern for the proposed antenna in the horizontal plane, and where pertinent, tabulated values for the azimuthal radiation patterns for angles of elevation up to and including 60 degrees, with a separate section for each increment of 5 degrees.

(i) * * *

where:

$E(\phi,\theta)_{th}$ represents the theoretical inverse distance fields at one kilometer for the given azimuth and elevation.

* * *

The standard radiation pattern shall be constructed in accordance with the following mathematical expression:

$$E(\phi,\theta)_{std} = 1.05\sqrt{[E(\phi,\theta)_{th}]^2 + Q^2} \qquad \text{(Eq. 2)}$$

where:

$E(\phi,\theta)_{std}$ represents the inverse distance fields at one kilometer which are produced by the directional antenna in the horizontal and vertical planes. $E(\phi,\theta)_{th}$ represents the theoretical inverse distance fields at one kilometer as computed in accordance with Eq. 1, above.

Q is the greater of the following two quantities:

$$0.025g(\theta)E_{max} \quad or \quad 10.0g(\theta)\sqrt{P_{kW}}$$

* * * * *

(ii) * * *

(2) All patterns shall be computed for integral multiples of five degrees, beginning with zero degrees representing true north, and, shall be plotted to the largest scale possible on unglazed letter-size paper (main engraving approximately 7" x 10") using only scale divisions and subdivisions of 1, 2, 2.5, or 5 times 10^{nth}. The horizontal plane pattern shall be plotted on polar coordinate paper, with the zero degree point corresponding to true north. Patterns for elevation angles above the horizontal plane may be plotted in polar or rectangular coordinates, with the pattern for each angle of elevation on a separate page. Rectangular plots shall begin and end at true north, with all azimuths labelled in increments of not less than 20 degrees. If a rectangular plot is used, the ordinate showing the scale for radiation may be logarithmic. Such patterns for

elevation angles above the horizontal plane need be submitted only upon specific request by Commission staff. Minor lobe and null detail occurring between successive patterns for specific angles of elevation need not be submitted. Values of field strength on any pattern less than ten percent of the maximum field strength plotted on that pattern shall be shown on an enlarged scale. Rectangular plots with a logarithmic ordinate need not utilize an expanded scale unless necessary to show clearly the minor lobe and null detail.

(3) The effective (RMS) field strength in the horizontal plane of $E(\phi,\theta)_{std}$, $E(\phi,\theta)_{th}$ and the root-sum-square (RSS) value of the inverse distance fields of the array elements at 1 kilometer, derived from the equation for $E(\phi,\theta)_{th}$. These values shall be tabulated on the page on which the horizontal plane pattern is plotted, which shall be specifically labelled as the Standard Horizontal Plane Pattern.

(4) * * *

(5) * * *

(iv) Where waiver of the content of this section is requested or upon request of the Commission staff, all assumptions made and the basis therefor, particularly with respect to the electrical height of the elements, current distribution along elements, efficiency of each element, and ground conductivity.

(v) Where waiver of the content of this section is requested, or upon request of the Commission staff, those formulas used for computing $E(\phi,\theta)_{th}$ and $E(\phi,\theta)_{std}$. Complete tabulation of final computed data used in plotting patterns, including data for the determination of the RMS value of the pattern, and the RSS field of the array.

(6) * * *

(vii) Additional requirements relating to modified standard patterns appear in Section 73.152(c)(3) and (c)(4).

* * * * *

24. Section 73.151 is amended by adding a new paragraph (b) to read as follows:

§73.151 Field strength measurements to establish performance of directional antennas.

* * * * *

(b) For stations authorized to operate with simple directional antenna systems (e.g., two towers) in the 1605-1705 kHz band, the measurements to support pattern RMS compliance referred to in (a)(1)(ii) and (a)(1)(iii) are not required. In such cases, measured radials are required only in the direction of short-spaced allotments, or in directions specifically identified by the

Commission.

25. Section 73.152 is amended by adding new paragraphs (c)(2)(iv), (c)(2)(iv)(A), and (c)(2)(iv)(B).

§73.152 Modification of directional antenna data for stations.

* * * * *

(c)(2)(iv) Where the measured inverse distance field exceeds the value permitted by the standard pattern, and augmentation is allowable under the terms of this section, the requested amount of augmentation shall be centered upon the azimuth of the radial upon which the excessive radiation was measured and shall not exceed the following:

(A) the actual measured inverse distance field value, where the radial does not involve a required monitoring point.

(B) 120% of the actual measured inverse field value, where the radial has a monitoring point required by the instrument of authorization.

Whereas some pattern smoothing can be accommodated, the extent of the requested span(s) shall be minimized and in no case shall a requested augmentation span extend to a radial azimuth for which the analyzed measurement data does not show a need for augmentation.

* * * * *

26. Section 73.153 is amended by revising the last sentence in the paragraph to read as follows:

§73.153 Field strength measurements in support of applications or evidence at hearings.

* * * The antenna resistance measurements required by Section 73.186 need not be taken or submitted.

27. Section 73.182 is revised to read as follows:

§73.182 Engineering standards of allocation.

(a) §§73.21 to 73.37, inclusive, govern allocation of facilities in the AM broadcast band 535-1705 kHz. §73.21 establishes three classes of channels in this band, namely, clear, regional and local. The classes and power of AM broadcast stations which will be assigned to the various channels are set forth in §73.21. The classifications of the AM broadcast stations are as follows:

(1) Class A stations operate on clear channels with powers no less than 10kW nor greater than

50 kW. These stations are designed to render primary and secondary service over an extended area, with their primary service areas protected from objectionable interference from other stations on the same and adjacent channels. Their secondary service areas are protected from objectionable interference from co-channel stations. For purposes of protection, Class A stations may be divided into two groups, those located in any of the contiguous 48 States and those located in Alaska in accordance with §73.25.

(i) The mainland U.S. Class A stations are those assigned to the channels allocated by §73.25. The power of these stations shall be 50 kW. The Class A stations in this group are afforded protection as follows:

(A) Daytime. To the 0.1 mV/m groundwave contour from stations on the same channel, and to the 0.5 mV/m groundwave contour from stations on adjacent channels.

(B) Nighttime. To the 0.5 mV/m-50% skywave contour from stations on the same channels.

(ii) Class A stations in Alaska operate on the channels allocated by §73.25 with a minimum power of 10 kW, a maximum power of 50 kW, and an antenna efficiency of 282 mV/m/kW at 1 kilometer. Stations operating on these channels in Alaska which have not been designated as Class A stations in response to licensee request will continue to be considered as Class B stations. During daytime hours a Class A station in Alaska is protected to the 100 μV/m groundwave contour from co-channel stations. During nighttime hours, a Class A station in Alaska is protected to the 100 μV/m-50 percent skywave contour from co-channel stations. The 0.5 mV/m groundwave contour is protected both daytime and nighttime from stations on adjacent channels.

NOTE: In the Report and Order in MM Docket No. 83-807, the Commission designated 15 stations operating on U.S. clear channels as Alaskan Class A stations. Eleven of these stations already have Alaskan Class A facilities and are to be protected accordingly. Permanent designation of the other four stations as Alaskan Class A is conditioned on their constructing minimum Alaskan Class A facilities no later than December 31, 1989. Until that date or until such facilities are obtained, these four stations shall be temporarily designated as Alaskan Class A stations, and calculations involving these stations should be based on existing facilities but with an assumed power of 10 kW. Thereafter, these stations are to be protected based on their actual Alaskan Class A facilities. If any of these stations does not obtain Alaskan Class A facilities in the period specified, it is to be protected as a Class B station based on its actual facilities. These four stations may increase power to 10 kW without regard to the impact on co-channel Class B stations. However, power increases by these stations above 10 kW (or by existing Alaskan Class A stations beyond their current power level) are subject to applicable protection requirements for co-channel Class B stations. Other stations not on the original list but which meet applicable requirements may obtain Alaskan Class A status by seeking such designation from the Commission. If a power increase or other change in facilities by a station not on the original list is required to obtain minimum Alaskan Class A facilities, any such application shall meet the interference protection requirements applicable to an Alaskan Class A proposal on the

channel.

(2) Class B stations are stations which operate on clear and regional channels with powers not less than 0.25 kW nor more than 50 kW. These stations render primary service only, the area of which depends on their geographical location, power, and frequency. It is recommended that Class B stations be located so that the interference received from other stations will not limit the service area to a groundwave contour value greater than 2.0 mV/m nighttime and to the 0.5 mV/m groundwave contour daytime, which are the values for the mutual protection between this class of stations and other stations of the same class.

NOTE: See §§73.21(b)(1) and 73.26(b) concerning power restrictions and classifications relative to Class B, Class C, and Class D stations in Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands. Stations in the above-named places that are reclassified from Class C to Class B stations under §73.26(b) shall not be authorized to increase power to levels that would increase the nighttime interference-free limit of co-channel Class C stations in the conterminous United States.

(3) Class C stations operate on local channels, normally rendering primary service to a community and the suburban or rural areas immediately contiguous thereto, with powers not less than 0.25 kW, nor more than 1 kW, except as provided in §73.21(c)(1). Such stations are normally protected to the daytime 0.5 mV/m contour. On local channels the separation required for the daytime protection shall also determine the nighttime separation. Where directional antennas are employed daytime by Class C stations operating with more than 0.25 kW power, the separations required shall in no case be less than those necessary to afford protection, assuming nondirectional operation with 0.25 kW. In no case will 0.25 kW or greater nighttime power be authorized to a station unable to operate nondirectionally with a power of 0.25 kW during daytime hours. The actual nighttime limitation will be calculated. For nighttime protection purposes, Class C stations in the 48 contiguous United States may assume that stations in Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands operating on 1230, 1240, 1340, 1400, 1450, and 1490 kHz are Class C stations.

(4) Class D stations operate on clear and regional channels with daytime powers of not less than 0.25 kW (or equivalent RMS field of 141 mV/m at one kilometer if less than 0.25 kW) and not more than 50 kW. Class D stations that have previously received nighttime authority operate with powers of less than 0.25 kW (or equivalent RMS fields of less than 141 mV/m at one kilometer) are not required to provide nighttime coverage in accordance with §73.24(j) and are not protected from interference during nighttime hours. Such nighttime authority is permitted on the basis of full nighttime protection being afforded to all Class A and Class B stations.

(b) When a station is already limited by interference from other stations to a contour value greater than that normally protected for its class, the individual received limits shall be the established standard for such station with respect to interference from each other station.

(c) The four classes of AM broadcast stations have in general three types of service area, i.e., primary, secondary and intermittent. (See §73.14 for the definitions of primary, secondary, and

intermittent service areas.) Class A stations render service to all three areas. Class B stations render service to a primary area but the secondary and intermittent service areas may be materially limited or destroyed due to interference from other stations, depending on the station assignments involved. Class C and Class D stations usually have only primary service areas. Interference from other stations may limit intermittent service areas and generally prevents any secondary service to those stations which operate at night. Complete intermittent service may still be obtained in many cases depending on the station assignments involved.

(d) The groundwave signal strength required to render primary service is 2 mV/m for communities with populations of 2,500 or more and 0.5 mV/m for communities with populations of less than 2,500. See §73.184 for curves showing distance to various groundwave field strength contours for different frequencies and ground conductivities, and also see §73.183, "Groundwave signals."

(e) A Class C station may be authorized to operate with a directional antenna during daytime hours providing the power is at least 0.25 kW. In computing the degrees of protection which such antenna will afford, the radiation produced by the directional antenna system will be assumed to be no less, in any direction, than that which would result from non-directional operation using a single element of the directional array, with 0.25 kW.

(f) All classes of broadcast stations have primary service areas subject to limitation by fading and noise, and interference from other stations to the contours set out for each class of station.

(g) Secondary service is provided during nighttime hours in areas where the skywave field strength, 50% or more of the time, is 0.5 mV/m or greater (0.1 mV/m in Alaska). Satisfactory secondary service to cities is not considered possible unless the field strength of the skywave signal approaches or exceeds the value of the groundwave field strength that is required for primary service. Secondary service is subject to some interference and extensive fading whereas the primary service area of a station is subject to no objectionable interference or fading. Only Class A stations are assigned on the basis of rendering secondary service.

Note: Standards have not been established for objectionable fading because of the relationship to receiver characteristics. Selective fading causes audio distortion and signal strength reduction below the noise level, objectionable characteristics inherent in many modern receivers. The AVC circuits in the better designed receivers generally maintain the audio output at a sufficiently constant level to permit satisfactory reception during most fading conditions.

(h) Intermittent service is rendered by the groundwave and begins at the outer boundary of the primary service area and extends to a distance where the signal strength decreases to a value that is too low to provide any service. This may be as low as a few μV/m in certain areas and as high as several millivolts per meter in other areas of high noise level, interference from other stations, or objectionable fading at night. The intermittent service area may vary widely from day to night and generally varies over shorter intervals of time. Only Class A stations are protected from interference from other stations to the intermittent service area.

(i) Broadcast stations are licensed to operate unlimited time, limited time, daytime, share time, and specified hours. (See §73.1710, 73.1725, 73.1720, 73.1715, and 73.1730.) Applications for new stations shall specify unlimited time operation only.

(j) §73.24 sets out the general requirements for modifying the facilities of a licensed station and for establishing a new station. §§73.24(b) and 73.37 include interference related provisions that be considered in cnnection with an application to modify the facilities of an existing station or to establish a new station. §73.30 describes the procedural steps required to receive an authorization to operate in the 1605-1705 kHz band.

(k) Objectionable nighttime interference from a broadcast station occurs when, at a specified field strength contour with respect to the desired station, the field strength of an undesired station (co-channel or first adjacent channel, after application of proper protection ratio) exceeds for 10% or more of the time the values set forth in these standards. The value derived from the root-sum-square of all interference contributions represents the extent of a station's interference-free coverage.

(1) With respect to the root-sum-square (RSS) values of interfering field strengths referred to in this section, calculation of nighttime interference-free service is accomplished by considering the signals on the three channels of concern (co- and first adjacencies) in order of decreasing magnitude, adding the squares of the values and extracting the square root of the sum, excluding those signals which are less than 50% of the RSS values of the higher signals already included.

(2) With respect to the root-sum-square values of interfering field strengths referred to in this section, calculation of nighttime interference for non-coverage purposes is accomplished by considering the signals on the three channels of concern (co- and first adjacencies) in order of decreasing magnitude, adding the squares of the values and extracting the square root of the sum, excluding those signals which are less than 25% of the RSS values of the higher signals already included.

(3) With respect to the root-sum-square values of interfering field strengths referred to in this section, calculation is accomplished by considering the signals on the three channels of concern (co- and first adjacencies) in order of decreasing magnitude, adding the squares of the values and extracting the square root of the sum. The 0% exclusion method applies only to the determination of an improvement factor value for evaluating a station's eligibility for migration to the band 1605-1705 kHz.

(4) The RSS value of the nighttime interference-free contour will not be considered to be increased when a new interfering signal is added which is less than 50% of the RSS value of the interference from existing stations, and which at the same time is not greater than the smallest signal included in the RSS value of interference from existing stations.

(5) It is recognized that application of the above "50% exclusion" method (or any exclusion method using a per cent value greater than zero) of calculating the RSS interference may result

in some cases in anomalies wherein the addition of a new interfering signal or the increase in value of an existing interfering signal will cause the exclusion of a previously included signal and may cause a decrease in the calculated RSS value of interference. In order to provide the Commission with more realistic information regarding gains and losses in service (as a basis for determination of the relative merits of a proposed operation) the following alternate method for calculating the proposed RSS values of interference will be employed wherever applicable.

(6) In the cases where it is proposed to add a new interfering signal which is not less than 50% (or 25%, depending on which study is being performed) of the RSS value of interference from existing stations or which is greater that the smallest signal already included to obtain this RSS value, the RSS limitation after addition of the new signal shall be calculated without excluding any signal previously included. Similarly, in cases where it is proposed to increase the value of one of the existing interfering signals which has been included in the RSS value, the RSS limitation after the increase shall be calculated without excluding the interference from any source previously included.

(7) If the new or increased signal proposed in such cases is ultimately authorized, the RSS values of interference to other stations affected will thereafter be calculated by the "50% exclusion" (or 25% exclusion, depending on the which study is being performed) method without regard to this alternate method of calculation.

(8) Examples of RSS interference calculations:

(i) Existing interferences:

Station No. 1 - 1.00 mV/m.
Station No. 2 - 0.60 mV/m.
Station No. 3 - 0.59 mV/m.
Station No. 4 - 0.58 mV/m.

The RSS value from Nos. 1, 2 and 3 is 1.31 mV/m; therefore interference from No. 4 is excluded for it is less than 50% of 1.31 mV/m.

(ii) Station A receives interference from:

Station No. 1 - 1.00 mV/m.
Station No. 2 - 0.60 mV/m.
Station No. 3 - 0.59 mV/m.

It is proposed to add a new limitation, 0.68 mV/m. This is more than 50% of 1.31 mV/m, the RSS value of Nos. 1, 2 and 3. The RSS value of Station No. 1 and of the proposed station would be 1.21 mV/m which is more than twice as large as the limitation from Station No. 2 or No. 3. However, under the above provision the new signal and the three existing interferences are nevertheless calculated for purposes of comparative studies, resulting in an RSS value of 1.47

mV/m. However, if the proposed station is ultimately authorized, only No. 1 and the new signal are included in all subsequent calculations for the reason that Nos. 2 and 3 are less than 50% of 1.21 mV/m, the RSS value of the new signal and No. 1.

(iii) Station A receives interference from:

Station No. 1 - 1.00 mV/m.
Station No. 2 - 0.60 mV/m.
Station No. 3 - 0.59 mV/m.

No. 1 proposes to increase the limitation it imposes on Station A to 1.21 mV/m. Although the limitations from stations Nos. 2 and 3 are less than 50% of the 1.21 mV/m limitation, under the above provision they are nevertheless included for comparative studies, and the RSS limitation is calculated to be 1.47 mV/m. However, if the increase proposed by Station No. 1 is authorized, the RSS value then calculated is 1.21 mV/m because Stations Nos. 2 and 3 are excluded in view of the fact that the limitations they impose are less than 50% of 1.21 mV/m.

