

EXTENDED BROADCAST HOURS FOR DAYTIME STATIONS, DOCKET No. 12274:

Petition of Daytime Broadcasters Association, Inc., to permit all daytime standard broadcast stations to operate from 5 a. m. or local sunrise (whichever is earlier) to 7 p. m. or local sunset (whichever is later) denied.

Rationale.—Population-gaining service would be far exceeded by population-losing service; daytime stations would serve only small fraction of daytime areas and populations during nondaytime hours; such severe interference would result to unlimited-time class II and III stations that many could not even serve their principal cities; almost all secondary service would be lost (some 20 million persons now receive only secondary service); would cause severe interference to foreign stations and violate international agreements and understandings; greater need exists for service that would be lost than for new service that would be gained.

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION**

WASHINGTON 25, D. C.

In the Matter of AMENDMENT OF PART 3 OF THE RULES TO PER- MIT EXTENDED HOURS OF BROADCASTING FOR DAYTIME STANDARD BROADCAST STATIONS.	}	Docket No. 12274
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REPORT AND ORDER

(Adopted: September 19, 1958)

BY THE COMMISSION: CHAIRMAN DOERFFER ABSENT; COMMISSIONER CROSS CONCURRING AND ISSUING A STATEMENT.

1. The Commission has before it for consideration its notice of proposed rulemaking (FCC 57-1387) issued in this proceeding on December 19, 1957, in response to a petition filed December 9, 1955, by the Daytime Broadcasters Association, Inc. (DBA), requesting *inter alia*, that all daytime standard broadcast stations be authorized to operate from 5 a. m. or local sunrise (whichever is earlier) to 7 p. m. or local sunset (whichever is later), in lieu of the sunrise to sunset hours provided for in the present rules.

Fundamentals of standard broadcast allocations:

2. Since the DBA proposal, if adopted, would permit general operation by daytime stations during hours other than daytime, it involves a departure from the long-established system of standard broadcast (AM) allocations. Hence, a brief discussion of present allocation principles is helpful in comprehending the effects and implications of the proposed action.

3. The portion of the radio spectrum allocated for standard broadcasting is between 535 and 1605 kc. Within this range there are 107 channels of 10 kc. each, on which over 3,300 standard broadcast stations are presently assigned. Under the Commission's basic allocation pattern, different channels are designated for use by different classes of

stations, which operate with different amounts of power and are intended to render service varying in extent. The number of stations which may be assigned to any particular frequency is limited by the fact that under favorable transmission conditions standard broadcast signals travel long distances, and create interference to the service of stations located on the same frequency or adjacent frequencies. A salient fact which must be borne in mind is that these signals cause destructive interference over an area much greater than that to which they provide useful service. Where two signals on the same frequency (cochannel) are involved, under the Commission's standards objectionable interference is present where the strength of the interfering signal is one-twentieth or more of the strength of the desired signal. Further, the range of AM radio signals—both those providing a usable service and those farther from the transmitter causing destructive interference—varies considerably as between the daytime and nighttime hours, because of the characteristics of skywave propagation.

4. The energy radiated from the transmitting antenna of a broadcast station is affected differently by the earth's surface and the upper atmosphere. Part of the energy, called the groundwave, travels closely along the surface, where its intensity in a given location remains almost constant day and night and from season to season. It is affected principally by the station frequency and power, and the character of the terrain over which it travels. At night, in addition to groundwave transmission, radio signals are propagated by skywave transmission, consisting of energy traveling upward and outward from the transmitter to an electrified layer called the ionosphere, from which it is reflected back to earth at distances much greater than the reach of groundwave signals. The range of skywave signals is affected by many more variables than groundwave signals, including latitude, time of year, the current stage of the sunspot cycle, and, particularly and most substantially, the time of day. Caused principally by the sun's radiation, the ionization of the upper atmosphere exhibits diurnal variations of such nature and extent that skywave signals, returned to earth with negligible intensity during most of the day, are reflected with great efficiency at night, where with varying intensity they reach distances far beyond the range of the groundwave. Skywave signals begin a measurable buildup about 2 hours before sunset, reach quasi-maximum values about 2 hours after sunset, maintain approximately that level until about 2 hours prior to sunrise, and then progressively deteriorate until they again reach insignificant levels about 2 hours after sunrise. Such signals are less constant in intensity than groundwave signals, because of the continuous change in the characteristics of the ionosphere, resulting in "fading" from time to time in skywave reception.

