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 PERMIT EXTENDED HOURS OF BROADCASTING FOR DAYTIME STANDARD BROADCAST STATIONS.	Docket No. 12274

REPORT AND ORDER

(Adopted: September 19, 1958)

BY THE COMMISSION: CHAIRMAN DOERFER 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 inplementation 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 groundwave (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 presunrise) period during several months of the year.

Relation Between Instant Proceeding and Clear Channel (Docket No. 6741) 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

[3] Docket 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 programing 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 skywave 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, respectivley, 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.

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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.

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[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-

[8] The 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 undependable 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 nondaytime 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 nondaytime 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 nondaytime 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.

Conclusions Based Upon Technical Data Submitted

35. The tabulation (appendices I, II, and III) of the data secured in response to the various engineering matters listed in the December 19, 1957, notice demonstrates conclusively that, in view of the tremendous losses which would result to the existing radio service throughout the United States from the operations contemplated by the instant proposal as compared with the much smaller amount of new service which would be provided in some locations, the proposal fails to accord with the statutory standards governing radio broadcast services [10] and the objectives set forth in paragraph 6, above.

Explanation of Tables

36. While substantially all of the technical data which has been filed in this proceeding is tabulated in the appendices, it has not been possible to include some data. In a few instances, for example, data is not included in which only partial or fragmentary data was supplied or where the data supplied was based solely upon potential or hypothetical stations in which one or more additional stations were presumed to be licensed and operating. We do not believe that the data so filed is sufficiently consistent with the other data, and sufficiently nonspeculative, to warrant inclusion in the appendices. We also note that the data in the table is not based precisely upon the same conditions in each instance. However, such slightly disparate nature does not detract significantly from its usefulness in this proceeding.[11] Finally, we observe that the data is based upon the operation of stations now licensed for daytime operation without including any additional stations which may be licensed and without reference to the applications for new daytime stations which are now pending before the Commission. Likewise, possible nighttime operation of unlimited-time stations by using licensed daytime facilities is not reflected in the data.

Other Contentions of Proponents Re Commission's Engineering Standards

37. The DBA and other proponents have contended that the Commission's engineering standards contained in the present broadcast rules are not wholly applicable for various reasons to the nighttime operation following sunset and before sunrise envisaged by the petition. It is contended that the Commission's skywave curves (figs. 1 and 2 of sec. 3.190 of the rules) should not be used in measuring post-sunset interference conditions in the first 2 hours after local sunset and prior to local sunrise since these curves represent propagation conditions corresponding to the second hour after sunset, conditions which do not apply to the hours involved here. The term "twilight

[10] See secs. 1 and 307 (b) of the Communications Act of 1934, as amended. Sec. 1 requires that the Commission "make available, so far as possible, to all the people of the United States * * * a radio communication service."

[11] For example, some parties filing comments did not use the 50 percent exclusion method contained in the Commission's engineering standards, contending that such becomes inapplicable in view of the great number of stations which would be involved in the nighttime operations at reduced separations. We believe the effect thereof in reference to the resulting data is de minimis.

hours" is suggested by DBA to serve as a virtual substitute for the use of sunrise and sunset times in the Commission rules. DBA has supplied a table of sunrise, sunset, and astronomical twilight times for nine cities distributed throughout the central time zone. The proponents contend further with reference to figures 1 and 2 of rule 3.190 that "The data in these curves was derived on the basis of data compiled in the second hour after sunset at the *western end of the path.*" [Emphasis supplied.] From this the proponents argue that for west to east transmissions, the curves become applicable only when the time at the receiving location is somewhat later than 2 hours past sunset. Before proceeding to further discussion of the curves, it is appropriate to note that we are left with no guidance as to how the proponents' argument proceeds from "data compiled in the second hour after sunset" to the conclusion expressed in terms of "2 hours past sunset," for the two are by no means the same. As used in the Commission's standards and pronouncements, the term "second hour after sunset" means the entire 60-minute period extending from 60 minutes after sunset until 120 minutes after sunset.[12] Figure 1, used for stations operating on clear channels, is based on data corresponding to the second hour after sunset at the recording station (i. e., the receiving location). Accordingly, the curves therein represent not conditions existing at the exact period of sunset plus 120 minutes or sunrise minus 120 minutes, as might be gathered from the proponents' discussion, but instead represent average conditions existing during the second hour following sunset and the second hour before sunrise. In securing the data, automatic recordings were made of the field intensity delivered by 40 transmitting stations at 11 different points in the United States. East to west, west to east, and north to south paths were included. The curves of figure 2 used on regional and local channels are derived on the basis of data covering hourly median fields for 10 percent of the year at the western end of the path. This data, insofar as reciprocity of transmission east and west may be assumed, may equally well be interpreted as a representation of propaga-