Note: The principles demonstrated in the previous examples for the calculation of the 50% exclusion method also apply to calculations using the 25% exclusion method after appropriate adjustment.

(l) Objectionable nighttime interference from a station shall be considered to exist to a station when, at the field strength contour specified in paragraph (q) of this section with respect to the class to which the station belongs, the field strength of an interfering station operating on the same channel or on a first adjacent channel after signal adjustment using the proper protection ratio, exceeds for 10% or more of the time the value of the permissible interfering signal set forth opposite such class in paragraph (q) of this section.

(m) For the purpose of estimating the coverage and the interfering effects of stations in the absence of field strength measurements, use shall be made of Figure 8 of §73.190, which describes the estimated effective field (for 1 kW power input) of simple vertical omnidirectional antennas of various heights with ground systems having at least 120 quarter-wavelength radials. Certain approximations, based on the curve or other appropriate theory, may be made when other than such antennas and ground systems are employed, but in any event the effective field to be employed shall not be less than the following:

Class of Station	Effective Field (at 1 km)
All Class A (except Alaskan) Class A (Alaskan), B and D Class C	362 mV/m 282 mV/m 241 mV/m
Note (1): When a directional antenna is employed, the radiated signal of a broadcasting station will vary in strength in different directions, possibly being greater than the above values in certain directions and less in other directions depending upon the design and adjustment of the directional antenna system. To determine the interference in any direction, the measured or calculated radiated field (unattenuated field strength at 1 kilometer from the array) must be used in conjunction with the appropriate propagation curves. (See §73.185 for further discussion and solution of a typical directional antenna case.) Note (2): For Class B stations in Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands, 241 mV/m shall be used.	

(n) The existence or absence of objectionable groundwave interference from stations on the same or adjacent channels shall be determined by actual measurements made in accordance with the method described in §73.186, or in the absence of such measurements, by reference to the propagation curves of §73.184. The existence or absence of objectionable interference due to skywave propagation shall be determined by reference to Formula 2 in §73.190.

(o) Computation of Skywave Field Strength Values:

(1) Fifty Percent Skywave Field Strength Values (Clear Channel). In computing the fifty percent skywave field strength values of a Class A clear channel station, use shall be made of Formula 1 of §73.190, entitled "Skywave Field Strength" for 50 percent of the time.

(2) Ten Percent Skywave Field Strength Values. In computing the 10% skywave field strength for stations on a single signal or an RSS basis, Formula 2 in §73.190 shall be used.

(3) Determination of Angles of Departure. In calculating skywave field strength for stations on all channels, the pertinent vertical angle shall be determined by use of the formula in §73.190(d).

(p) The distance to any specified groundwave field strength contour for any frequency may be determined from the appropriate curves in §73.184 entitled "Ground Wave Field Strength vs. Distance."

(q) Normally protected service contours and permissible interference signals for broadcast stations are as follows (for Class A stations, see also paragraph (a) of this section):

Class of Station	Class of Channel Used	Signal Strength Contour of Area Protected from Objectionable Interference 1/ (μV/m)		Permissible Interfering Signal (μV/m)	
		Day 2/	Night	Day 2/	Night 3/
A	Clear	SC 100 AC 500	SC 500 50% SW AC 500 GW	SC 5 AC 250	SC 25 AC 250
A (Alaskan)	do	SC 100 AC 500	SC 100 50% SW AC 500 GW	SC 5 AC 250	SC 5 AC 250
B	Clear Regional	500	2000 2/	25 AC 250	25 250
C	Local	500	Not presc. 4/	SC 25	Not presc.
D	Clear Regional	500	Not presc.	SC 25 AC 250	Not presc.

1/ When a station is already limited by interference from other stations to a contour of higher value than that normally protected for its class, this higher value contour shall be the established protection standard for such station. Changes proposed by Class A and B stations shall be required to comply with the following restrictions. Those interferers that contribute to another station's RSS using the 50% exclusion method are required to reduce their contribution to that RSS by 10%. Those lesser interferers that contribute to a station's RSS using the 25% exclusion method but do not contribute to that station's RSS using the 50% exclusion method may make changes not to exceed their present contribution. Interferers not included in a station's RSS using the 25% exclusion method are permitted to increase radiation as long as the 25% exclusion threshold is not equalled or exceeded. In no case will a reduction be required that would result in a contributing value that is below the pertinent value specified in the table.

2/ Groundwave.

3/ Skywave field strength for 10 percent or more of the time.

4/ During nighttime hours, Class C stations in the contiguous 48 States may treat all Class B stations assigned to 1230, 1240, 1340, 1400, 1450 and 1490 kHz in Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands as if they were Class C stations.

Note: SC = Same channel; AC = Adjacent channel; SW = Skywave; GW = Groundwave

(r) The following table of logarithmic expressions is to be used as required for determining the minimum permissible ratio of the field strength of a desired to an undesired signal. This table shall be used in conjunction with the protected contours specified in paragraph (q).

Frequency Separation of Desired to Undesired Signals (kHz)	Desired Groundwave to:		Desired 50% Skywave to Undesired 10% Skywave (dB)
	Undesired Groundwave (dB)	Undesired 10% Skywave (dB)	
0	26	26	26
10	6	6	not presc.

(s) Two stations, one with a frequency twice that of the other, should not be assigned in the same groundwave service area unless special precautions are taken to avoid interference from the second harmonic of the station operating on the lower frequency. Additionally, in selecting a frequency, consideration should be given to the fact that occasionally the frequency assignment of two stations in the same area may bear such a relation to the intermediate frequency of some broadcast receivers as to cause "image" interference. However, since this can usually be rectified by readjustment of the intermediate frequency of such receivers, the Commission, in general, will not take this kind of interference into consideration when authorizing stations.

(t) The groundwave service of two stations operating with synchronized carriers and broadcasting identical programs will be subject to some distortion in areas where the signals from the two stations are of comparable strength. For the purpose of estimating coverage of such stations, areas in which the signal ratio is between 1:2 and 2:1 will not be considered as receiving satisfactory service.

Note: Two stations are considered to be operated synchronously when the carriers are maintained within 0.2 Hz of each other and they transmit identical programs.

28. Section 73.183 is amended by removing paragraph (b) and adding the note that follows paragraph (a), and by redesignating paragraphs (c) through (f) as (b) through (e), and revising new paragraphs (c) and (e) to read as follows:

§73.183 Groundwave signals.

(a) * * *

Note: Groundwave field strength measurements will not be accepted or considered for the purpose of establishing that interference to a station in a foreign country other than Canada, or that the field strength at the border thereof, would be less than indicated by the use of the ground

conductivity maps and engineering standards contained in this part and applicable international agreements. Satisfactory groundwave measurements offered for the purpose of demonstrating values of conductivity other than those shown by Figure M3 in problems involving protection of Canadian stations will be considered only if, after review thereof, the appropriate agency of the Canadian government notifies the Commission that they are acceptable for such purpose.

* * * * *

(c) Example of determining interference by the graphs in §73.184:

It is desired to determine whether objectionable interference exists between a proposed 5 kW Class B station on 990 kHz and an existing 1 kW Class B station on first adjacent channel, 1000 kHz. The distance between the two stations is 260 kilometers and both stations operate nondirectionally with antenna systems that produce a horizontal effective field of 282 mV/m at one kilometer. (See §73.185 regarding of use of directional antennas.) The ground conductivity at the site of each station and along the intervening terrain is 6 mS/m. The protection to Class B stations during daytime is to the 500 μV/m (0.5 mVm) contour using a 6 dB protection factor. The distance to the 500 μV/m groundwave contour of the 1 kW station is determined by the use of the appropriate curve in §73.184. Since the curve is plotted for 100 mV/m at a 1 kilometer, to find the distance to the 0.5 mV/m contour of the 1 kw station, it is necessary to determine the distance to the 0.1773 m/Vm contour.

$$(100 \text{ X } 0.5/282 = 0.1773)$$

Using the 6 mS/m curve, the estimated radius of the 0.5 mV/m contour is 62.5 kilometers. Subtracting this distance from the distance between the two stations leaves 197.5 kilometers. Using the same propagation curve, the signal from the 5 kW station at this distance is seen to be 0.059 mV/m. Since a protection ratio of 6 dB, desired to undesired signal, applies to stations separated by 10 kHz, the undesired signal could have had a value of up to 0.25 mV/m without causing objectionable interference. For co-channel studies, a desired to undesired signal ratio of no less than 20:1 (26 dB) is required to avoid causing objectionable interference.

(d) * * *

(e) Example of the use of the equivalent distance method:

It is desired to determine the distance to the 0.5 mV/m and 0.025 mV/m contours of a station on a frequency of 1000 kHz with an inverse distance field of 100 mV/m at one kilometer being radiated over a path having a conductivity of 10 mS/m for a distance of 20 kilometers, 5 mS/m for the next 30 kilometers and 15 mSm/m thereafter. Using the appropriate curve in §73.184, Graph 12, at a distance of 20 kilometers on the curve for 10 mS/m, the field strength is found to be 2.84 mV/m. On the 5mS/m curve, the equivalent distance to this field strength is 14.92 kilometers, which is 5.08 (20 - 14.92) kilometers nearer to the transmitter. Continuing on the propagation curve, the distance to a field strength of 0.5 mV/m is found to be 36.11 kilometers.

The actual length of the path travelled, however, is 41.19 (36.11 + 5.08) kilometers. Continuing on this propagation curve to the conductivity change at 44.92 (50.00 - 5.08) kilometers, the field strength is found to be 0.304 mV/m. On the 15 mS/m propagation curve, the equivalent distance to this field strength is 82.94 kilometers, which changes the effective path length by 38.02 (82.94 - 44.92) kilometers. Continuing on this propagation curve, the distance to a field strength of 0.025 mV/m is seen to be 224.4 kilometers. The actual length of the path travelled, however, is 191.46 (224.4 + 5.08 - 38.02) kilometers.

29. Section 73.184 is amended by revising paragraph (a) and the note following paragraph (b), removing paragraph (c), and revising and redesignating paragraphs (d), (e), and (f) as (c), (d), and (e), to read as follows:

§73.184 Groundwave field strength charts.

(a) Graphs 1 to 20 show, for each of 20 frequencies, the computed values of groundwave field strength as a function of groundwave conductivity and distance from the source of radiation. The groundwave field strength is considered to be that part of the vertical component of the electric field which has not been reflected from the ionosphere nor from the troposphere. These 20 families of curves are plotted on log-log graph paper and each is to be used for the range of frequencies shown thereon. Computations are based on a dielectric constant of the ground (referred to air as unity) equal to 15 for land and 80 for sea water and for the ground conductivities (expressed in mS/m) given on the curves. The curves show the variation of the groundwave field strength with distance to be expected for transmission from a vertical antenna at the surface of a uniformly conducting spherical earth with the groundwave constants shown on the curves. The curves are for an antenna power of such efficiency and current distribution that the inverse distance (unattenuated) field is 100 mV/m at 1 kilometer. The curves are valid for distances that are large compared to the dimensions of the antenna for other than short vertical antennas.

(b) * * *

NOTE: The computed values of field strength versus distance used to plot Graphs 1 to 20 are available in tabular form. For information on obtaining copies of these tabulations call or write the Consumer Affairs Office, Federal Communications Commission, Washington, D.C. 20554, (202) 632-7000.

(c) Provided the value of the dielectric constant is near 15, the ground conductivity curves of Graphs 1 to 20 may be compared with actual field strenght measurement data to determine the appropriate values of the ground conductivity and the inverse distance field strength at 1 kilometer. This is accomplished by plotting the measured field strengths on transparent log-log graph paper similar to that used for Graphs 1 to 20 and superimposing the plotted graph over the Graph corresponding to the frequency of the station measured. The plotted graph is then shifted vertically until the plotted measurement data is best aligned with one of the conductivity curves on the Graph; the intersection of the inverse distance line on the Graph with the 1 kilometer

abscissa on the plotted graph determines the inverse distance field strength at 1 kilometer. For other values of dielectric constant, the following procedure may be used to determine the dielectric constant of the ground, the ground conductivity and the inverse distance field strength at 1 kilometer. Graph 21 gives the relative values of groundwave field strength over a plane earth as a function of the numerical distance p and phase angle b. On graph paper with coordinates similar to those of Graph 21, plot the measured values of field strength as ordinates versus the corresponding distances from the antenna in kilometers as abscissae. The data should be plotted only for distances greater than one wavelength (or, when this is greater, five times the vertical height of the antenna in the case of a nondirectional antenna or 10 times the spacing between the elements of a directional antenna) and for distances less than $80f^{1/3}$/MHz kilometers (i.e., 80 kilometers at 1 MHz). Then, using a light box, place the plotted graph over Graph 21 and shift the plotted graph vertically and horizontally (making sure that the vertical lines on both sheets are parallel) until the best fit with the data is obtained with one of the curves on Graph 21. When the two sheets are properly lined up, the value of the field strength corresponding to the intersection of the inverse distance line of Graph 21 with the 1 kilometer abscissa on the data sheet is the inverse distance field strength at 1 kilometer, and the values of the numerical distance at 1 kilometer, p_1, and of b are also determined. Knowing the values of b and p_1 (the numerical distance at one kilometer), we may substitute in the following approximate values of the ground conductivity and dielectric constant.

$$\chi = \frac{\pi}{p} \cdot \left(\frac{R}{\lambda}\right)_1 \cdot \cos b \qquad \text{(Eq. 1)}$$

$(R/\lambda)_1$ = Number of wavelengths in 1 kilometer,

* * *

f_{MHz} = frequency expressed in megahertz,

$$\varepsilon = \chi \tan b - 1 \qquad \text{(Eq. 3)}$$

ε = dielectric constant of the ground referred to air as unity.

First solve for χ by substituting the known values of p_1, $(R/\lambda)_1$, and cos b in equation (1). Equation (2) may then be solved for δ and equation (3) for ε. At distances greater than $80/f^{1/3}$ MHz kilometers the curves of Graph 21 do not give the correct relative values of field strength since the curvature of the earth weakens the field more rapidly than these plane earth curves would indicate. Thus, no attempt should be made to fit experimental data to these curves at the larger distances.

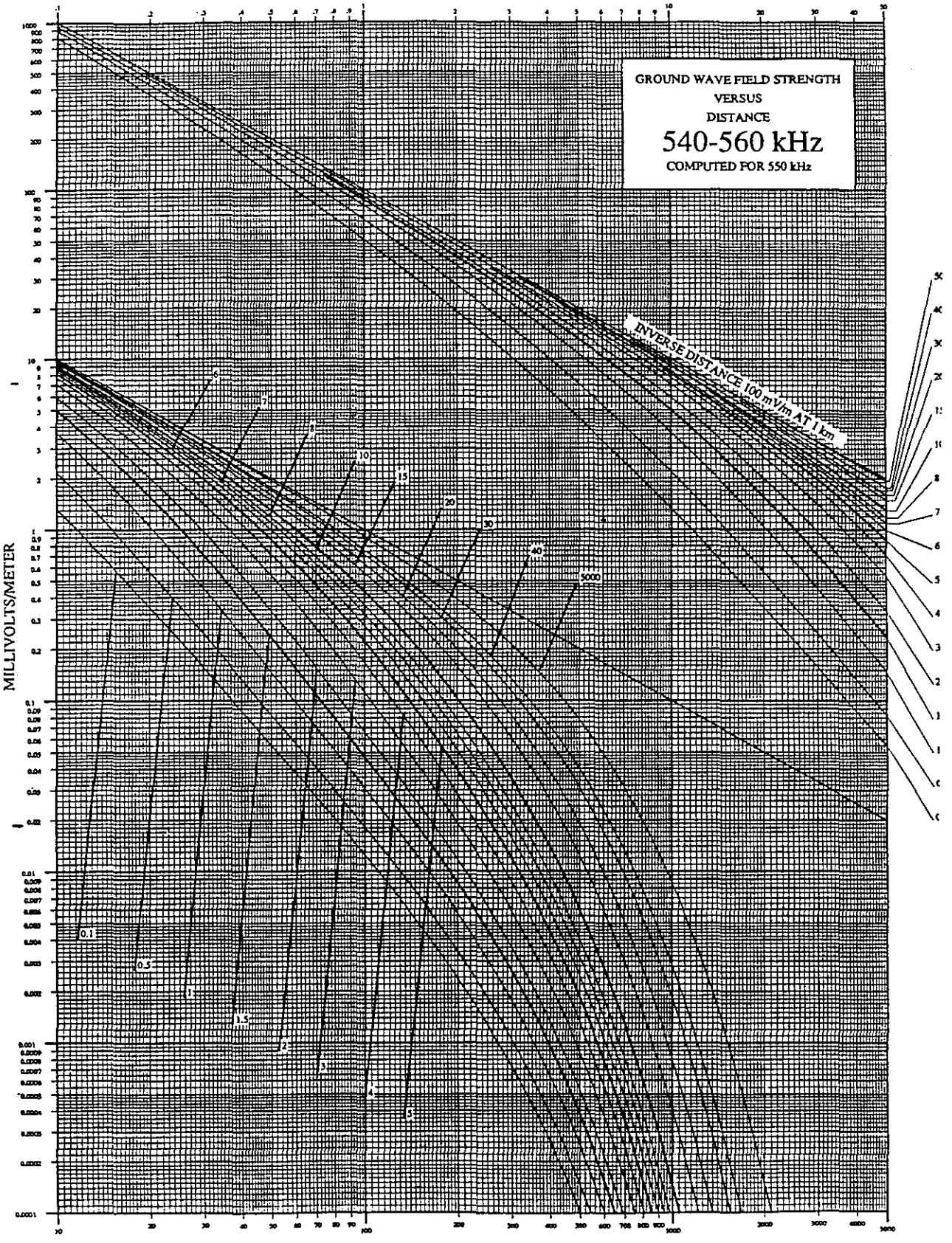
NOTE: For other values of dielectric constant, use can be made of the computer program which was employed by the FCC in generating the curves in Graphs 1 to 20. For information on obtaining a printout of this program, call or write the Consumer Affairs Office, Federal Communications Commission, Washington, D.C. 200554, (202) 632-7000.