5. Skywave signals render a useful service over wide areas, although because of their somewhat intermittent nature such service is, under the Commission's rules, considered secondary service, whereas the more constant groundwave service is considered primary service. Such service by skywave transmission is possible, however, only under highly restricted conditions. Both transmitter power sufficient to propagate usable signals over long distances, and freedom from ob-

jectionable electrical interference which might prevent service of an acceptable standard, are required.

6. With the aforementioned radio propagation characteristics in mind, rules were adopted governing the assignment of standard broadcast stations to specific frequencies. These rules seek to achieve to the greatest possible extent the following three objectives:

- (a) To provide some service of satisfactory signal strength to all areas in the nation;
- (b) To provide as many program choices to as many listeners as possible;
- (c) To provide locally originated service to as many communities as possible.

7. The effective implementation of these three objectives produces inevitable conflict. Maximum area coverage can be obtained by using a single station or a very few high-powered stations on a given channel. On the other hand, the assignment of numerous stations on a channel to provide local outlets for as many communities as possible can only be accomplished by severely restricting station coverage to small areas ringed by interference from the numerous other stations on the channel. Similar conflicts affect the maximum attainment of objective (b). In view of the aforementioned marked differences between daytime and nighttime propagation of AM radio signals, the conflicts in implementing the three basic objectives are much greater during nighttime than during daytime. It is not engineeringly feasible to cover the entire United States with interference-free ground-wave (primary) signals at night. It is generally agreed that approximately half of the land area of the United States and some 20 million persons must depend on skywave (secondary) signals for nighttime radio service.

8. The impossibility of simultaneously implementing all three of the above-listed objectives on any single channel led to the classification of broadcast frequencies into separate groups, with different rules for the assignment of stations, depending upon the purpose for which each class of channels was established: (a) Clear-channel frequencies designed to provide primary (groundwave) and secondary (skywave) service over an extended area and at relatively long distances by high-powered stations known as class I stations; (b) regional frequencies designed for stations (known as class III stations) to render service primarily to metropolitan districts and the rural areas contiguous thereto; and (c) local frequencies designed for stations (known as class IV stations) to render service primarily to cities and/or towns and the suburban and rural areas contiguous thereto. This pattern of allocation dates from the adoption of the Commission's rules and standards, essentially in their present form as far as standard broadcasting is concerned, in 1939. Because of the relative inefficiency of skywave transmission during daylight hours, it is possible to assign many more stations to a given channel for daytime operation. Moreover, the assignment of daytime stations permits more efficient channel utility than would otherwise result. It has therefore been possible, and in furtherance of the basic objective of providing as much service and as many local broadcast outlets as possible, for the Commission to assign additional stations on the clear

and regional channels in various parts of the country limited to operation during the daytime hours, as well as to permit unlimited-time stations to operate with increased facilities during these hours. There are now about 1,400 daytime stations,¹ of which about 850 are assigned to regional channels and all but 1 of the remaining 550 to clear channels.

9. From the foregoing, it is apparent that the authorization of daytime stations was specifically intended to permit the utilization of spectrum space which, after accommodating other stations (i. e., clear-channel and full-time regional stations), was available during the day but not at night. By longstanding domestic usage and international agreement the hours for daytime broadcasts are those between sunrise and sunset. The subject DBA proposal would permit daytime stations to operate during the nighttime (postsunset and pre-sunrise) period during several months of the year.

Relation Between Instant Proceeding and Clear Channel (Docket No. 8741) and Daytime Skywave (Docket No. 8333) Rulemaking Proceedings

10. A grant of the instant DBA proposal would have a direct bearing upon two current rulemaking proceedings. As stated in paragraph 4, above, the appearance and disappearance of skywave transmission is not, as our present allocation rules might imply, an instantaneous phenomenon commencing precisely at sunset and ending precisely at sunrise. Data which have been accumulated from field intensity recordings of numerous stations have shown that skywave transmission, which is negligible during most of the day, builds up progressively in a significant degree at about 2 hours before sunset and reaches its approximate maximum at about 2 hours after sunset.² Likewise, nighttime skywave transmission, which begins to deteriorate progressively about 2 hours before sunrise, is present to a limited degree as long as 2 hours after sunrise. As a result, operation of daytime stations even within the period between sunrise and sunset causes progressively diminishing or increasing skywave interference to stations sharing the use of the channel and, to some extent, adjacent channel stations. This interference is sufficiently severe to impinge substantially on the service areas of stations which under the Commission's present allocation rules are entitled to protection from objectionable interference over the wide areas that they are intended to serve.