[12] A different meaning is carried by the term "SSMP+2" which is used in the abscissa scale of the diurnal curves which appear as figs. 2 and 5 of the Commission's exhibit 1 in docket 8333 as discussed hereinbelow. This term is an abbreviation for sunset midpoint (of transmission path) plus 2 hours, i. e., plus 120 minutes. Any point SS+X on the curves is based on data for the hour centered on X hours after sunset. From a statistical viewpoint any point on the curves represents the best estimate for the hourly median field centered on the abscissa for that point. Based upon the statistical variation of the instantaneous field in intervals of an hour where the sunset interval is centered on true sun time sunset (report of committee III in preparation for the clear channel hearing, docket 6741, dated January 15, 1946), these figures present abscissa values which are designated on a linear time scale, the minimum division of which represents one-tenth of an hour or exactly 6 minutes. Lesser time increments may be read from the scale by interpolation. Figs. 2 and 5 show, respectively, a plot of the data for station WFAA as recorded in Grand Island, Nebr., over a period of approximately 6 years beginning in 1939, and curves for 0.5, 1.0, and 1.5 megacycles based upon data from 14 transmission paths recorded during these years. Diurnal curves submitted in the comments herein show slight variations from FCC data but present no conflict of decisional significance to this proceeding. Fig. 5 is appropriate for use in the manner set forth in exhibit 1 of docket 8333 and in the report of committee III in preparation for the clear channel hearing, docket 6741, dated Jan. 15, 1946. When so used, it may with substantial validity (exhibit 1, docket 8333, p. 3, line 12, et. seq.) be applied directly to fig. 2 (formerly fig. 1a) of sec. 3.190, which reflects data on curves also prepared by the above-named committee III (exhibit 109, docket 6741, p. 3, line 12, et. seq.). By this procedure, the field intensity may be determined for any hour of transmitter local time following sunset (or before sunrise) within the entire range of abscissa values shown thereon. Its use in similar manner with fig. 1 is also considered to be substantially accurate in view of the significant similarities between figs. 1 and 2. Moreover, any slight inaccuracies which may be reflected by such use are considered to be insignificantly small and thus not significant to our decision herein.

tion over the same path to the east from a transmitter located to the west. Development of this fact is made in FCC exhibit No. 1 of docket 8333, to which the petitioner has made reference. The exhibit presents "an analysis of data recorded on 14 transmission paths for a period of approximately 6 years" with the objective "to obtain curves representing '10-percent skywave field intensities' at any distance, in any direction, at any frequency, at any hour of transmitter local time for a station at any latitude." The diurnal curves, figures 2 and 5 of the exhibit, contain data concerning the variations of strength of skywave signals following sunset and thus can be used to determine the interference during the first hour after sunset (or before sunrise). It is to be observed that the diurnal curve produced by this analysis yields results of a relatively higher order of accuracy, since it involves only ratio measurements and not the absolute value of any measurement and also that the skywave curves of the Commission are accepted throughout the world as being indicative of average propagation conditions. This data is properly to be used in terms of the sunrise and sunset times used by the Commission in its rules.[13] Thus, whether or not there be "twilight" following sunset lacks significance in the face of actual measurement data concerning skywave propagation conditions during these hours.

38. These proponents' contention that the Commission's curves should not be applied to determine interference during the first 2 hours after sunset does not mean that there will be no interference effects in the 2-hour postsunset and presunrise periods or that the Commission can proceed on any such invalid assumption. Indeed, DBA and most of the proponents admit that interference will result. Furthermore, it is noted that, although the proponents in discussing interference refer to the 2-hour period after sunset and before sunrise as though they were the only periods affected by the proposal, the interference problem is not so confined, since some daytime stations would increase their broadcast hours in the morning and again in the evening to as much as 3¼ hours after sunset and before sunrise during midwinter months.