(d) At sufficiently short distances (less than 55 kilometers at AM broadcast frequencies), such that the curvature of the earth does not introduce an additional attenuation of the waves, the curves of Graph 21 may be used to determine the groundwave field strength of transmitting and receiving antennas at the surface of the earth for any radiated power, frequency, or set of ground constants. First, trace the straight inverse distance line corresponding to the power radiated on transparent log-log graph paper similar to that of Graph 21, labelling the ordinates of the chart in terms of field strength, and the abscissae in terms of distance. Next, using the formulas given on Graph 21, calculate the value of the numerical distance, p, at 1 kilometer, and the value of b. Then superimpose the log-log graph paper over Graph 21, shifting it vertically until both inverse distance lines coincide and shifting it horizontally until the numerical distance at 1 kilometer on Graph 21 coincides with 1 kilometer on the log-log graph paper. The curve of Graph 21 corresponding to the calculated value of b is then traced on the log-log graph paper giving the field strength versus distance in kilometers.

(e) This paragraph consists of the following Graphs 1 to 20 and 21.

Note: The referenced graphs are not published in the CFR, nor will they be included in the Commission's automated rules system. For information on obtaining copies of the graphs call or write the Consumer Affairs Office, Federal Communications Commission, Washington, D.C. 20554, Telephone: (202) 632-7000.

KILOMETERS FROM ANTENNA



GRAPH 1

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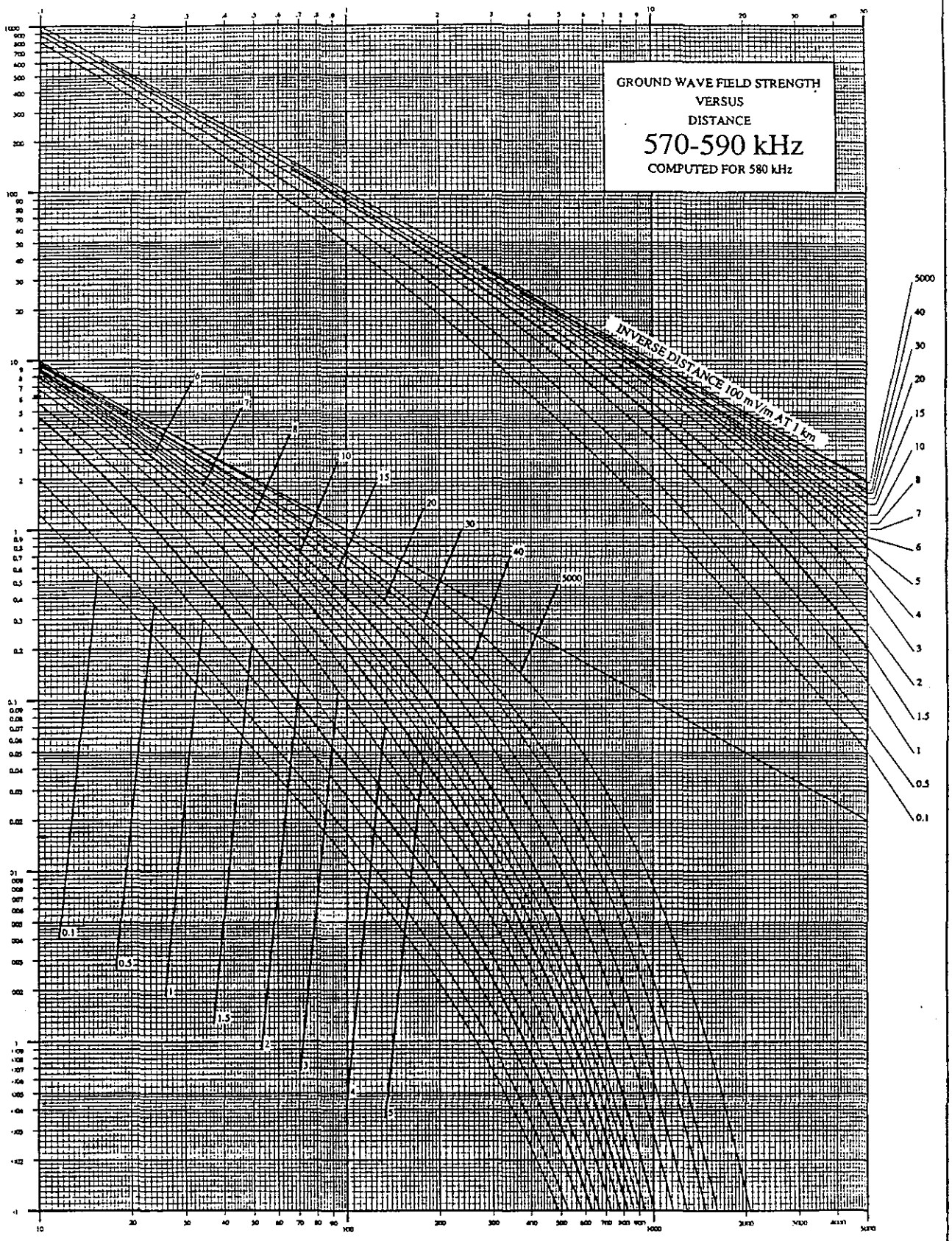

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GRAPH 2

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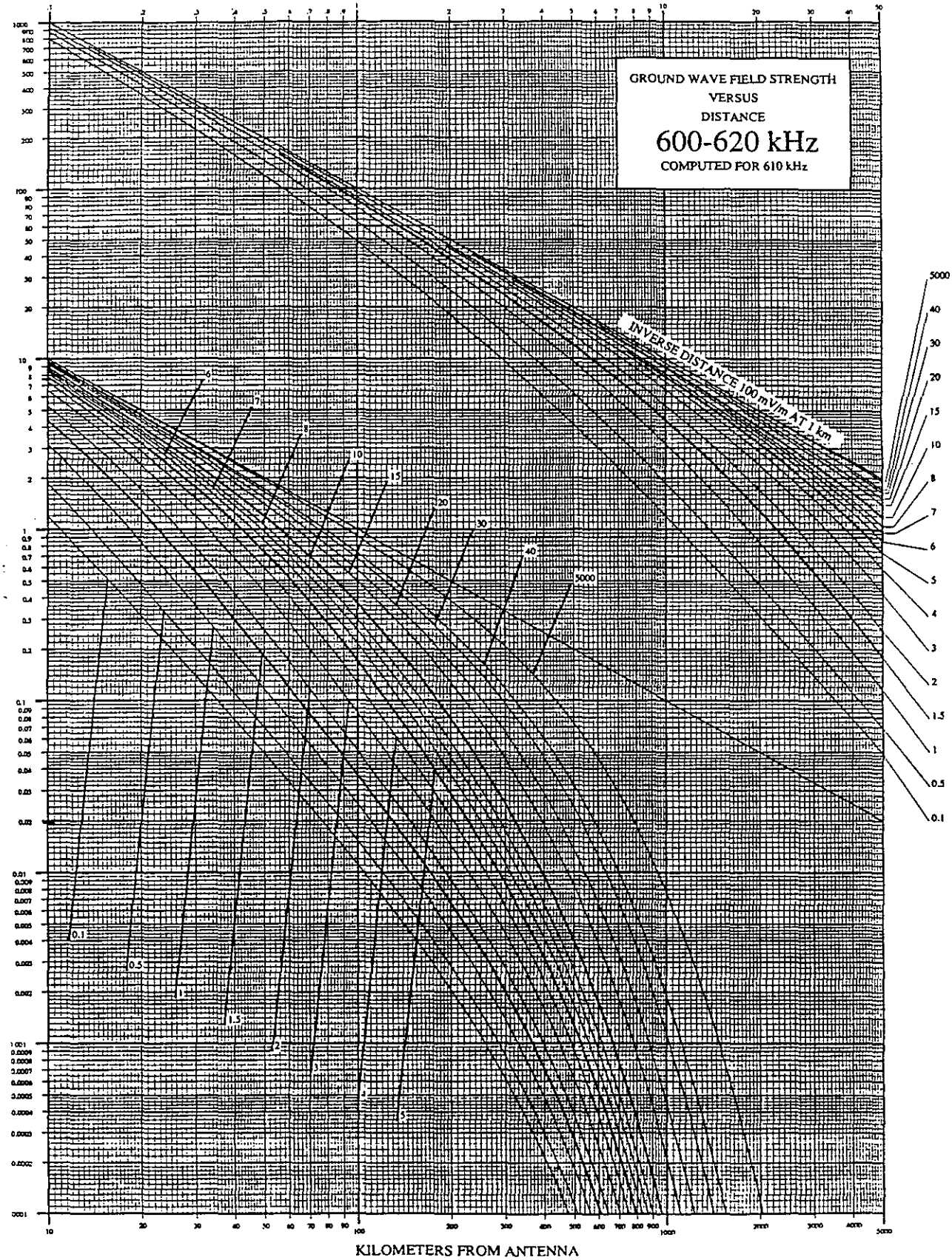

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GRAPH 3

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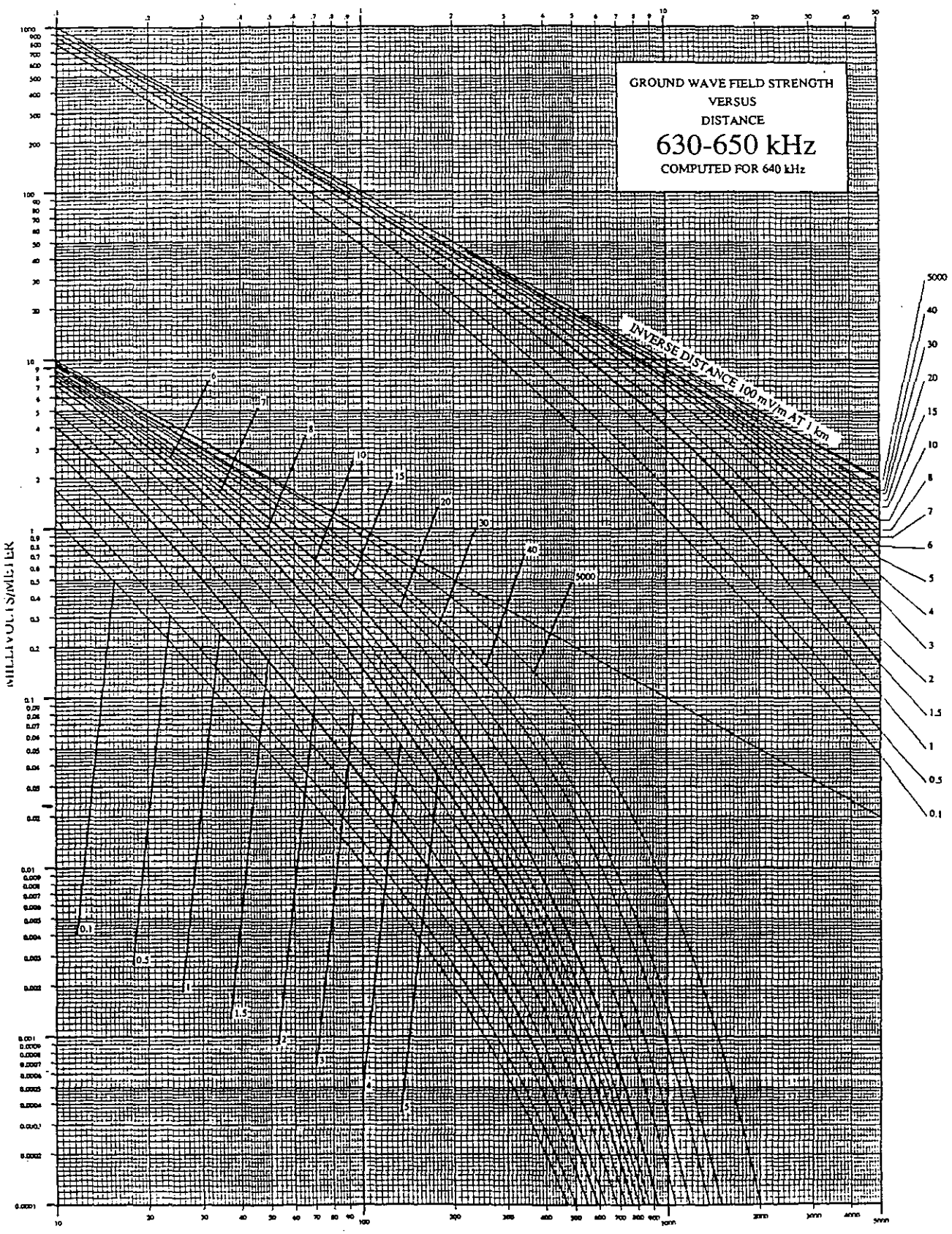

GRAPH 4

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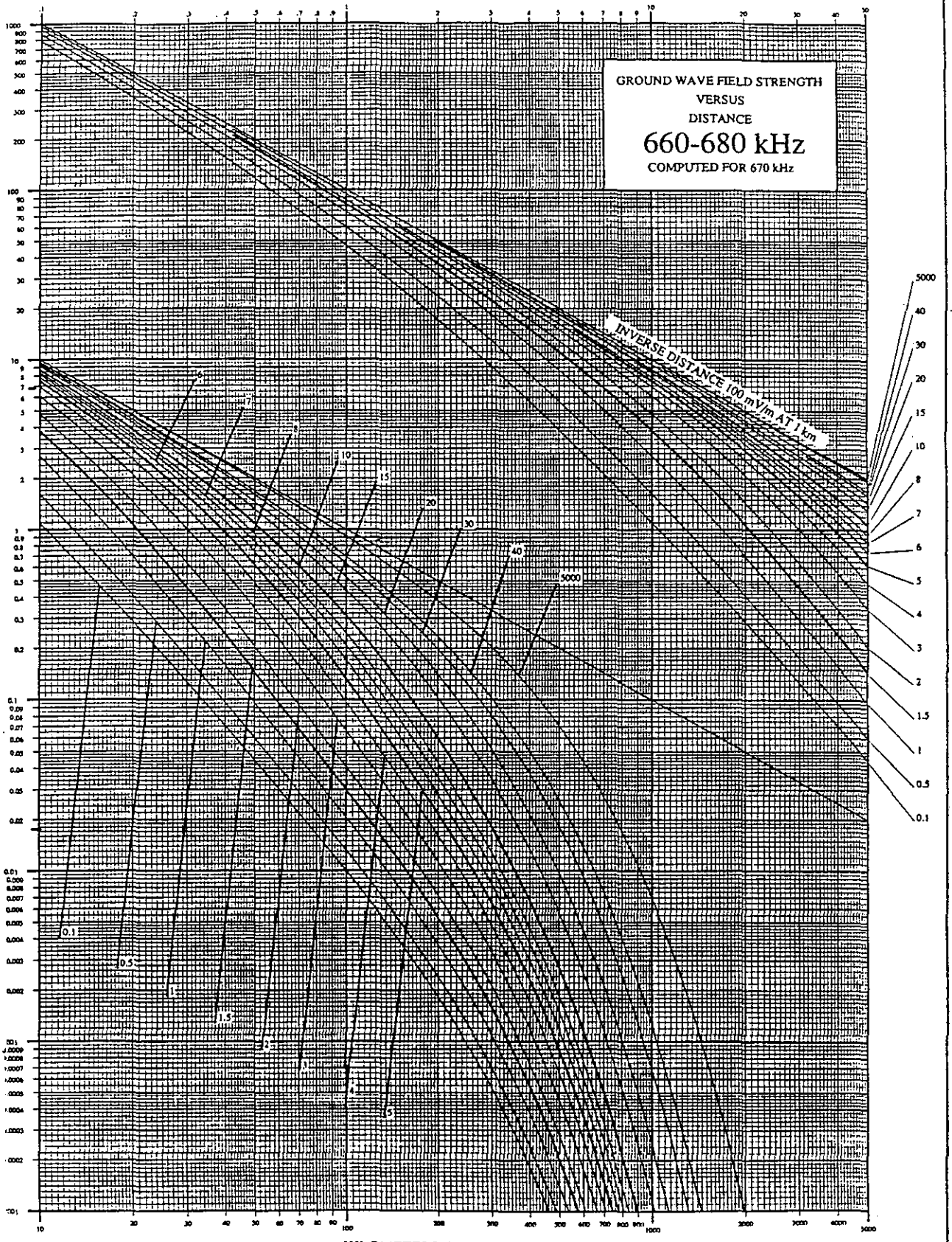

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GRAPH 5

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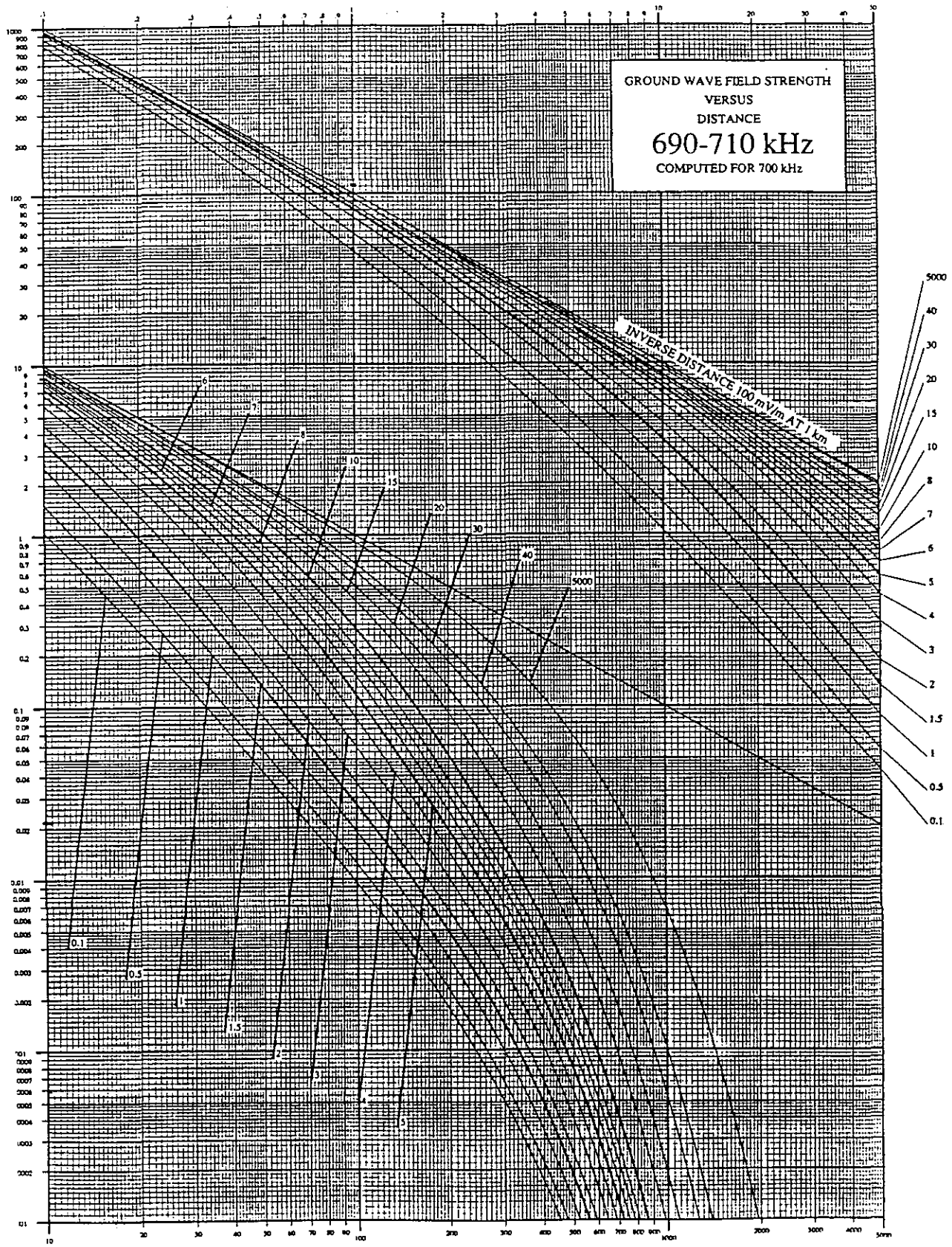