11. In 1947 the Commission initiated a rulemaking proceeding (docket No. 8333) to determine the existence, nature, and extent of daytime skywave transmission of standard broadcast signals and to

¹ The term "daytime station" as used herein includes approximately 15 stations which are licensed on clear channels as "limited time" stations. The only difference between the two groups is that where a limited-time station is located east of the dominant station on the same frequency it may operate until sunset at the dominant station, while daytime stations may operate only until local sunset.

² The order of magnitude of the increase is indicated by data in docket No. 8333. As an example, on a frequency in the middle of the standard broadcast band, a signal will increase roughly 40 times in intensity from 2 hours before sunset to sunset and will reach approximately 150 times the 2-hour-before-sunset intensity at 2 hours after sunset. The variation between presunset and postsunset signal intensity is more pronounced at lower frequencies and less pronounced at higher frequencies.

ascertain what, if any, changes should be made in the rules as a result of its findings. In March 1954, the Commission issued a proposed report and order in that proceeding (10 Pike and Fischer R. R. 1541), embodying amendments to the rules and technical standards which would restrict the daytime skywave radiation of interfering stations toward desired class I stations to a specifically prescribed degree. This could be achieved by reducing power, directionalizing interference signals away from the desired station, or both. While affording some degree of protection from daytime skywave interference, the proposed amendments reflect a compromise in that the restrictions were not so limited as to afford the cochannel class I stations the full degree of protection which was sought by these stations. In July 1954, the Commission held oral argument on the proposed rules, and subsequently received written comments concerning whether the proposed restrictions should be confined to new or changed station assignments or should be applied also to existing stations. The Commission has not yet reached a final conclusion in that proceeding.

12. The daytime skywave proceeding (docket No. 8333) in turn is intimately related to far broader issues concerning even more basic questions of revision of the standard broadcast allocations pattern which are under review in the clear channel proceeding (docket No. 6741).³ Under the present allocation, a total of 46 frequencies are assigned as United States clear channels. Twenty-four of these clear channels are reserved for the exclusive use at night of a single class I-A station. On the remaining 22 United States clear channels more than 1 class I-B dominant station may be assigned, such stations affording each other mutual protection through the use of directional antennas. The assignment of secondary or class II stations is permitted on all of the clear channels. On the clear channels assigned for class I-A use, only daytime class II stations are permitted; whereas on clear channels assigned for class I-B use, unlimited time class II stations affording day and night protection to the dominant class I-B stations are permitted. On April 15, 1958, the Commission issued a further notice of proposed rulemaking in docket No. 6741, inviting comments on a proposal to assign additional unlimited time stations on 12 of the 24 United States class I-A clear channels in order to improve service in certain areas. On 5 of these 12 channels new class I-B station assignments would be permitted in specified Western States with directional antennas to protect both new and existing class I stations. The proposal also contemplates that class II (secondary) stations could also use these channels at night under certain conditions. It further provides that on the other 7 of the 12 class I-A clear channels mentioned, additional class II stations would be authorized in locations where they would provide needed primary service in areas now lacking it. While no action was taken with respect to the other 12 class I-A clear channels, the Commission asserted that it will consider at a later date the advisability of authorizing the use of higher power on these channels. Comments in response to the

³Docket Nos. 6741 and 8333 were consolidated in 1947 but in 1953 were severed in order to permit separate consideration of the daytime skywave proceeding (docket No. 8333).

April 15 further notice were filed on and before August 15, 1958, and reply comments are due by September 29, 1958.