39. The proponents also contend that, since figures 1 and 2 of section 3.190 of the rules present a statistical method for predicting interference, such interference would, in fact, exist as little as 10 percent of the time. This is an oversimplification of the problem, and a misinterpretation of the significance of the 10-percent figure. Section 3.182 (o) of the Commission's rules states that objectionable interference is created by an undesired signal to a desired signal when the undesired signal exceeds an intensity, determined elsewhere in the rules, for 10 percent or more of the time. Figures 1 and 2 indicate for a specified radiation intensity and for transmission paths of varying lengths the intensities of the continuously varying skywave signal which are exceeded 10 percent or more of the time. Therefore, if the intensity of an undesired signal, as determined by the employment of figure 1 or figure 2, exceeds the permissible undesired/desired signal ratio, the undesired signal causes objectionable interference, without regard to the fact that it has less than the intensity deter-

[13] Sec. 3.79 of the Commission's rules.

mined from figures 1 or 2 for a major portion of the time, and may have completely destructive intensity for a much shorter time. The Commission has selected the 10-percent level as being a reasonable limit of interference. Ionospheric propagation, the basis of figures 1 and 2, is a subject of exceeding complexity, the study of which has occupied many capable physicists and engineers over a period of years. While interferences are predicted in standard broadcast station allocations by tools employing the statistical method, we believe that therein lies strength of these tools and that predictions of station interference based upon them are meaningful.

(*f*) *The extent to which limitations set out in international agreements would be infringed*

40. It is necessary to consider the impact of the DBA proposal on international agreements and understandings affecting allocation of standard broadcast facilities, since these agreements provide stricter limitations upon the operation of unlimited time stations than upon daytime-only stations on almost all frequencies and since they define daytime operation as operation between local sunrise and local sunset.[14] Almost 400 of the United States daytime stations are currently assigned on frequencies on which other North American governments have clear channel stations protected from interference by United States cochannel stations. This protection is accorded on the same basis as those countries protect the larger numbers of clear channels on which the United States has priority under the relevant agreements. As to channels designated in the agreements as regional channels, any nation may make use of these frequencies, subject to the conditions as to power and prevention of objectionable interference set forth in the agreements. Any country making an assignment of any facilities on a frequency must notify the other countries involved of the assignment; if another country objects thereto, it becomes the subject of negotiation under the agreements. The agreements involved are the North American Regional Broadcasting Agreement of 1950 (to which the signatory parties are Canada, Cuba, the Dominican Republic, the Bahamas and Jamaica, and the United States of America), and the agreement between the United States of America and United Mexican States, signed January 29, 1957. Pertinent provisions are found also in the executive agreement between the United States and Mexican Governments which became effective March 29, 1941, and continues in force until ratification of the successor agreement signed January 29, 1957. In both the 1950 NARBA and the 1957 United States-Mexican agreement, definite standards of protection are set up for all of these frequencies, with different standards for day and night (sunset and sunrise) operation. With respect to the class I–A channels on which the respective countries have priority, the protection extends to the border of the country, and a cochannel signal from a station in another country exceeding 5 μv./m. daytime or 25 μv./m. nighttime is prohibited. Also contained in the 1950 NARBA, with respect to such channels, is a provision that no station is to be assigned in another country for nighttime operation within 650 miles of the border of the

[14] The definition of "daytime operations" in the North American Regional Broadcasting Agreement of 1950 (annex II, sec. A (6)) is quoted in par. 18 of the December 19, 1957, notice initiating this proceeding.

country having priority; the United States-Mexican agreement of 1957 states that no nighttime assignments will be made by either country (except in the specific cases mentioned therein) on a channel on which the other country has such priority.

41. While neither the 1957 agreement with the United Mexican states nor the 1950 NARBA has yet entered into formal effect through requisite ratification by the parties,[15] the signatory governments, in the interest of avoiding chaotic mutual interference to the several broadcast services concerned are, in general practice, observing the limitations which these agreements stipulate. It is not possible, therefore, to disregard these international agreements. The Commission has so stated; in the note to section 3.28 of its rules it is provided that, pending ratification and entry into force of these agreements:

* * * no assignment for a standard broadcast station will be made which would be inconsistent with the terms of these agreements.

This policy has been uniformly applied by the Commission.