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GRAPH 6

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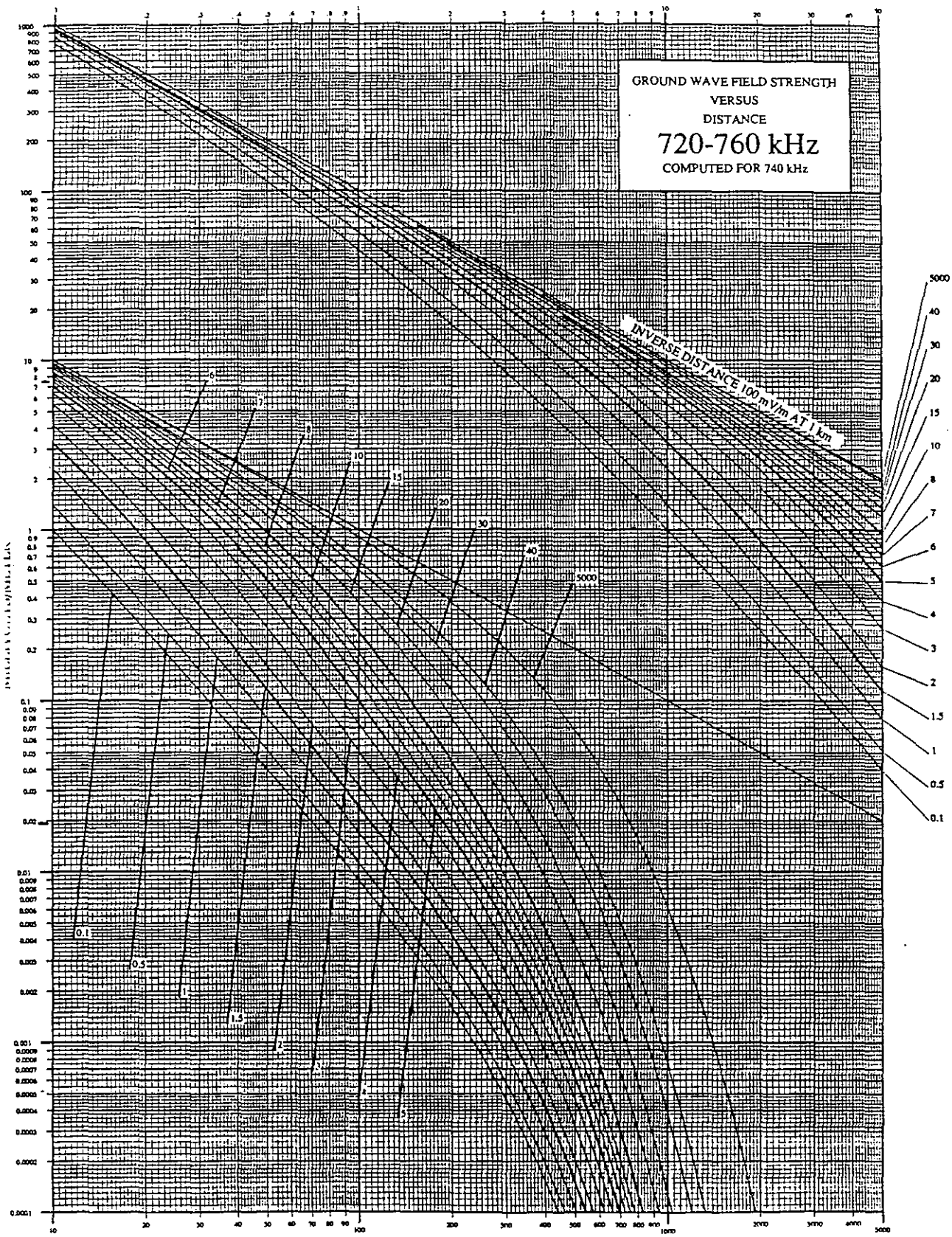

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GRAPH 7

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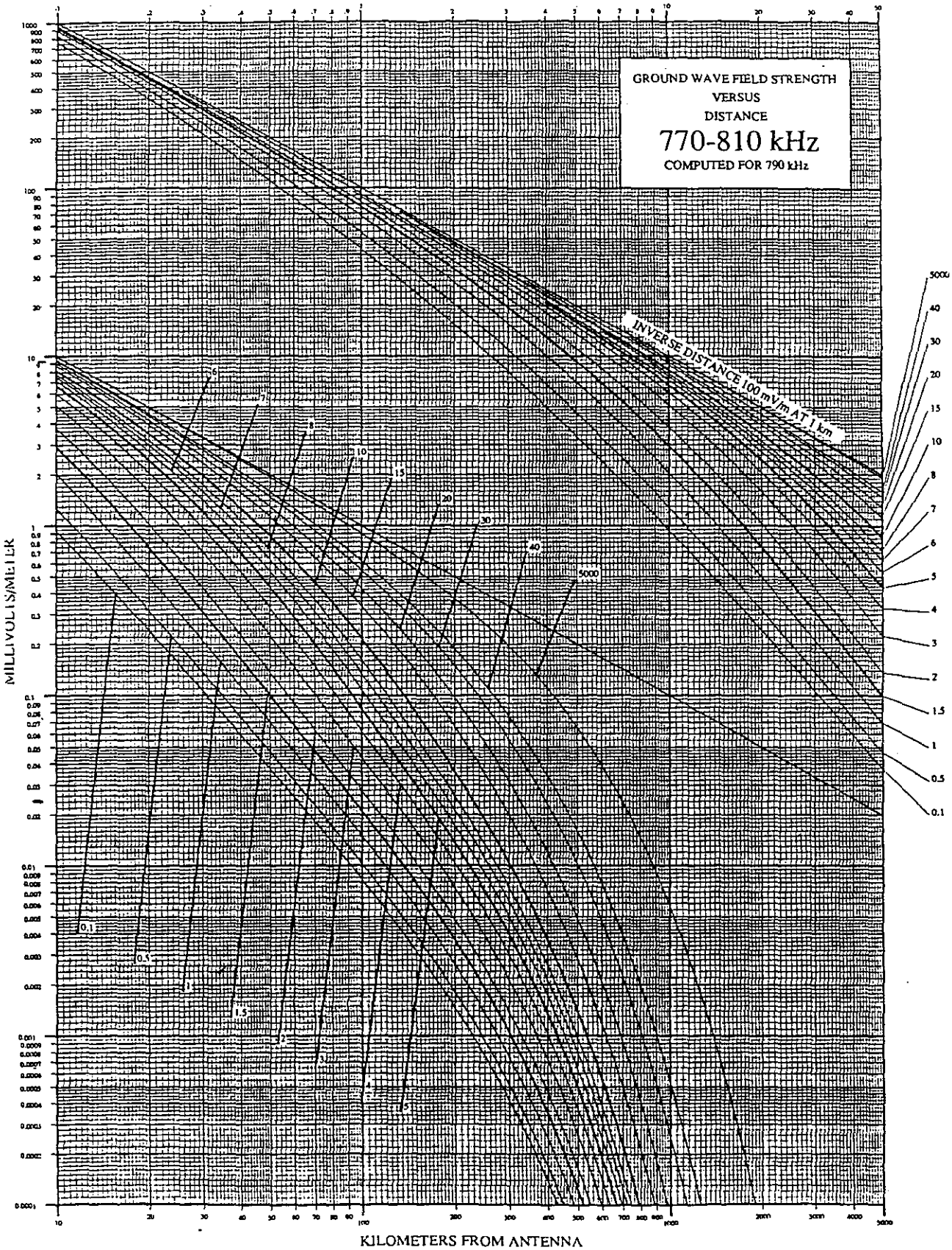

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GRAPH 8

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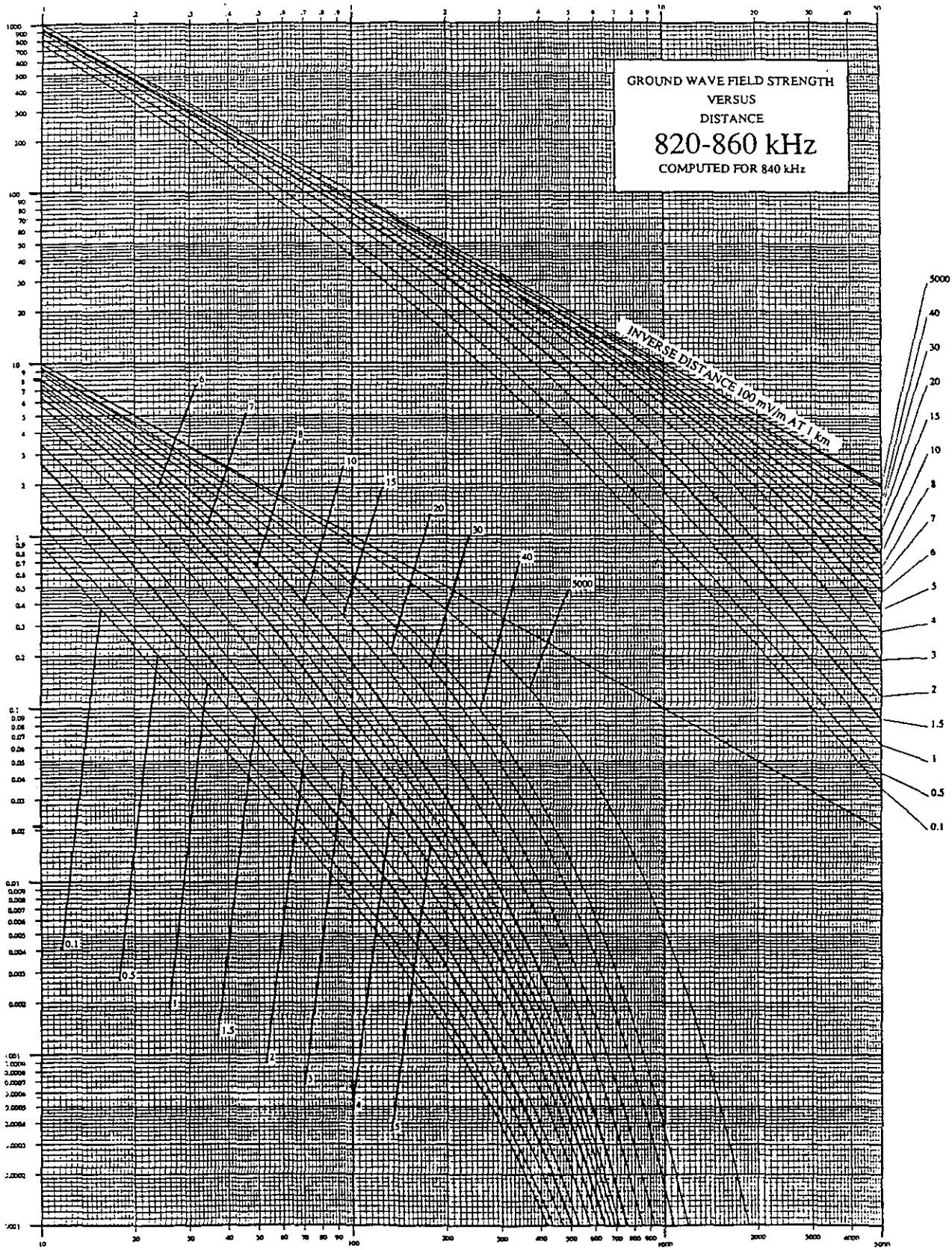

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GRAPH 9

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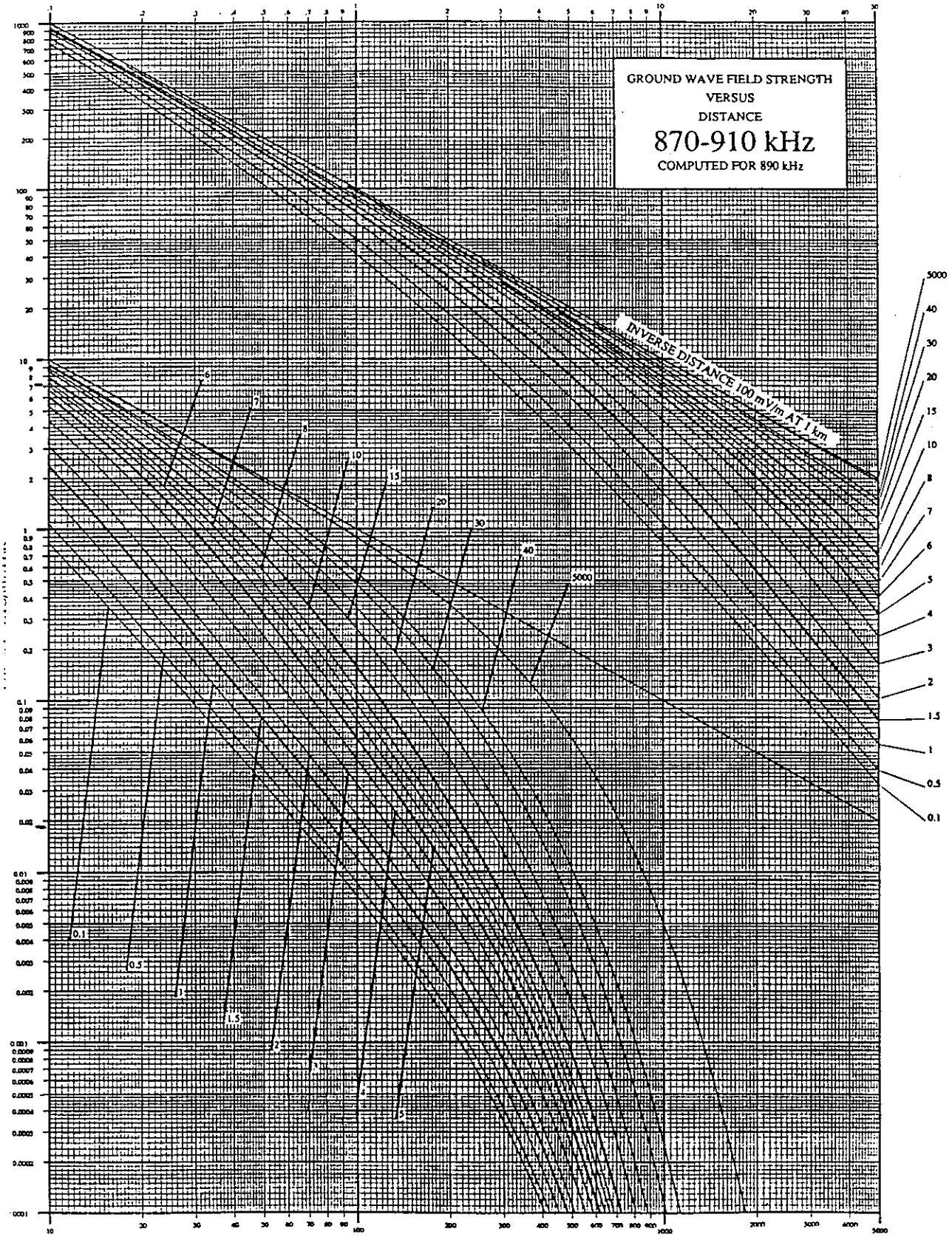