13. It is evident that the entire clear channel problem embraces the daytime skywave problem as one large facet, and that the latter in turn affects the basis on which it would be possible to approach the questions raised by the instant DBA proposal for extended hours of daytime stations. The DBA proposal contemplates an action diametrically opposed to the tentative conclusions announced by the Commission in its March 1954 proposed report and order in docket No. 8333. Thus, insofar as the instant proposal concerns daytime stations on clear channels, it could not be granted in whole or in part without having a direct bearing upon the aforementioned clear-channel and daytime-skywave proceedings, and involving a prejudgment of the issues therein. Denial of the instant proposal, of course, would not involve such prejudgment.⁴

Record in This Proceeding

14. Comments favoring the proposal were filed by the Daytime Broadcasters Association (DBA), an organization representing about 150 daytime stations, and by the licensees of over 100 daytime broadcasting stations. Oppositions were filed by the Clear Channel Broadcasting Service (an association representing 14 non-network-owned class I-A stations), the National Grange, and by the licensees of over 240 clear-channel and full-time regional stations. A large volume of correspondence from individuals and groups favoring the proposal, and a smaller quantity of informal communications opposing it, were received.

15. The proposed extended hours of operation prior to local sunrise and after local sunset by daytime-only stations would automatically involve extended hours of interference to full-time stations operating on the same frequencies.⁵ Thus, the ultimate question in this proceeding—apart from international considerations—is whether or not the public interest would be better served by permitting all daytime stations wishing to do so to broadcast during these extended hours, despite resultant interference to unlimited-time stations, or whether the public interest would be better served by retaining the present rules prohibiting the operation of daytime stations during nighttime hours. In our notice we stated that, in order to resolve this question and to evaluate adequately DBA's proposal, we needed reliable information on which to make a reasonable assessment of the probable resultant losses of service as well as a showing of the extent of the service gains which could be achieved through its adoption. Accordingly, we requested reasonably complete and accurate data concerning:

- (a) The times during which, the areas in which, and the populations for whom the DBA proposal would result in added primary service.

⁴ On August 15, 1958, WCAR, Inc., licensee of station WCAR, Detroit, Mich., filed a petition requesting that the Commission consolidate the instant proceeding with the clear channel and the daytime skywave proceeding (docket Nos. 6741 and 8333). Other parties in their comments in this proceeding also requested consolidation. For the reasons set forth in this report, and in view of our action herein, to the extent that these requests ask consolidation of dockets 6741 and 8333 with the instant proceeding, they are denied.

⁵ None of the formal comments filed in this proceeding challenged this assertion.

- (b) The extent to which such primary service gains would occur where no other primary service is available:
 - (1) from any other station;
 - (2) from any other station located in the same city or town.
- (c) The periods during which, the areas in which, and the populations for whom primary service available under the present rules would be subjected to objectionable interference to the signals of United States class I-A, I-B, unlimited-time class II and class III stations.
- (d) The extent to which the foregoing losses of service would occur in areas and for populations receiving no other primary service.
- (e) A showing similar to (c) and (d) with respect to losses of skywave service within the 0.5-mv./m., 50-percent skywave contours of class I stations.
- (f) The extent to which limitations set out in the above-referenced international agreements would be infringed.
- (g) Views of the parties concerning the need for the additional services which would be made possible by extending the hours of operation of daytime stations and the effect on the public interest of the consequent losses of service from other classes of stations.

16. The comments of DBA and the other proponents, while containing some material as to hours of operation and the communities in which daytime stations are the only local radio outlets, supply no data on areas and populations which would gain or lose service by adoption of the proposal. They urge that such data is of little use because service from distant high-power stations is not of value to local communities, even if available, because the programming of such stations is not designed for or of interest to the populations of distant communities. This argument, aimed primarily at clear channel rather than regional stations, is considered below. The opponents assert that there is great need for any data which may shed light on the probable or possible effects of the DBA proposal in terms of services to be gained or lost by the public. Many of the opponents have filed engineering statements setting forth the results of studies concerning the nature of the proposal. While most of these statements are admittedly not as comprehensive in scope and detail as the Commission's notice called for, the opponents express the view that they are nonetheless adequate to establish, for the frequencies and locations which have been studied, that severe losses in area and population now receiving interference-free nighttime primary groundwave service and secondary skywave service would result from operation of daytime-only stations beyond local sunset hours and, likewise, that interference effects suffered by daytime-only stations after local sunset would markedly reduce any gain in service by these stations.