42. It is apparent that grant of the instant DBA proposal would violate the standards of protection set forth in these agreements and adhered to by the Commission, not only with respect to clear channels on which other nations have priority of use, but also with respect to regional channels. From the data submitted in this proceeding, it is readily apparent that operation by United States regional daytime stations during the nondaytime hours proposed by DBA would cause serious objectionable interference in many cases to stations in foreign countries. One example of interference which would be caused on a clear channel is seen, in connection with operation on 740 kc., a channel on which Canada has class I–A priority and station CBL, Toronto, operates as a class I–A station. Under maximum interference conditions which would prevail under the DBA proposal (7 p. m. in December), CBL would be limited, as a result of operation by United States stations on 740 kc, after sunset, to its 11.6-mv./m. contour, instead of rendering service out to its 0.5-mv./m. contour and beyond. CBL's 0.5-mv./m. groundwave contour includes all of southern Ontario between Georgian Bay and the eastern end of Lake Ontario. If limited to its 11.6-mv./m. contour the station would render primary groundwave service at 7 p. m. in December only within an area with a radius of about 40 miles around its transmitter.

43. After the issuance of the December 19, 1957, notice in the present proceeding, the Commission requested the Department of State to elicit the views of the other nations which are signatories to the above-mentioned international agreements. The reply which has been received from the Dominion of Canada voices strong opposition to the proposal because of its effect upon the primary service of all classes of stations. Mexico is of the view that the DBA proposal involves very difficult problems and it indicates that no approval of the proposal will be forthcoming in the near future. Of the other signatory countries that have replied, only Bahama, Jamaica, Cuba, and the Dominican Republic have indicated that they may not object to the proposal.

[15] To date, Canada and Cuba have ratified the North American Regional Broadcasting agreement.

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44. DBA and other proponents state that since the two agreements have not yet been ratified, the mere fact of their execution and existence is no reason to reject the DBA proposal. But this assertion ignores the fact that, though not ratified, the agreements have been of tremendous importance in affording some measure of protection to United States stations from the uncontrolled interference which could result if the United States, or other countries signatory to the agreements, gave no further consideration to their mutual commitments under such arrangements. We question whether under any circumstances we could appropriately undertake a change in our allocation policies so seriously inconsistent with international understandings, which would jeopardize the framework of mutual protection throughout the continent. We are not impelled to take such a serious step here.

(*g*) *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 the service of other classes of stations*

45. Under the provisions of section 3.24 (b) (2) of the rules, a proposed assignment which will cause objectionable interference to existing service will be permitted only when the public need for the new service clearly outweighs the need for the service which will be lost. This same principle applies in our consideration of the DBA proposal; the public interest will not be served by adopting the proposal unless the need for the service which daytime stations will render during nondaytime hours exceeds the need for the service of unlimited time stations which will be lost during such hours. In making this comparison of the relative need for the service that would be gained and lost by adoption of the proposal, we note that operation of daytime stations as contemplated by the DBA proposal would result in loss of existing service to a vastly greater population than that which would receive additional service. While this finding is a persuasive one, it would not necessarily be determinative if the need for the service which would be gained by a relatively small population were greater than the need for the presently existing service which would be lost. After carefully considering all of the comments filed in the instant proceeding (including letters from community groups and others in support of the DBA proposals, and also those portions of the record of the hearings conducted by the Select Committee on Small Business of the United States Senate in April 1957, which were incorporated by reference in some of the comments herein), we believe that such a preponderant need for the extended hours proposed by DBA is not established, but, rather, that the record shows a greater need for the preservation of service which would be lost under the proposal.

46. The proponents assert that there is a large, unsatisfied need for local service during the hours between 5 a. m. and 7 p. m. It is asserted that this need is not being met by the service rendered by distant stations because (1) with the increasing availability of closer signals, listeners are no longer content to make use of the weaker signal of a distant station for radio reception; and (2) even if the

distant station provides a technically adequate signal, its program service is not geared to the needs and interests of the local community, and does not meet them. Of particular significance, state the proponents, is the fact that in the United States 913 communities, with a total population of more than 7,500,000, have available to them no local radio outlet other than a daytime-only station.[16] It is asserted that extended hours are necessary for daytime stations in order that the needs of these communities and surrounding areas for broadcast service may be more fully met.

47. In evaluating this argument, it must be borne in mind that the absence of a local nighttime standard broadcast station in these communities (the number of 913 has not been challenged, and is accepted here) does not mean that that number of communities are without nighttime primary service. It is established by the data furnished herein that of the 913 communities, approximately 535, with a population of nearly 6,400,000 are located in areas where 0.5 mv./m. or better primary service is available nighttime.[17] The rural area around these 535 communities thus receives primary service nighttime; it cannot be determined from the data of record how many of these 535 communities (nearly all of which are of 2,500 population or more) receive by night the 2.0-mv./m. signal required for primary service to urban communities, but it appears that most of them do. Many of these 535 communities are located in metropolitan or urbanized areas, and receive primary service from stations located in the principal city thereof or in another suburban community.[18] In other cases, some of these 535 communities receive primary service nighttime from a station located in the same county. We recognize the importance of providing a local outlet for as many communities in the Nation as possible. This is one of our basic allocation objectives. Yet this objective should not be reached by changing the AM allocation rules so that an inefficient use of broadcast facilities would result therefrom.