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GRAPH 10

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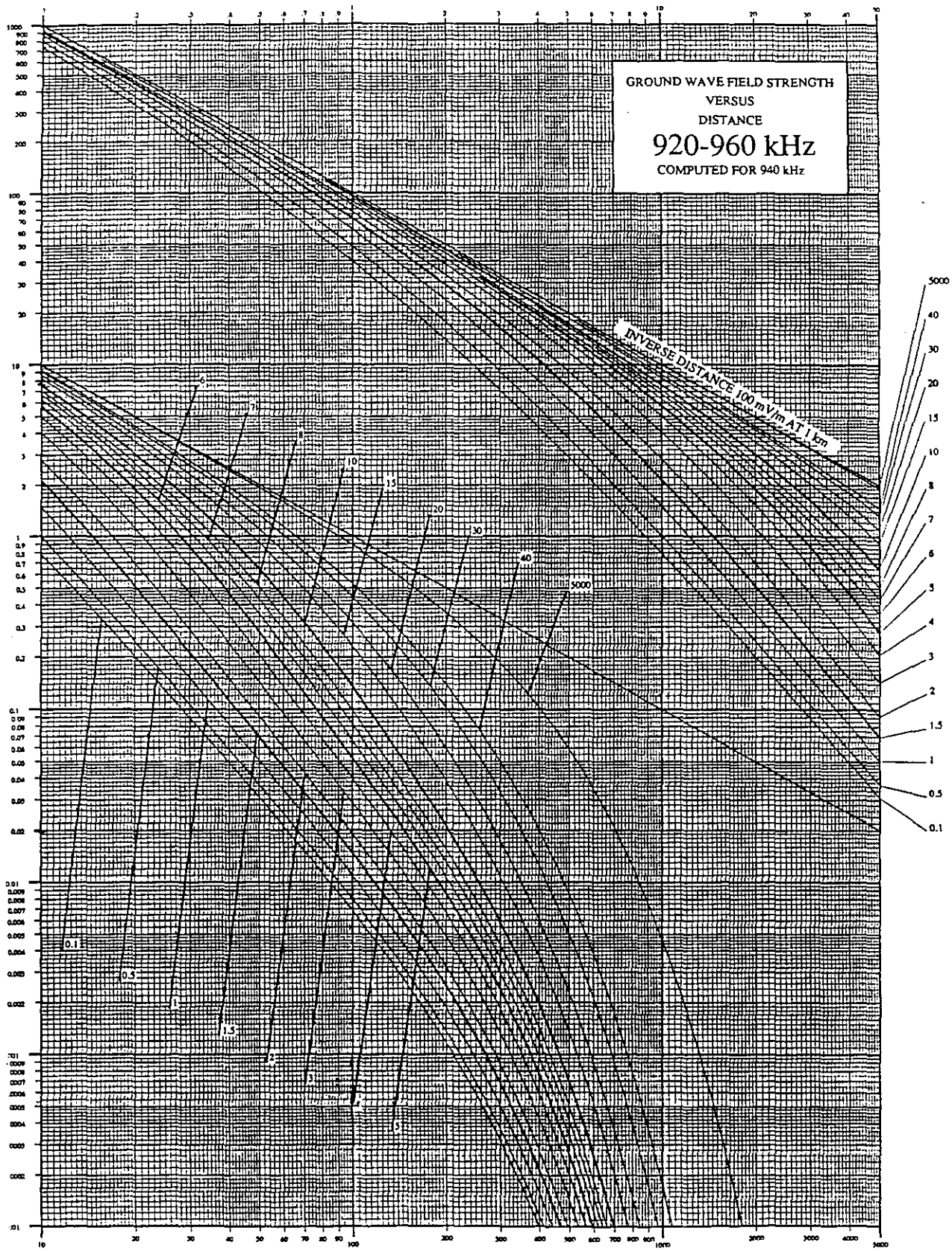

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GRAPH 11

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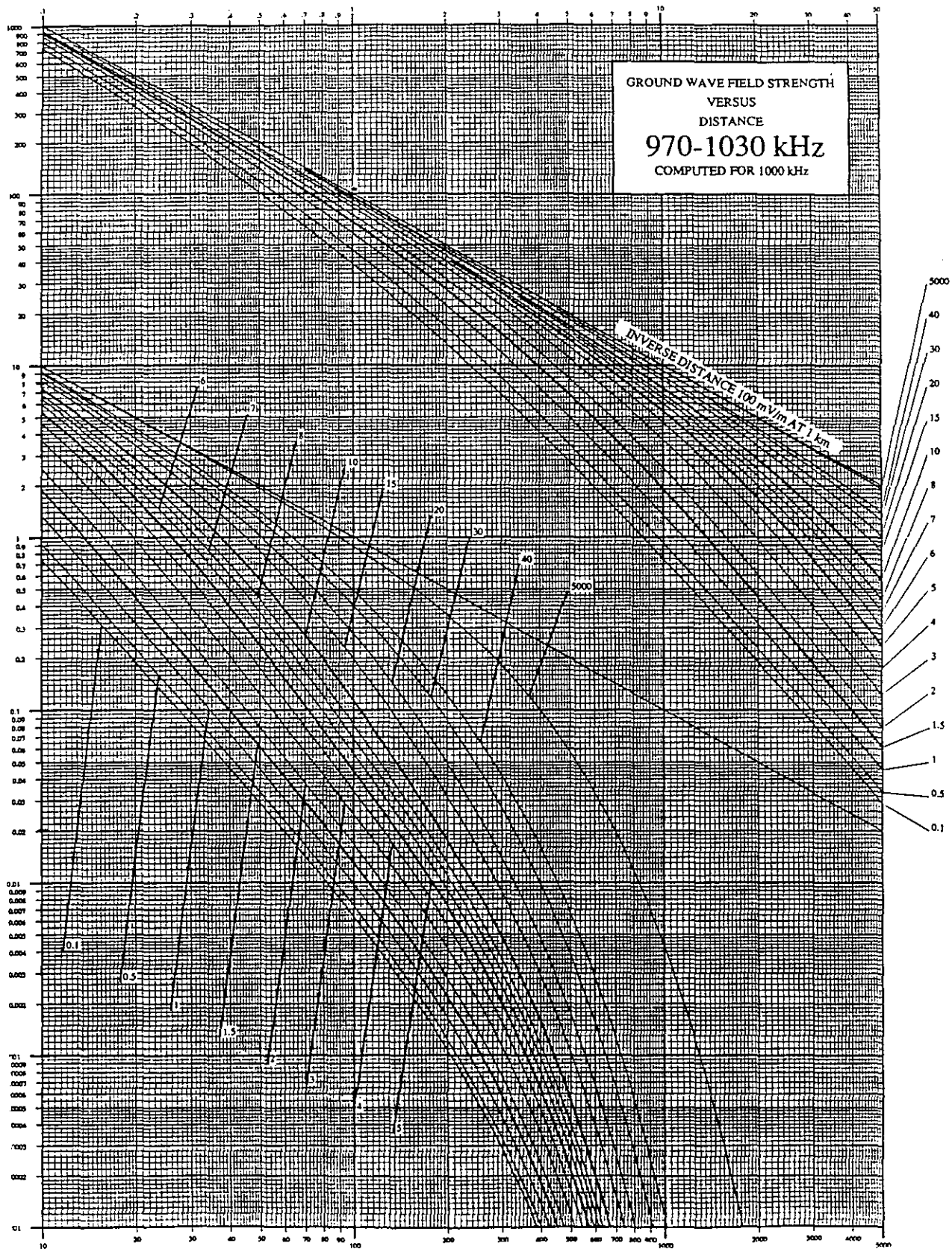

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GRAPH 12

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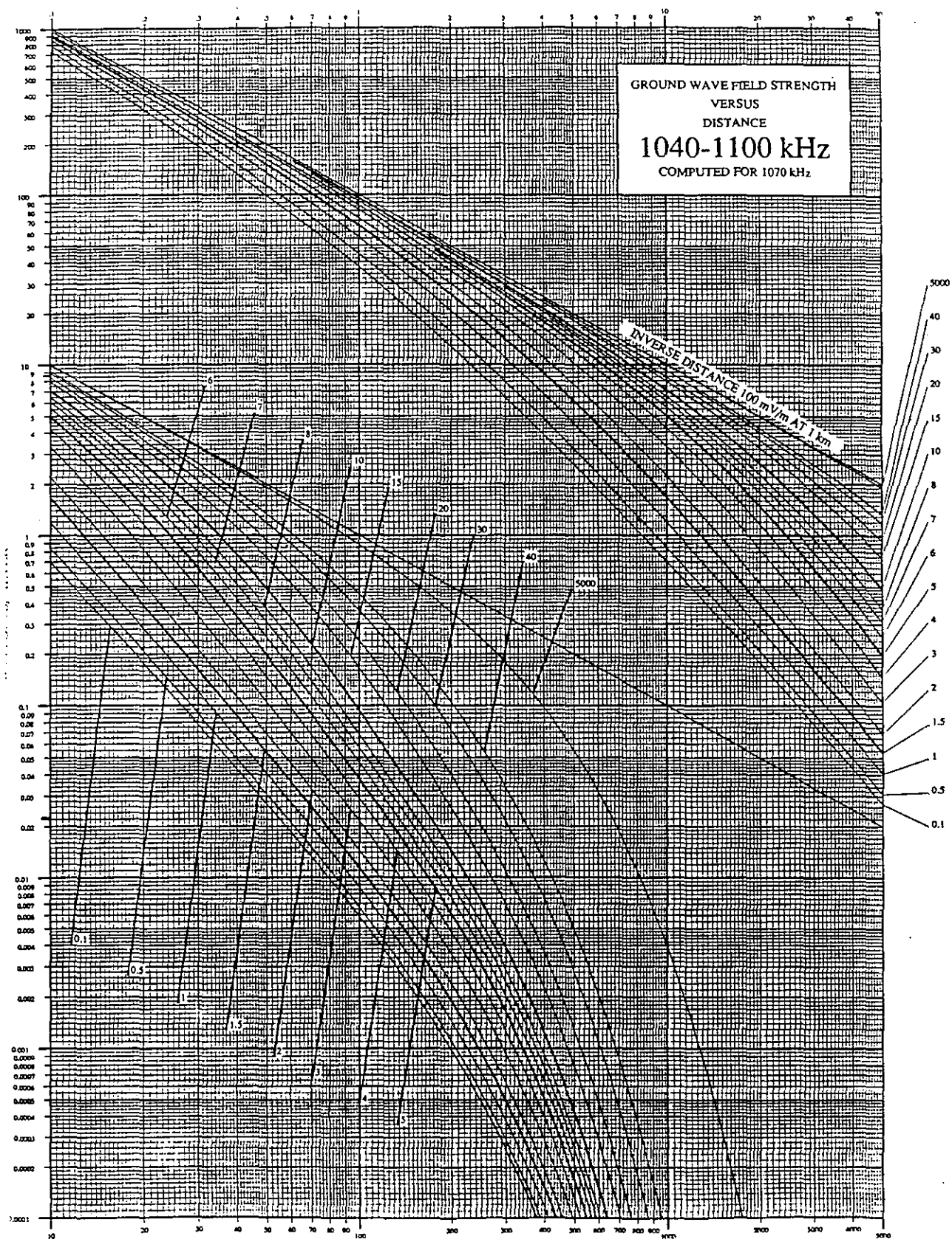

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GRAPH 13

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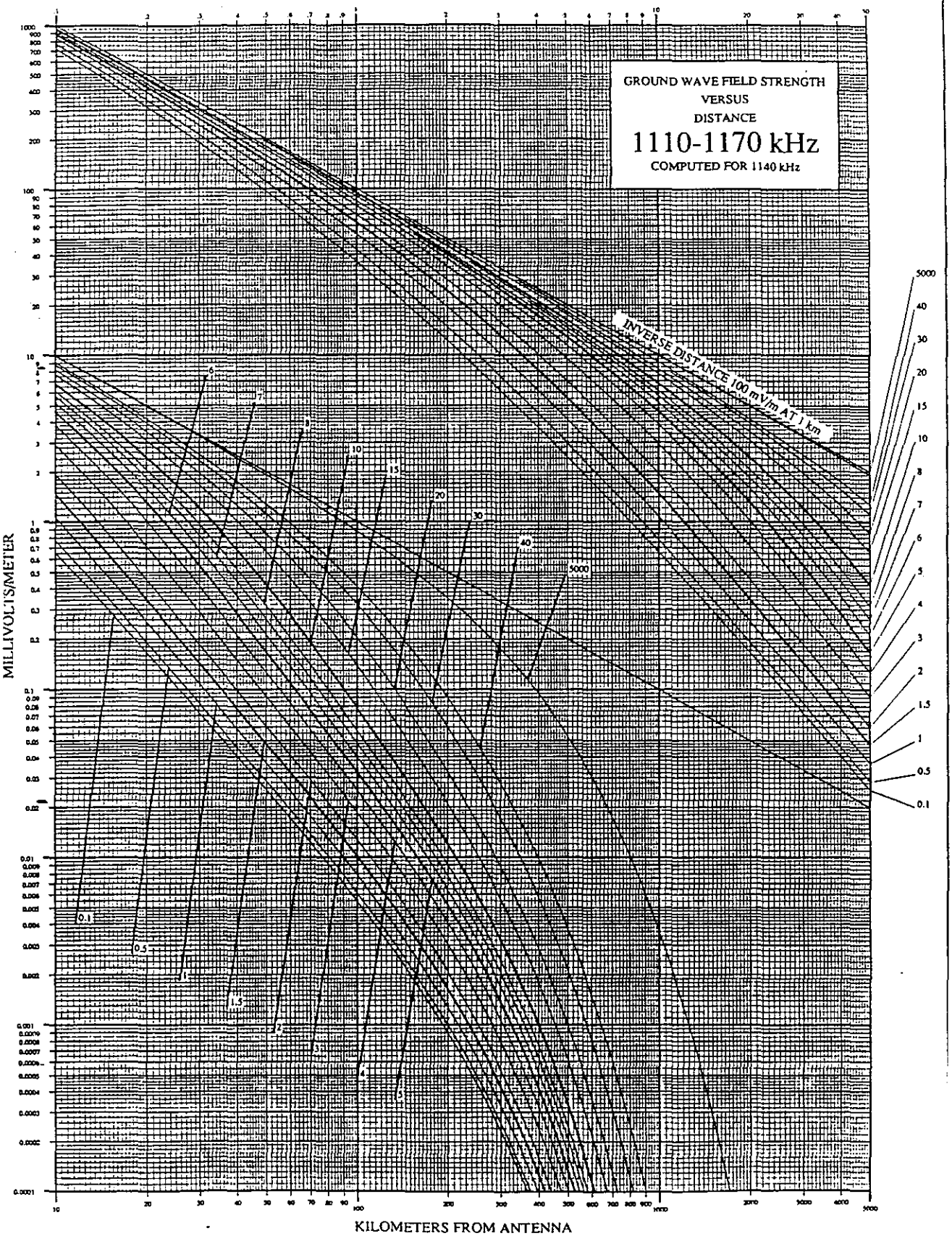

GRAPH 14

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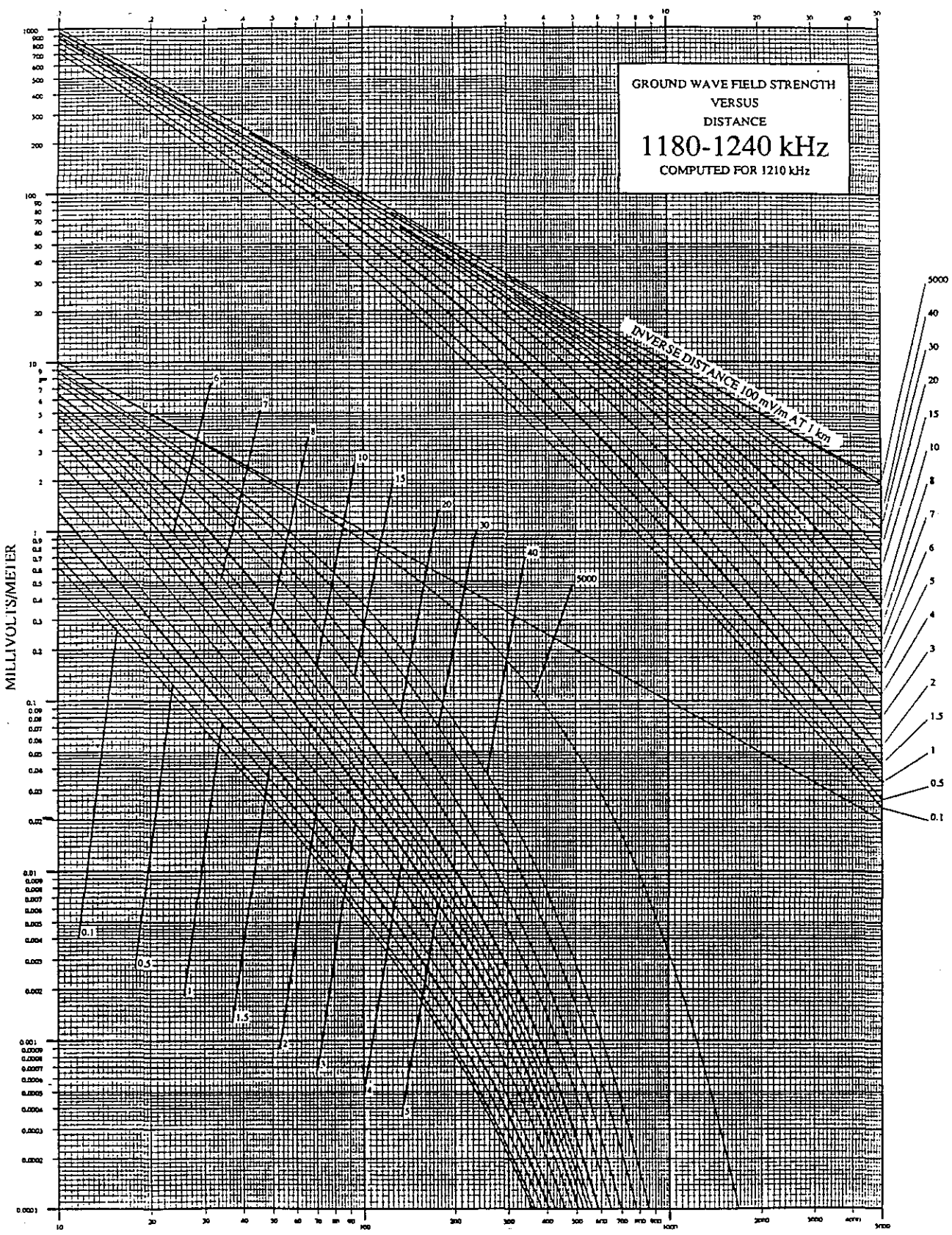