17. Much of the data which has been filed is tabulated in summary form in the appendices attached hereto. While our consideration is by no means limited to data therein, these appendices serve as a convenient vehicle and ready reference for a substantial quantity of the technical data which has been filed in this proceeding.

18. Appendix I shows the areas and populations served by daytime stations and the service which would be afforded if these stations were authorized to operate at night after local sunset or before local sunrise. Appendix II shows the areas and populations receiving primary service nighttime from stations authorized for nighttime operation and the areas and populations which would lose this service as a result of interference under the DBA proposal. Appendix III shows the areas and populations receiving nighttime secondary service and the areas and populations which would lose this service under the DBA proposal.

19. Interference computations were made using the average sky-wave field intensity charts contained in section 3.190 of the Commission's rules, which are based on the average field intensity corresponding to the second hour after sunset. In addition, the diurnal variation curves contained in figure 5 of the Commission's exhibit 1 in docket No. 8333 were used by some parties on the basis that these curves are more appropriate for the first hour after sunset or before sunrise. Where data was supplied on both bases, the appendices show both values. We believe these field intensity charts and diurnal variation curves and the various other engineering tools and assumptions—based upon professional engineering experience—are sufficiently valid to render the data submitted by these parties of practical use to the Commission in reaching our decision herein.

We proceed to consider the seven propositions set out above.

(a) *The times during which, the areas in which, and the populations for whom the DBA proposal would result in added primary service*

20. The stations licensed for daytime operation only for which data has been filed are listed in appendix I. Although in some instances not complete, data requested by the notice herein has been filed for 81 stations. Sunrise and sunset hours for the months of March and December are shown in the appendix for each station. Thus the hours of operation requested by the petition may be determined for each station by comparing the sunrise and sunset time shown in the table with the 5 a. m. to 7 p. m. hours requested by the petition. For example, sunrise and sunset at Texas City, Texas in March is 6:30 a. m. and 6:30 p. m.; in December it is 7 a. m. and 5:15 p. m. When compared with 5 a. m. to 7 p. m., the early morning operation involved amounts to 1½ hours and evening operation for ½ hour during March and 2 hours and 1¾ hours, respectively, during December.

21. The month of March has been chosen as representative of spring and fall (October) conditions and December as representative of the conditions during the winter. In general, during summer 5 a. m. follows sunrise and 7 p. m. precedes local sunset. Thus, sunrise and sunset hours for June, as representative of summer, are not shown.

22. Disregarding the summer season, during which slight if any additional operation is involved, the additional morning hours of operation from the table range from a minimum of 1 hour during

March to a maximum of 3¼ hours during December, with an average of 1.5 hours during March and 2.4 hours during December.

23. Since the stations licensed for daytime operation only do not now operate after local sunset or before local sunrise, any primary service which would be provided by such stations during the extended hours requested by the petition would result in added primary service. The data tabulated in appendix I shows that 7,977,444 persons within 36,800 square miles would receive primary service from 50 stations on which sufficiently complete data has been supplied, based upon the interference conditions during the second hour after sunset. By way of comparison, 44,567,568 persons within 540,223 square miles receive service from these same stations during their daytime operation. Thus, these stations would, in the aggregate, afford service during the additional hours requested to 17.9% of the population and 6.8% of the area that they serve during daytime hours. For conditions during the first hour following sunset or before sunrise (2 hours of the total additional operating hours requested in the petition are under first hour conditions) the data shows that 8,421,166 persons within 20,285 square miles would receive primary service from the 24 stations for which first hour data is available. During these hours the daytime stations would serve in the aggregate 31.1% of the population of 27,100,159 and 6.1% of the area of 334,484 square miles served by the same stations during daytime hours.