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[16] Some of the daytime stations supporting the proposal are located not in any of these 913 communities but in cities well supplied with full-time service, including Baltimore, Los Angeles, Pittsburgh, Providence, Akron and Columbus, Ohio, and Greenville, S. C. These stations stress, in support of their request for additional hours, the unique or extraordinarily valuable character of their program service to their communities, including such matters as public-service programing and announcements; the fact that the full-time stations are all network affiliated, whereas the proponent's station would furnish an independent, locally oriented service during the extended hours; foreign-language programing; religious programing; and programing of a higher cultural character than that available in the community from the full-time stations. We conclude herein that the need for additional local service in communities now having no local nighttime outlet does not justify the result sought by DBA; a fortiori, it cannot be concluded that the proposal should be granted because of the programing characteristics of stations in communities having a full-time local outlet such as those mentioned above. Furthermore, such characteristics of programing are of course highly changeable, and therefore are not a valid reason for changing the permanent, basic allocation structure.

[17] The figure of 535 communities is contained in reply comments filed on behalf of station WING, Dayton, Ohio; it is stated that all of them have "interference-free groundwave service available at night." However, an examination of the exhibits cited in support of this assertion shows that some of the communities listed (e. g., those listed for Alabama) are over 2,500 population and receive only 0.5 mv./m. but not 2.0 mv./m. groundwave service.

[18] For example, DBA lists among the 913 communities Silver Spring and Wheaton, Md., and Alexandria, Fairfax, and Falls Church, Va., all of which are in the Washington metropolitan area. Other suburban communities listed are Glendale and Inglewood (Los Angeles); San Mateo and San Rafael (San Francisco-Oakland); Evanston (Chicago); Covington and Newport, Ky. (Cincinnati); Bossier City, La. (Shreveport); Dundalk and Towson, Md. (Baltimore); Cambridge, Medford, and Quincy, Mass. (Boston); Inkster (Detroit); Anoka, Hopkins-Edina and St. Louis Park, Minn. (Minneapolis); St. Charles and Clayton, Mo. (St. Louis); Morristown, N. J. (Newark); Campbell, Ohio (Youngstown); Massillon, Ohio (Canton); Worthington, Ohio (Columbus); Braddock, Homestead, New Kensington-Tarentum, Pa. (Pittsburgh); Prichard, Ala. (Mobile); Scottsdale, Ariz. (Phoenix-Mesa); Groton, Conn. (New London); Coral Gables, Fla. (Miami); Decatur, East Point, Ga. (Atlanta); Rossville, Ga. (Chattanooga); New Albany, Ind. (Louisville); and Council Bluffs, Iowa (Omaha).

The need for and advantages accruing from extended hours for a local outlet are expressed by the proponents as including the following more specific elements (which, it is asserted, are not met by stations located elsewhere):

(*a*) Need for service, particularly during evening and early morning hours during winter months, to convey information about bad weather and other emergency conditions. In wintertime (before sunrise) it would be desirable to have more broadcasting of school closings due to bad weather, changes in school bus routes, etc. On certain occasions daytime stations either could have rendered such service but were unable to do so because of their short hours, or rendered such service (in connection with tornadoes, etc.) in months when they were permitted to operate, but could not have done [19] so if the emergency situation had occurred at another time of year.

(*b*) Need for service to provide farm market and weather information in the evening and early morning, when farmers are able to hear it and make advantageous use of it (e. g., in connection with deciding whether or not to ship livestock). Wide-area stations, while they can and do provide agricultural information generally, cannot gear such information specifically to the needs of the local farmers in all parts of their wide and diverse areas.

(*c*) The advantage which would accrue to public-service organizations from the stations having more time to devote to public service programing and announcements. Because of the short operating hours during the months (late fall and winter) when business is good, stations must necessarily devote the bulk of their time to commercial material; some worthy causes (such as the March of Dimes) put on their drives in wintertime, when the short span of daytime operation limits the effectiveness which a station can have in supporting them.