GRAPH 15

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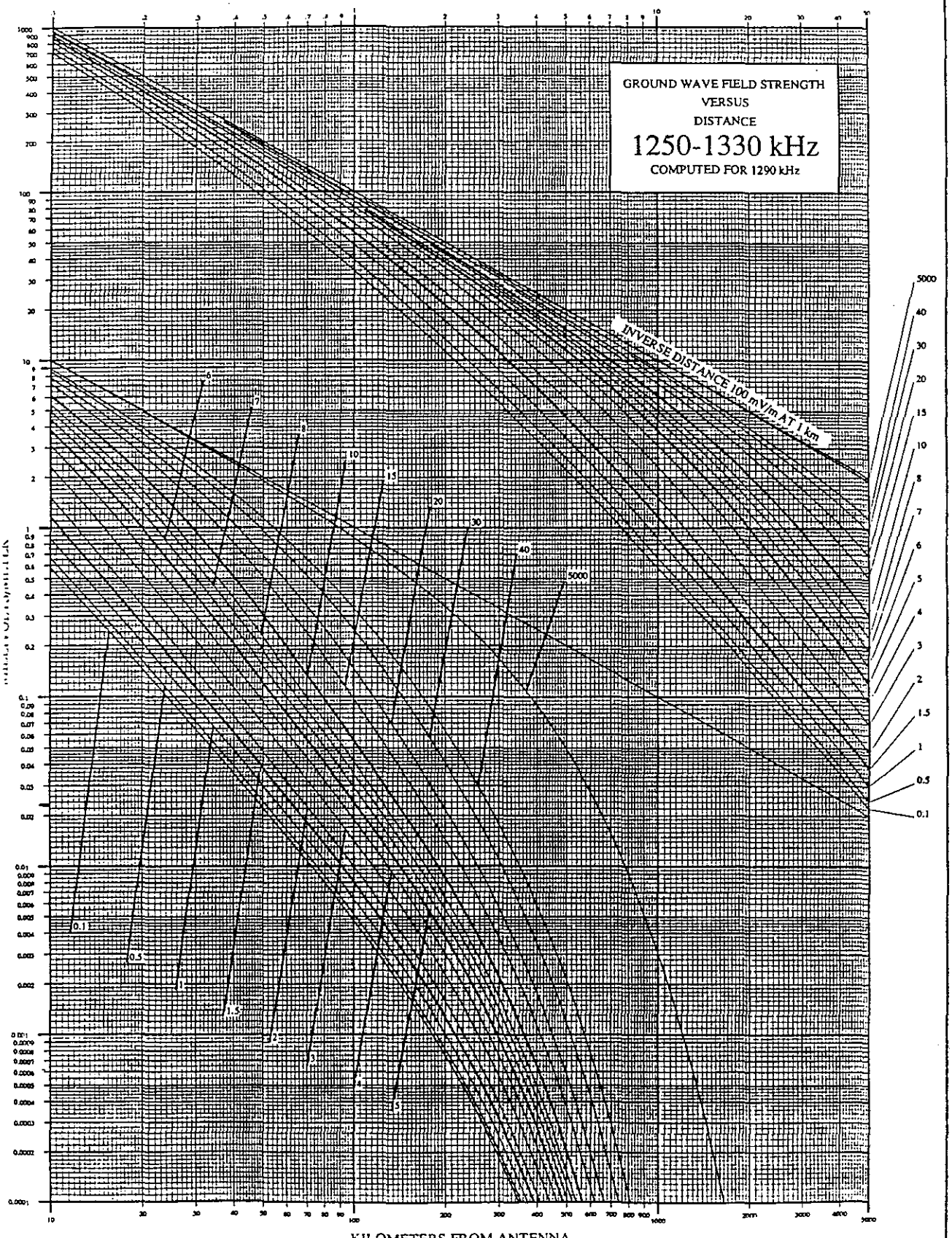

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GRAPH 16

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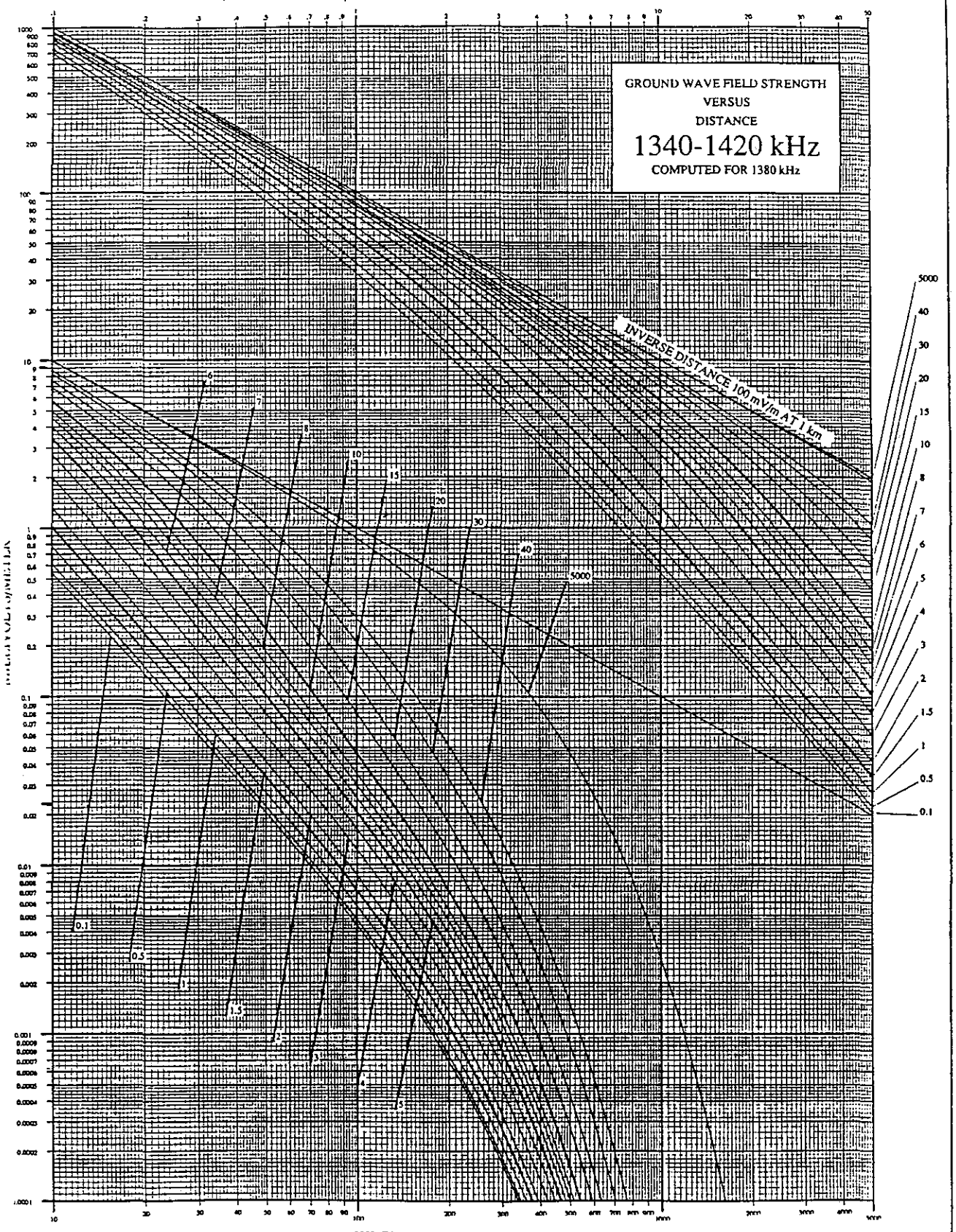

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GRAPH 17

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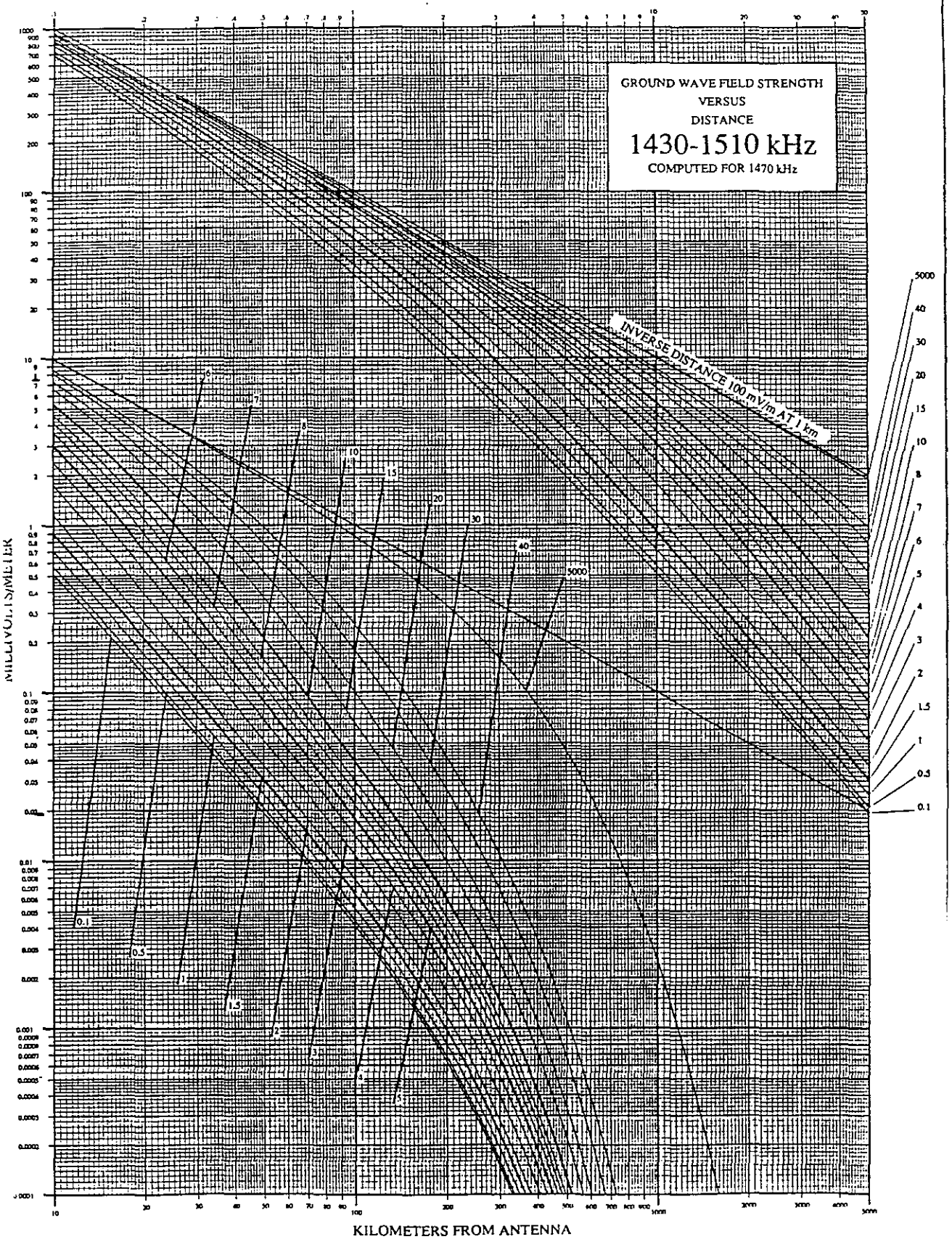

GRAPH 18

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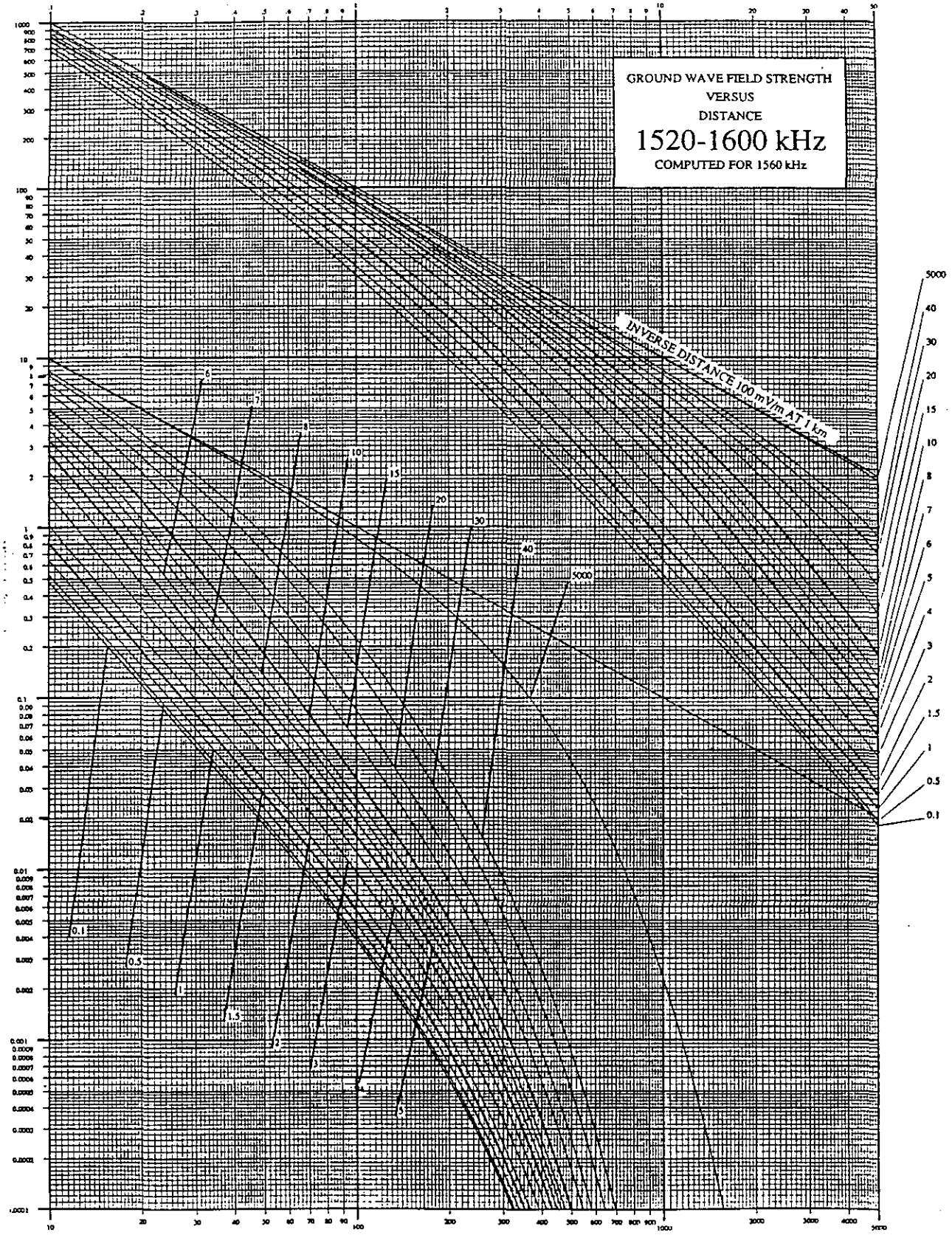

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GRAPH 19

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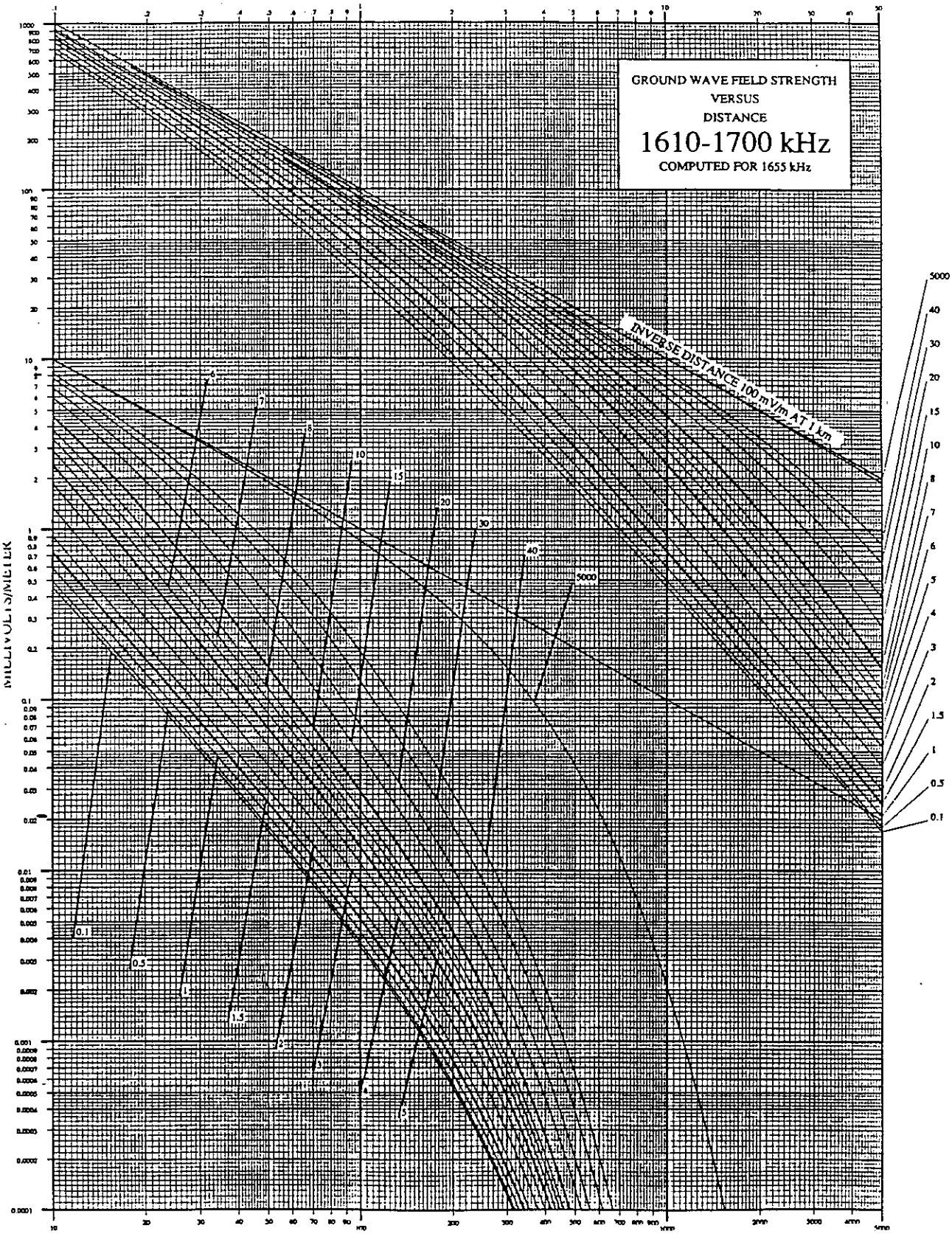

KILOMETERS FROM ANTENNA

GRAPH 20

30. Section 73.185 is amended by adding paragraph (c) to paragraph (b) and revising the new paragraph (b), by revising and redesignating paragraphs (d) and (e) as (c) and (d), by removing paragraphs (i) and (j), and revising and redesignating paragraphs (h) and (k) as (e) and (f), and by revising new paragraph (f)(2) to read as follows:

§73.185 Computation of interfering signal.