(b) *The extent to which such primary service gains would occur where no other primary service is available:*

(1) *from any other station*

(2) *from any other station located in the same city or town*

24. Based on data for the entire 81 stations listed in appendix I, of the total area and population which would receive added primary service only 64,151 persons in approximately 330 square miles do not now receive primary service from any other station during nighttime hours. 1,541,153 persons in 28 communities do not receive nighttime primary service from any other station located in the same city or town in which the daytime station is located, although other nighttime primary service is available.⁶

25. The above population, area, and percentage figures are limited to the stations for which coverage data has been submitted in this proceeding. These stations comprise a minor percentage of the stations licensed for daytime operation. It is thus appropriate to consider carefully the question whether such data is adequate for our use herein. Upon careful consideration it is our view that the data is typical of all daytime stations and is thus fully adequate. The electrical interferences to the signals of the various stations, which limit their coverage, extend over great distances at night, and thus affect those stations for which no data has been filed as well as those for which data has been filed. The extent of the interference on each channel for which data was filed will be greatly increased under the operation proposed by DBA as compared to the interference now ex-

⁶ In several instances such primary service is received from the principal city of the urbanized area in which the community is located. In this connection see footnote 16 on p. 20.

isting. Such interference will prove to be at least as severe as additional stations are considered in the data. Finally, our examination extends to daytime and unlimited-time station coverages under the data which has been filed. Thus, a substantial number of stations are included, and on these our most careful evaluation convinces us that the daytime stations for which data has been filed are in no way atypical but are fully representative of all daytime stations, both those now licensed and those which may be granted in the future. While additional data could serve to provide greater detail to buttress our decision herein, and to that extent would be desirable, no additional data is necessary in order to support our conclusion herein.

26. One additional and somewhat countervailing factor is appropriate for consideration here. There are listed in appendix IV all of the cities and towns within nighttime "white areas" (i. e., areas receiving no nighttime primary service) in which daytime stations now operate. The proposed nighttime operations would afford immediate primary service to these communities to the extent that such service would not be prevented by electrical interference. It is reasonable to assume, moreover, that in most instances centrally located transmitter sites could be found which would provide service to all persons in these cities and towns.

(c) *The periods during which, the areas in which, and the populations for whom primary service available under the present rules would be subjected to objectionable interference to the signals of United States class I-A, I-B, unlimited time class II and class III stations*

27. The unlimited time stations for which primary service data has been filed are listed in appendix II. This data, although incomplete for some stations, has been filed for 169 stations.

28. The loss in the service of 132 stations based on second-hour conditions aggregates a total of 94,591,111 persons in areas totaling 1,289,827 square miles. The loss of service amounts to 43.7 percent of the populations and 68.6 percent of the areas now served at night by these stations.⁷

29. Based on first-hour conditions, the interference shown in the appendix for 24 stations for which such data is available totals 27,513,881 persons in 646,989 square miles. The loss amounts to 30.8 percent of the population and 53.9 percent of the area now served by these stations during these hours.

30. Sunrise and sunset hours are not shown in appendix II because those appearing in appendix I are considered to be more meaningful. It is from these that the extended hours of operation by daytime stations, and thus the duration of interference causing the loss of service of unlimited time stations, can be determined. Moreover, the periods during which interference would be encountered would not prove appreciably different if computed upon the basis of sunrise and sunset hours at the slightly different locations represented in appendix II, these being generally similar in geographical latitude and longitude.

⁷ The present service areas that would be lost by a number of these 132 stations overlap. Thus, while many persons would lose 2 or more services, the total population and areas which would lose 1 or more services is considerably less than the aggregate totals of 94,591,111 persons, and 1,289,827 square miles.

(d) *The extent to which the foregoing losses of service would occur in areas and for populations receiving no other primary service*

31. No data has been tabulated in the appendices showing the other primary services in the area which would lose service if the DBA proposal is adopted, since very little data on this point was submitted in this proceeding. In any event the significance of such data, if it had been tendered, would have been minimal because of the reduction in primary service by substantially all unlimited time stations which would result from adoption of the subject proposal. It is evident from appendix II that all of the unlimited-time stations on frequencies on which daytime stations are or may be licensed will lose service. The effect of these losses cannot be considered by measuring the loss of service of any one station but must be considered when all of the service losses are combined. While data has been supplied in various comments showing that substantial "white" areas would be created by loss of service from an existing station, a summation thereof has not been feasible at this time in view of the incompleteness of the data submitted. We are certain, however, that very considerable "white" area would result if the proposal were adopted.

(e) *A showing similar to (c) and (d) with respect to losses of skywave service within the 0.5-mv./m. 50-percent skywave contours of class I stations*

32. Secondary service is provided to those areas in which a skywave signal has sufficient strength to render satisfactory service and is free from interference from other stations. Under our rules only class I stations provide secondary service. Such service is considered to begin at sunset and end at sunrise the following day, coincident with the required signoff and sign-on, respectively, of the stations licensed to operate on the same channel during the daytime hours.⁸ The full coverage potential of secondary service is not realized during the first hour following sunset (or before sunrise), however, as the 50-percent-time skywave service signals increase in strength in accordance with the diurnal curve. The increase in strength and thus in service potential of these signals does not depart significantly from the increase in strength of the interfering signals governed by the same diurnal effects. The exact amount of skywave service destroyed under the DBA proposal will thus vary from day to day and from time to time in any given day because the time in which the interference occurs includes the time during which the skywave service is in the process of increasing or of decreasing. We conclude, however, that all or substantially all such service would be subjected to objectionable interference under the proposal during all nighttime hours that daytime stations would operate, particularly in view of the large number of pending applications that request operation during these hours.

33. DBA and other proponents assert that nighttime skywave sig-

⁸The exact buildup of skywave service depends both upon the increasing strength of skywave signals and the elimination of interfering signals. Sunset time for two or more daytime stations may be somewhat different for each location. Thus, a reduction of interference will be realized as each leaves the air, until the interference is entirely eliminated. During morning hours an inverse sequence is followed, each daytime station commencing operation at its own local sunrise.

nals from the clear channel stations are too weak, intermittent, and un dependable to provide service throughout large areas of the USA. These proponents urge adoption of the DBA proposal as a remedy for this asserted lack of service. However, after carefully studying the technical data submitted in comments in this proceeding, in addition to other engineering information in the Commission's files, we are of the view that the cure would be worse than the sickness, if any. The DBA plan would deprive vast populations of all secondary service without providing any replacement for most of the areas concerned. A multiplicity of skywave service is necessary for adequate secondary service due to the intermittent character of skywave transmission. The destructive effect of the proposal is only very slightly mitigated by the fact that on a few of the clear channels (such as 670 kc., 720 kc., and 1200 kc.) there would be no cochannel interference at the present time because there are no daytime-only stations assigned on these frequencies. As a specific example of the effect of the destruction of secondary service, it might be noted that in Idaho and Montana there is an area of about 7,000 square miles, containing about 10,000 persons, to which there is available no primary service and only 2 secondary services during non daytime hours. Both of these secondary services would be completely destroyed during certain hours under the proposal, leaving this area and population with no radio service whatsoever.

34. Although not in its original petition for rulemaking, DBA in its comments suggests that the Commission permit full-time stations operating with different facilities day and night to operate with their daytime facilities during the same extended hours that daytime stations are permitted to operate. Such an additional change in allocation policy would of course increase by a considerable amount the interference which would prevail during non daytime hours. Some opponents of the proposal in their engineering analyses have assumed that a grant of extended hours for daytime stations would entail a grant of the same extended hours of operation by full-time stations with their daytime facilities, and have made part of their engineering showings on that basis. In view of our disposition of the DBA proposal in this Report, we need not decide whether granting the DBA request for extended hours of operation by daytime stations would or would not necessarily require authorization of extended hours of operation by full-time stations with their daytime facilities. Our evaluation of the DBA proposal is based upon the conditions which would prevail if daytime stations operated during extended hours and full-time stations operated as they presently do with daytime facilities during daytime hours and nighttime facilities during all other hours.⁹

⁹ It might be argued that if daytime-only stations are allowed to operate during extended hours, as a matter of equity full-time stations should be allowed to operate during the same hours with their daytime facilities. On the other hand, it could also be contended that since the essence of the daytime stations' argument is service to local communities, and since by definition under the Commission's rules full-time stations adequately serve their communities with their nighttime facilities, there is not present the element of need necessary to support such a change in the rules in the case of full-time stations. In any event, it is obvious that such an additional change in the rules would materially worsen interference conditions during the non daytime hours beyond that which would occur from a grant of the proposal as to daytime stations; and, since there is no showing of such a need, the public interest would clearly not be better served by a grant of the proposal for both types of operations than by grant of the proposal for daytime stations only.