(a) * * *

(b) For skywave signals from stations operating on all channels, interference shall be determined from the appropriate formulas and Figure 6a contained in §73.190.

(c) The formulas in §73.190(d) depicted in Figure 6a of §73.190, entitled "Angles of Departure versus Transmission Range" are to be used in determining the angles in the vertical pattern of the antenna of an interfering station to be considered as pertinent to transmission by one reflection. To provide for variation in the pertinent vertical angle due to variations of ionosphere height and ionosphere scattering, the curves 2 and 3 indicate the upper and lower angles within which the radiated field is to be considered. The maximum value of field strength occurring between these angles shall be used to determine the multiplying factor to apply to the 10 percent skywave field intensity value determined from Formula 2 in §73.190. The multiplying factor is found by dividing the maximum radiation between the pertinent angles by 100 mV/m.

(d) Example of the use of skywave curves and formulas: Assume a proposed new Class B station from which interference may be expected is located at a distance of 724 kilometers from a licensed Class B station. The proposed station specifies geographic coordinates of 40° 00′ 00″ N and 100° 00′ 00″ W and the station to be protected is located at an azimuth of 45° true at geographic coordinates of 44 26' 05" N and 93 32' 54" W. The critical angles of radiation as determined from Figure 6a of §73.190 for use with Class B stations are 9.6° and 16.3°. If the vertical pattern of the antenna of the proposed station in the direction of the existing station is such that, between the angles of 9.6° and 16.3° above the horizon the maximum radiation is 260 mV/m at one kilometer, the value of the 50% field, as derived from Formula 1 of §73.190, is 0.06217 mV/m at the location of the existing station. To obtain the value of the 10% field, the 50% value must be adjusted by a factor derived from Formula 2 of §73.190. The value in this case is 8.42 dB. Thus, the 10% field is 0.1616 mV/m. Using this in conjunction with the co-channel protection ratio of 26 dB, the resultant nighttime limit from the proposed station to the licensed station is 3.232 mV/m.

(e) In the case of an antenna which is non-directional in the horizontal plane, the vertical distribution of the relative fields should be computed pursuant to §73.160. In the case of an antenna which is directional in the horizontal plane, the vertical pattern in the great circle direction toward the point of reception in question must first be calculated. In cases where the radiation in the vertical plane, at the pertinent azimuth, contains a large lobe at a higher angle than the pertinent angle for one reflection, the method of calculating interference will not be restricted to that just described; each such case will be considered on the basis of the best

knowledge available.

(f) In performing calculations to determine permissible radiation from stations operating presunrise or postsunset in accordance with §73.99, calculated diurnal factors will be multiplied by the values of skywave field strength for such stations obtained from Formula 1 or 2 of §73.190.

(1) * * *

(2) Constants used in calculating diurnal factors for the presunrise and postsunset periods are contained in paragraphs (f)(2)(i) and (ii) respectively. The columns labeled T_{mp} represent the number of hours before and after sunrise and sunset at the path midpoint.

* * * * *

31. Section 73.187 is amended by revising paragraphs (a)(1) and (2), (a)(2)(i), (a)(2)(ii), (a)(3), (a)(3)(i), (a)(3)(ii), and (b) to read as follows:

§73.187 Limitation on daytime radiation.

(a)(1) Except as otherwise provided in paragraphs (a)(2) and (3) of this section, no authorization will be granted for a Class B or Class D station on a frequency specified in §73.25 if the proposed operation would radiate during the period of critical hours (the two hours after local sunrise and the two hours before local sunset) toward any point on the 0.1 mV/m contour of a co-channel U.S. Class A station, at or below the pertinent vertical angle determined from Curve 2 of Figure 6a of §73.190, values in excess of those obtained as provided in paragraph (b) of this section.

(2) The limitation set forth in paragraph (a)(1) of this section shall not apply in the following cases:

(i) Any Class B or Class D operation authorized before November 30, 1959; or

(ii) For Class B and Class D stations authorized before November 30, 1959, subsequent changes of facilities which do not involve a change in frequency, an increase in radiation toward any point on the 0.1 mV/m contour of a co-channel U.S. Class A station, or the move of transmitter site materially closer to the 0.1 mV/m contour of such Class A station.

(3) A Class B or Class D station authorized before November 30, 1959, and subsequently authorized to increase daytime radiation in any direction toward the 0.1 mV/m contour of a co-channel U.S. Class A station (without a change in frequency or a move of transmitter site materially closer to such contour), may not, during the two hours after local sunrise or the two hours before local sunset, radiate in such directions a value exceeding the higher of:

(i) The value radiated in such directions with facilities last authorized before November 30, 1959, or

(ii) The limitation specified in paragraph (a)(1) of this section.

(b) To obtain the maximum permissible radiation for a Class B or Class D station on a given frequency from 640 through 990 kHz, multiply the radiation value obtained for the given distance and azimuth from the 500 kHz chart (Figure 9 of §73.190) by the appropriate interpolation factor shown in the K_{500} column of paragraph (c) of this section; and multiply the radiation value obtained for the given distance and azimuth from the 1000 kHz chart (Figure 10 of §73.190) by the appropriate interpolation factor shown in the K_{1000} column of paragraph (c) of this section. Add the two products thus obtained; the result is the maximum radiation value applicable to the Class B or Class D station in the pertinent directions. For frequencies from 1010 to 1580 kHz, obtain in a similar manner the proper radiation values from the 1000 and 1600 kHz charts (Figures 10 and 11 of §73.190), multiply each of these values by the appropriate interpolation factors in the K'_{1000} and K'_{1600} columns in paragraph (c) of this section, and add the products.

* * * * *

32. Section 73.189 is amended by revising paragraphs (b)(2)(i), (b)(2)(ii), (b)(2)(iii), (b)(3), and (b)(6), to read as follows:

§73.189 Minimum antenna heights or field strength requirements.

* * * * *

(b) * * *

(2) * * *

(i) Class C stations, and stations in Alaska, Hawaii, Puerto Rico and the U.S. Virgin Islands on 1230, 1240, 1340, 1400, 1450 and 1490 kHz that were formerly Class C and were redesignated as Class B pursuant to §73.26(b), 45 meters or a minimum effective field strength of 241 mV/m for 1 kW (121 mV/m for 0.25 kW). (This height applies to a Class C station on a local channel only. Curve A shall apply to any Class C stations in the 48 conterminous States that are assigned to Regional channels.)

(ii) Class A (Alaska), Class B and Class D stations other than those covered in §73.189(b)(2)(i), a minimum effective field strength of 282 mV/m for 1 kW.

(iii) Class A stations, a minimum effective field strength of 362 mV/m for 1 kW.

(3) The heights given on the graph for the antenna apply regardless of whether the antenna is located on the ground or on a building. Except for the reduction of shadows, locating the

antenna on a building does not necessarily increase the efficiency and where the height of the building is in the order of a quarter wave the efficiency may be materially reduced.

* * * * *

(6) The main element or elements of a directional antenna system shall meet the above minimum requirements with respect to height or effective field strength. No directional antenna system will be approved which is so designed that the effective field of the array is less than the minimum prescribed for the class of station concerned, or in case of a Class A station less than 90 percent of the ground wave field which would be obtained from a perfect antenna of the height specified by Figure 7 of §73.190 for operation on frequencies below 1000 kHz, and in the case of a Class B or Class D station less than 90 percent of the ground wave field which would be obtained from a perfect antenna of the height specified by Figure 7 of §73.190 for operation on frequencies below 750 kHz.

33. Section 73.190 is amended by revising paragraphs (a), (b), (c), and (e) to read as follows:

§73.190 Engineering charts and related formulas.

(a) This section consists of the following Figures: 2, r3, 5, 6a, 7, 8, 9, 10, 11, 12, and 13. Additionally, formulas that are directly related to graphs are included.

(b) Formula 1 is used for calculation of 50% skywave field strength values.

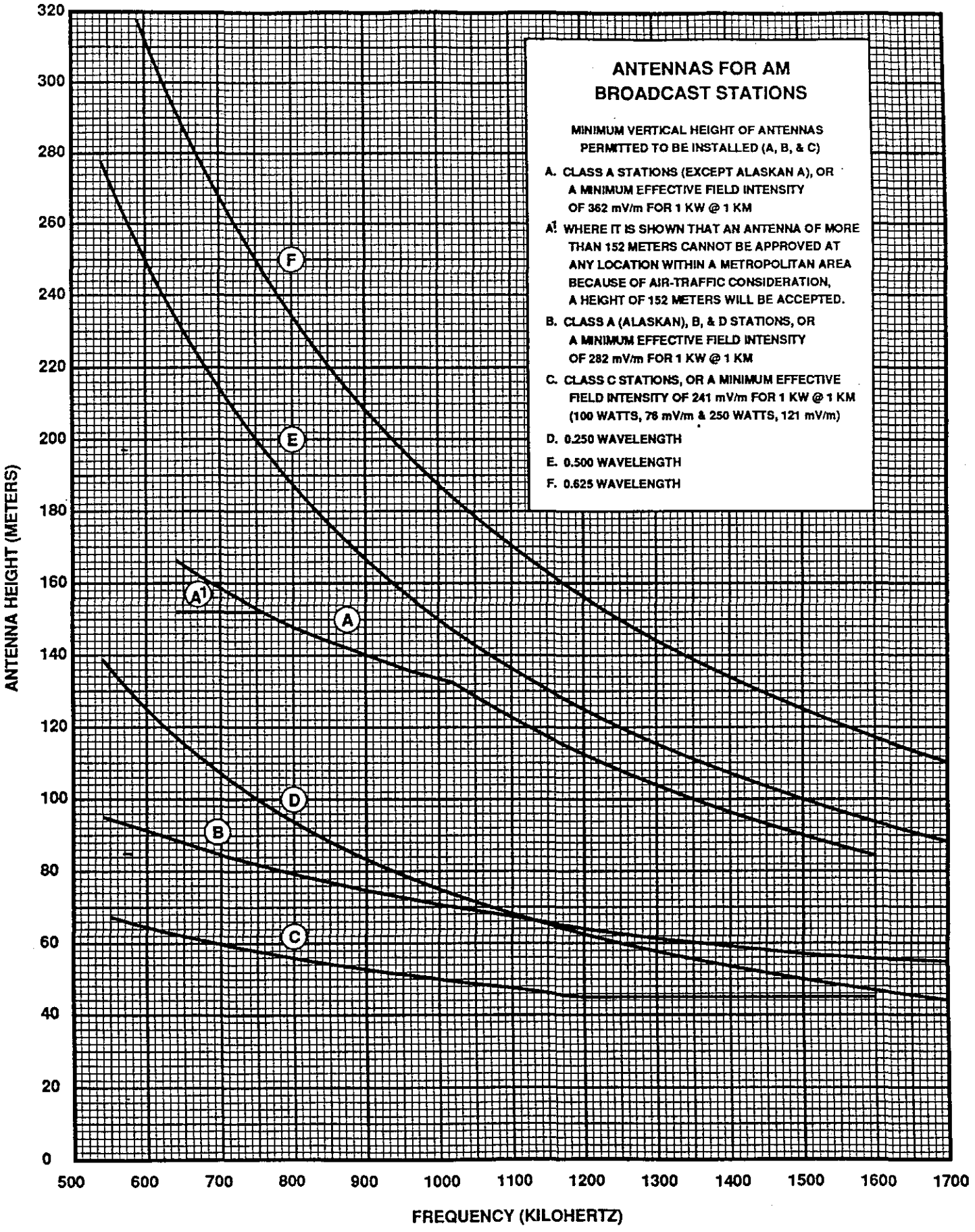
ANTENNAS FOR AM
BROADCAST STATIONS
MINIMUM VERTICAL HEIGHT OF ANTENNAS
PERMITTED TO BE INSTALLED (A, B, & C)
A. CLASS A STATIONS (EXCEPT ALASKAN A), OR
A MINIMUM EFFECTIVE FIELD INTENSITY
OF 362 mV/m FOR 1 KW @ 1 KM
A1. WHERE IT IS SHOWN THAT AN ANTENNA OF MORE
THAN 152 METERS CANNOT BE APPROVED AT
ANY LOCATION WITHIN A METROPOLITAN AREA
BECAUSE OF AIR-TRAFFIC CONSIDERATION,
A HEIGHT OF 152 METERS WILL BE ACCEPTED.
B. CLASS A (ALASKAN), B, & D STATIONS, OR
A MINIMUM EFFECTIVE FIELD INTENSITY
OF 282 mV/m FOR 1 KW @ 1 KM
C. CLASS C STATIONS, OR A MINIMUM EFFECTIVE
FIELD INTENSITY OF 241 mV/m FOR 1 KW @ 1 KM
(100 WATTS, 76 mV/m & 250 WATTS, 121 mV/m)
D. 0.250 WAVELENGTH
E. 0.500 WAVELENGTH
F. 0.625 WAVELENGTH
ANTENNA HEIGHT (METERS)
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
F
E
A1
A
D
B
C
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
FREQUENCY (KILOHERTZ)

Figure 7

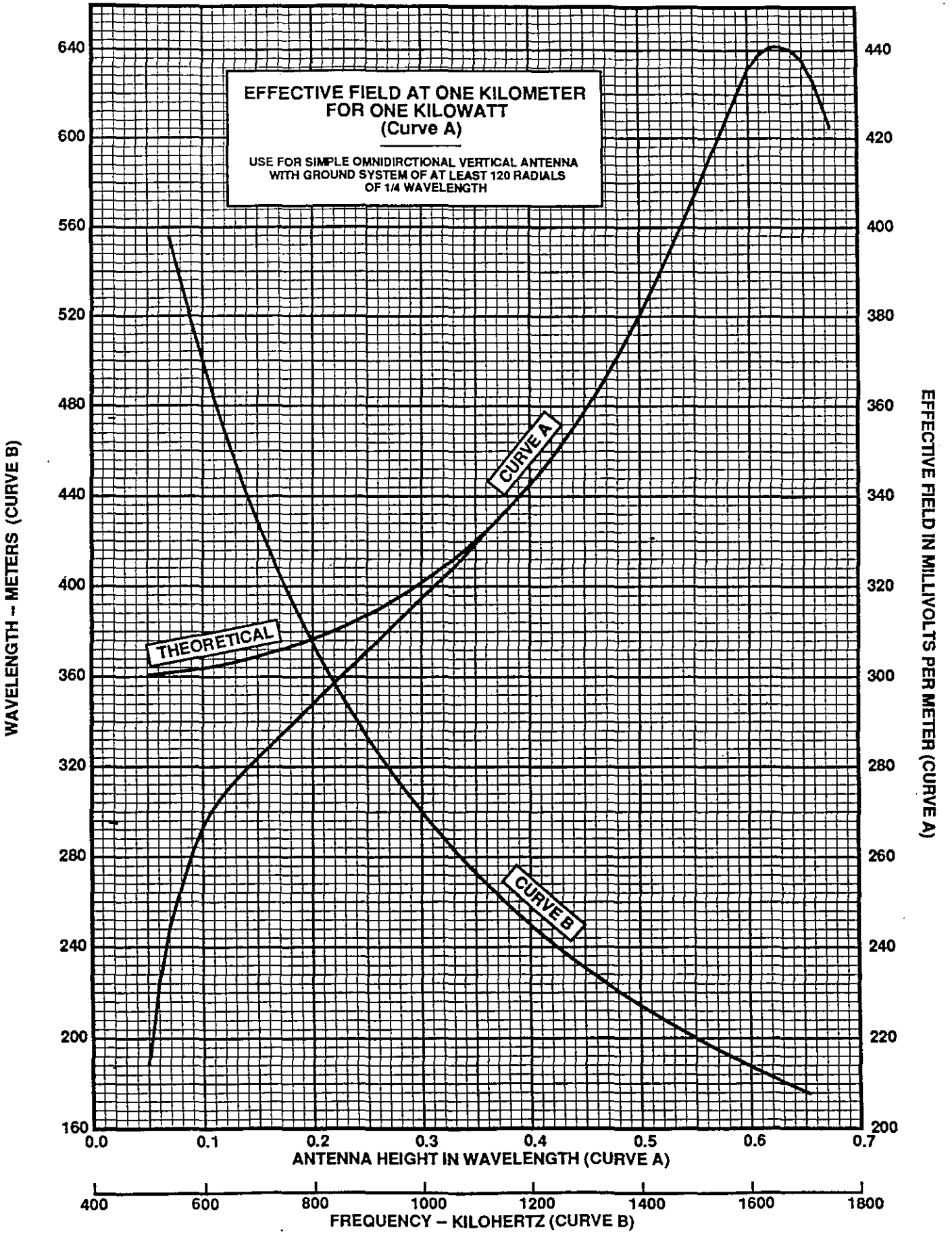
EFFECTIVE FIELD AT ONE KILOMETER
FOR ONE KILOWATT
(Curve A)
USE FOR SIMPLE OMNIDIRCTIONAL VERTICAL ANTENNA
WITH GROUND SYSTEM OF AT LEAST 120 RADIALS
OF 1/4 WAVELENGTH
CURVE A
THEORETICAL
CURVE B
WAVELENGTH – METERS (CURVE B)
EFFECTIVE FIELD IN MILLIVOLTS PER METER (CURVE A)
640
600
560
520
480
440
400
360
320
280
240
200
160
440
420
400
380
360
340
320
300
280
260
240
220
200
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
ANTENNA HEIGHT IN WAVELENGTH (CURVE A)
400
600
800
1000
1200
1400
1600
1800
FREQUENCY – KILOHERTZ (CURVE B)

Figure 8

Formula 1. Skywave field strength, 50% of the time (at SS+6):

The skywave field strength, $F_c(50)$, for a characteristic field strength of 100 mV/m at 1 km is given by:

$$F_c(50) = (97.5 - 20\log D) - (2\pi + 4.95\tan^2 \phi_M)\sqrt{\left(\frac{D}{1000}\right)} \qquad dB(\mu V/m) \qquad \text{(Eq. 1)}$$

The slant distance, D, is given by:

$$D = \sqrt{40{,}000 + d^2} \qquad km \qquad \text{(Eq. 2)}$$

The geomagnetic latitude of the midpoint of the path, ϕ_M, is given by:

$$\phi_M = \arcsin[\sin a_M \sin 78.5° + \cos a_M \cos 78.5° \cos(69 + b_M)] \qquad degrees \qquad \text{(Eq. 3)}$$

The short great-circle path distance, d, is given by:

$$d = 111.18 d° \qquad km \qquad \text{(Eq. 4)}$$

Where:

$$d° = \arccos[\sin a_T \sin a_R + \cos a_T \cos a_R \cos(b_R - b_T)] \qquad degrees \qquad \text{(Eq. 5)}$$

Where:

a_T is the geographic latitude of the transmitting terminal (degrees)
a_R is the geographic latitude of the receiving terminal (degrees)
b_T is the geographic longitude of the transmitting terminal (degrees)
b_R is the geographic longitude of the receiving terminal (degrees)
a_M is the geographic latitude of the midpoint of the great-circle path (degrees) and is given by:

$$a_M = 90 - \arccos\left[\sin a_R \cos\left(\frac{d°}{2}\right) + \cos a_R \sin\left(\frac{d°}{2}\right)\left(\frac{\sin a_T - \sin a_R \cos d°}{\cos a_R \sin d°}\right)\right] \qquad \text{(Eq. 6)}$$

b_M is the geographic longitude of the midpoint of the great-circle path (degrees) and is given by:

$$b_M = b_R + k\left[\arccos\left(\frac{\cos\left(\frac{d°}{2}\right) - \sin a_R \sin a_M}{\cos a_R \cos a_M}\right)\right] \qquad \text{(Eq. 7)}$$

Note (1): If $|\phi_M|$ is greater than 60 degrees, equation (1) is evaluated for $|\phi_M| = 60$ degrees.
Note (2): North and east are considered positive; south and west negative.
Note (3): In equation (7), $k = -1$ if $b_R > b_T$, otherwise $k = 1$.

(c) Formula 2 is used for calculation of 10% skywave field strength values.

Formula 2. Skywave field strength, 10% of the time (at SS+6):

The skywave field strength, $F_c(10)$, is given by:

$$F_c(10) = F_c(50) + \Delta \qquad dB(\mu V/m)$$

Where: $\Delta = 6$ when $|\phi_M| < 40$
$\Delta = 0.2\ |\phi_M| - 2$ when $40 \leq |\phi_M| \leq 60$
$\Delta = 10$ when $|\phi_M| > 60$

* * * * *

(e) In the event of disagreement between computed values using the formulas shown above and values obtained directly from the figures, the computed values will control.

34. Section 73.1030 is amended by revising the table in paragraph (b) to read as follows:

§73.1030 Notifications concerning interference to radio astronomy, research and receiving installations.

* * * * *

(b) * * *

Frequency range	Field Strength in Authorized Bandwidth of Service (mV/m)	Power Flux Density in Authorized Bandwidth of Service (dBW/m^2) 1/
Below 540 kHz	10	-65.8
540 to 1700 kHz	20	-59.8
1.7 to 470 MHz	10	-65.8 2/
470 to 890 MHz	30	-56.2 2/
Above 890 MHz	1	-85.8 2/

1/ Equivalent values of power flux density are calculated assuming free space characteristic impedance of 376.7 = 120 ohms.

2/ Space stations shall conform to the power flux density limits at the earth's surface specified in appropriate parts of the FCC rules, but in no case should exceed the above levels in any 4 kHz band for all angles of arrival.

* * * * *

35. Section 73.1125 is amended by adding a note to read as follows:

§73.1125 Station main studio location.

* * * * *

Note: AM stations that simulcast on a frequency in the 535-1605 kHz band and on a frequency in the 1605-1705 kHz band need only have the studio be located within the 5 mV/m contour of the lower band operation during the term of the simultaneous operating authority. Upon termination of the 535-1605 kHz band portion of the dual frequency operation, the above rule shall then become applicable to the remaining operation in the 1605-1705 kHz band.

36. A new paragraph (c) is added to Section 73.1150 to read as follows:

§73.1150 Transferring a station.

* * * * *

(c) Licensees and/or permittees authorized to operate in the 535-1605 kHz and in the 1605-1705 kHz band pursuant to the Report and Order in MM Docket No. 87-267 will not be permitted to assign or transfer control of the license or permit for a single frequency during the period that joint operation is authorized.

37. Section 73.1201 is amended by revising paragraph (c)(2) to read as follows:

§73.1201 Station identification.

* * * * *

(c) * * *

(2) Simultaneous AM (535-1605 kHz) and AM (1605-1705 kHz) broadcasts. If the same licensee operates an AM broadcast station in the 535-1605 kHz band and an AM broadcast station in the 1605-1705 kHz band with both stations licensed to the same community and simultaneously broadcasts the same programs over the facilities of both such stations, station identification announcements may be made jointly for both stations for periods of such simultaneous operation.

* * * * *

38. Paragraph (b)(1)ii) of Section 73.1570 is revised to read as follows:

§73.1570 Modulation levels: AM, FM, and TV aural.

* * * * *

(b) * * *

(1) * * *

(ii) For AM stations transmitting telemetry signals for remote control or automatic transmission system operation, the amplitude of modulation of the carrier by the use of subaudible tones must not be higher than necessary to effect reliable and accurate data transmission and may not, in any case, exceed 6%.

* * * * *

39. Section 73.1650 is amended by revising paragraph (b)(2) and adding paragraphs (b)(2)(i) and (b)(2)(ii) to read as follows:

§73.1650 International broadcasting agreements.

* * * * *

(b) * * *

(2) Regional Agreements for the Broadcasting Service in Region 2:

(i) MF Broadcasting 535-1605 kHz, Rio de Janeiro, 1981.

(ii) MF Broadcasting 1605-1705 kHz, Rio de Janeiro, 1988.

* * * * *

40. A note is added at the end of Section 73.1665 to read as follows:

§73.1665 Main transmitters.

* * * * *

Note: Pending the availability of AM broadcast transmitters that are type-accepted for use in the 1605-1705 kHz band, transmitters that are type-accepted for use in the 535-1605 kHz band as shown on the FCC's *Radio Equipment List* may be utilized in the 1605-1705 kHz band if it is shown that the requirements of §73.44 have been met. FCC approval of the manufacturer's application for type-acceptance will supersede the applicability of this note.

41. Paragraph (c) in Section 73.1705 is revised to read as follows:

§73.1705 Time of operation.

* * * * *

(c) AM stations in the 535-1705 kHz band will be licensed for unlimited time. In the 535-1605 kHz band, stations that apply for share time and specified hours operations may also be licensed. AM stations licensed to operate daytime-only and limited-time may continue to do so; however, no new such stations will be authorized, except for fulltime stations that reduce operating hours to daytime-only for interference reduction purposes.

42. Section 73.1725 is revised to read as follows:

§73.1725 Limited time.

(a) Operation is applicable only to Class B (secondary) AM stations on a clear channel with facilities authorized before November 30, 1959. Operation of the secondary station is permitted during daytime and until local sunset if located west of the Class A station on the channel, or until local sunset at the Class A station if located east of that station. Operation is also permitted during nighttime hours not used by the Class A station or other stations on the channel.

(b) No authorization will be granted for:

(1) A new limited time station;

(2) A limited time station operating on a changed frequency;

(3) A limited time station with a new transmitter site materially closer to the 0.1 mV/m contour of a co-channel U.S. Class A station; or

(4) Modification of the operating facilities of a limited time station resulting in increased radiation toward any point on the 0.1 mV/m contour of a co-channel U.S. Class A station during the hours after local sunset in which the limited time station is permitted to operate by reason of location east of the Class A station.

(c) The licensee of a secondary station which is authorized to operate limited time and which may resume operation at the time the Class A station (or stations) on the same channel ceases operation shall, with each application for renewal of license, file in triplicate a copy of its regular operating schedule. It shall bear a signed notation by the licensee of the Class A station of its objection or lack of objection thereto. Upon approval of such operating schedule, the FCC will affix its file mark and return one copy to the licensee authorized to operate limited time. This shall be posted with the station license and considered as a part thereof. Departure from said operating schedule will be permitted only pursuant to §73.1715 (Share time).

43. Section 73.1740 is amended by revising paragraph (a)(1)(i) to read as follows:

§73.1740 Minimum operating schedule.

(a) * * *

(1) * * *

(i) Class D stations which have been authorized nighttime operations need comply only with the minimum requirements for operation between 6 a.m. and 6 p.m., local time.

* * * * *

44. Paragraph (a) of Section 73.3516 is revised to read as follows:

§73.3516 Specification of Facilities

(a) An application for facilities in the AM, FM, or TV broadcast services or low power TV service shall be limited to one frequency, or channel, and no application will be accepted for filing if it requests an alternate frequency or channel. Applications specifying split frequency AM operations using one frequency during daytime hours complemented by a different frequency during nighttime hours will not be accepted for filing.

* * * * *

45. New paragraphs (c) and (d) and Notes 1 and 2 are added to Section 73.3517 to read as follows:

§73.3517 Contingent applications.

* * * * *

(c) Upon payment of the filing fees prescribed in §1.1111 of this chapter, the Commission will accept two or more applications filed by existing AM licensees for modification of facilities that are contingent upon granting of both, if granting such contingent applications will reduce interference to one or more AM stations or will otherwise increase the area of interference-free service. The applications must state that they are filed pursuant to an interference reduction arrangement and must cross-reference all other contingent applications.

(d) Modified proposals curing conflicts between mutually exclusive clusters of applications filed in accordance with section (c) will be accepted for 60 days following issuance of a public notice identifying such conflicts.

Note 1: No application to move to a frequency in the 1605-1705 kHz band may be part of any

package of contingent applications associated with a voluntary agreement.

Note 2: In cases where no modified proposal is filed pursuant to section (d), the Commission will grant the application resulting in the greatest net interference reduction.

46. Paragraph (i) in Section 73.3550 is revised to read as follows:

§73.3550 Requests for new or modified call sign assignments.

* * * * *

(i) Stations in different broadcast services (or operating jointly in the 535-1605 kHz band and in the 1605-1705 kHz band) which are under common control may request that their call signs be conformed by the assignment of the same basic call sign if that call sign is not being used by a non-commonly owned station. For the purposes of this paragraph, 50% or greater common ownership shall constitute a prima facie showing of common control.

* * * * *

47. Section 73.3555 is amended by revising Note 4 and adding new Notes 8 and 9 and 10 to read as follows:

§73.3555 Multiple ownership.

* * * * *

Note 4: Paragraphs (a) through (d) of this section will not be applied to require divestiture, by any licensee, of existing facilities, and will not apply to applications for increased power for Class C stations, to applications for assignment of license or transfer of control filed in accordance with §73.3540(f) or §73.3541(b) of this part, or to applications for assignment of license or transfer of control to heirs or legatees by will or intestacy if no new or increased overlap would be created between commonly owned, operated, or controlled broadcast stations in the same service and if no new encompassment of communities proscribed in paragraphs (b) and (c) of this section as to commonly owned, operated, or controlled broadcast stations or daily newspapers would result. Said paragraphs will apply to all applications for new stations, to all other applications for assignment or transfer, and to all applications for major changes in existing stations except major changes that will result in overlap of contours of broadcast stations in the same service with each other no greater than already existing. (The resulting areas of overlap of contours of such broadcast stations with each other in such major change cases may consist partly or entirely of new terrain. However, if the population in the resulting overlap areas substantially exceeds that in the previously existing overlap areas, the Commission will not grant the application if it finds that to do so would be against the public interest, convenience, or necessity.) Commonly owned, operated, or controlled broadcast stations, with overlapping contours or with community-encompassing contours prohibited by this section may not be

assigned or transferred to a single person, group, or entity, except as provided above in this note. If a commonly owned, operated, or controlled broadcast station and daily newspaper fall within the encompassing proscription of this section, the station may not be assigned to a single person, group or entity if the newspaper is being simultaneously sold to such single person, group or entity.

* * * * *

Note 8: Paragraph (a)(1) of this section will not apply to an application for an AM station license in the 535-1605 kHz band where grant of such application will result in the overlap of 5 mV/m groundwave contours of the proposed station and that of another AM station in the 535-1605 kHz band that is commonly owned, operated or controlled if the applicant shows that a significant reduction in interference to adjacent or co-channel stations would accompany such common ownership. Such AM overlap cases will be considered on a case-by-case basis to determine whether common ownership, operation or control of the stations in question would be in the public interest. Applicants in such cases must submit a contingent application for the major or minor facilities change needed to achieve the interference reduction along with the application which seeks to create the 5 mV/m overlap situation.

Note 9: Paragraph (a)(1) of this section will not apply to an application for an AM station license in the 1605-1705 kHz band where grant of such application will result in the overlap of the 5 mV/m groundwave contours of the proposed station and that of another AM station in the 535-1605 kHz band that is commonly owned, operated or controlled. Paragraphs (d)(1)(i) and (d)(1)(ii) of this section will not apply to an application for an AM station license in the 1605-1705 kHz band by an entity that owns, operates, controls or has a cognizable interest in AM radio stations in the 535-1605 kHz band.

Note 10: Authority for joint ownership granted pursuant to Note 9 will expire at 3:00 a.m. local time on the fifth anniversary of the date of issuance of a construction permit for an AM radio station in the 1605-1705 kHz band.

48. Section 73.3564 is amended by adding a new paragraph (e) to read as follows:

§73.3564 Acceptance of applications.

* * * * *

(e) Applications for operation in the 1605-1705 kHz band will be accepted only if filed pursuant to the terms of §73.30(b).

49. Section 73.3570 is redesignated as Section 73.23.

50. Section 73.3571 is amended by revising paragraphs (a), and (a)(1), by adding a new paragraph (a)(3), by removing paragraphs (d)(1), (d)(4), and (e), by revising and redesignating

paragraphs (d)(2) and (d)(3) as (d)(1) and (d)(2), by redesignating paragraphs (f) through (i) as (e) through (h) and revising new paragraphs (f) and (h), by redesignating paragraphs (j)(1), (j)(2), (j)(3), and (j)(4) as (i)(1), (i)(2), (i)(3), and (i)(4) and revising the text of new paragraph (i)(1), and by redesignating paragraphs (k) and (l) as paragraphs (j) and (k) to read as follows:

§73.3571 Processing of AM broadcast station applications.

(a) Applications for AM broadcast facilities are divided into three groups.

(1) In the first group are applications for new stations or for major changes in the facilities of authorized stations. A major change is any increase in power except where accompanied by a complementary reduction of antenna efficiency which leads to the same amount, or less, radiation in all directions (in the horizontal and vertical planes when skywave propagation is involved, and in the horizontal plane only for daytime considerations), relative to the presently authorized radiation levels, or any change in frequency, hours of operation, or community of license. 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.

(2) * * *

(3) The third group consists of applications for operation in the 1605-1705 kHz band which are filed subsequent to Commission notification that allotments have been awarded to petitioners under the procedure specified in §73.30.

* * * * *

(d) Applications proposing to increase the power of an AM station are subject to the following requirements:

(1) In order to be acceptable for filing, any application which does not involve a change in site must propose at least a 20% increase in the station's nominal power.

(2) Applications involving a change in site are not subject to the requirements in paragraph (d)(1) of this section.

(3) * * *

(4) Applications for nighttime power increases for Class D stations are not subject to the requirements of this section and will be processed as minor changes.

* * * * *

(f) Applications for change of license to change hours of operation of a Class C station, to decrease hours of operation of any other class of station, or to change station location involving no change in transmitter site will be considered without reference to the processing line.

* * * * *

(h) When an application which has been designated for hearing has been removed from the hearing docket, the application will be returned to its proper position (as determined by the file number) in the processing line. Whether or not a new file number will be assigned will be determined pursuant to paragraph (i) of this section, after the application has been removed from the hearing docket.

(i)(1) A new file number will be assigned to an application for a new station, or for major changes in the facilities of an authorized station, when it is amended to change frequency, to increase power, to increase hours of operation, or to change station location. Any other amendment modifying the engineering proposal, except an amendment regarding the type of equipment specified, will also result in the assignment of a new file number unless such amendment is accompanied by a complete engineering study showing that the amendment would not involve new or increased interference problems with existing stations or other applications pending at the time the amendment is filed. If, after submission and acceptance of such an engineering amendment, subsequent examination indicates new or increased interference problems with either existing stations or other applications pending at the time the amendment was received at the FCC, the application will then be assigned a new file number and placed in the processing line according to the numerical sequence of the new file number.

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51. New paragraph (c) is added to Section 73.3598 to read as follows:

§73.3598 Period of construction.

* * * * *

(c) An existing AM station operating in the 535-1605 kHz band that receives a conditional permit to operate in the 1605-1705 kHz band; such permit shall specify a period of not more than 18 months from the date of issuance of the original construction permit within which construction shall be completed and application for license filed.

52. Section 73.4160 is removed.

53. Section 73.4255 is revised to read as follows:

§73.4255 Tax certificates: Issuance of.

(a) See Public Notice, FCC 76-337, dated April 21, 1976. 59 FCC 2d, 91; 41 FR 17605, April 27, 1976.

(b) See Report and Order MM Docket 87-267, FCC 91-303 adopted, September 26, 1991.

Part 90 of Title 47 of the CFR is amended as follows:

54. The authority citiation for Part 90 continues to read as follows:

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

55. Section 90.17(b) is amended by adding 540 through 1700 kHz (1610 kHz had been previously assigned) to the Table of Frequencies as follows:

§90.17 Local Government Radio Service

(a) * * * * *

(b) Frequencies available.

* * * * *

Local Government Radio Service Frequency Table		
Frequency or Band (kHz)	Class of Station(s)	Limitations
530 540-1700 2726	Base (T.I.S.) do Base or Mobile	23 23 1

* * * * *

56. Section 90.242 is amended by revising the first sentence of (a), the first sentence of (a)(2)(i), and (a)(2)(ii) to read as follows:

§90.242 Travelers Information Stations.

(a) The frequencies 530 through 1700 kHz in 10 kHz increments. * * *

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