(*d*) The general need for and advantage of providing desirable programs, such as news, at times when people are free to listen to them. During daytime hours in late fall, winter, and early spring, programs can be presented only during hours when much of the potential audience is at work, in school, or otherwise not free to listen, and that it would be preferable to be able to present such programs during the dinner hours.

(*e*) Elimination of the confusion which results from lack of uniform hours. The audience becomes confused as to when the daytime station signs on and off and during what part of the year a program will be available at a certain time. The audience tends to identify the station with its shortest hours (the only hours during which it is always available); accordingly, it is difficult to build an audience for the additional hours which become available as daytime hours increase seasonally.

[19] One specific example of this kind of service was described by station WLBH, Mattoon, Ill. On that occasion, in January 1957, a large local industrial plant was not able to go into operation in the morning because of a break in a gas main (hundreds of miles away) during the night. The plant manager called the station manager about midnight and requested that the station broadcast announcements of the event between 6 and 7 a. m. so that workers at the plant would not come to work. The station was of course unable to do so since sunrise was not until after 7 a. m., and no other station in the area was available to make the announcement.

(*f*) The difficulty of building programs at particular hours during the year and then having to cancel or shift them when daytime hours become shorter. Sponsors will buy a particular program at one hour but not at another hour (e. g., a 5 : 30 news broadcast); this results in gaining a sponsor only to lose him when the program must be canceled or shifted, and the same thing applies to the listening audience.

(*g*) Greater service to local advertisers. Local merchants are deprived of the opportunity to promote their products or services by the absence of a radio outlet during nondaytime hours, particularly during the months when business is at a high level (in particular the pre-Christmas months, October, November, and December). This works to the detriment of the local community in that it gives big city advertisers an advantage because they can advertise over full-time stations in the larger communities and appeal to the local community audience, while the local advertisers have no outlet during important listening hours. The small business concern is hurt in this respect, since the local (daytime) station is often the only medium it can afford to use.

(*h*) The desirability of the hours involved, from the standpoint of the listener, the advertiser, and the station (for example, hours up to 7 p. m. are valuable because television viewing does not reach its peak until after that hour).

(*i*) The advantage to the station, from the standpoint of both stability of staff and economy of operation, of being able to conduct its operations during generally the same hours all year, rather than (as at present) having to either support all year a staff adequate for its longest hours of operation, or hire new people for the longer hours every spring or summer.

(*j*) Advantages to the daytime-only stations, as such. The daytime stations are small business, their opportunities are limited by an archaic allocation system which at present works for the benefit of a few wide-area stations which no longer render a significant service to communities distant from where they are located. While figures may show a fair income for daytime stations as a group, a number of them are not doing well economically and would be hurt in any business recession.

(*k*) In general, the need for a medium of communication in additional hours, particularly in communities where there is no daily newspaper and where (as in a few cases) the daytime station is the only station in an area of two or more counties.

48. Many of the proponent daytime stations submitted letters from city officials, representatives of civic, educational, religious, and business groups, county agents, and similar persons, as well as from listeners, expressing views that some or all of the needs and potential advantages exist. It may be observed, in general, that these persons did not appear to be aware of the fact that during the extended hours the service area of a daytime station would be less than, and often only a small fraction of, the station's daytime service area. Some of them seem to be aware in a general way that the DBA proposal would create interference, but they do not appear to know the extent thereof.

49. We recognize that these needs and advantages of extended hours of operation by daytime stations exist insofar as they concern the public and the community rather than the station itself, and that, absent interference considerations, it would be desirable that a local outlet operate during whatever hours may be necessary to meet them. But these same needs and advantages are common to all radio service and any change in allocation rules which results in degradation of overall radio service results in less meeting of the various needs and provides for less of the advantages than at present. We recognize the importance and value of permitting the only local outlet in a community to operate during additional hours, especially where, as in the case of some of these daytime stations, the resulting additional service would be the only primary service available during the hours in question. Yet the losses in service which would result, losses often near and in some cases within the very communities which the full-time stations are licensed to serve,[20] far outweigh the gains. The losses would thus impair the present ability of stations to meet the needs and provide the advantages expected of radio to an extent much greater than that to which the extended hours would afford daytime stations an opportunity to render similar service. For example, as to service in emergencies, it is desirable for a local station to be able to render such service; but not at the expense of the ability of other stations to render similar service, when the population lost would be much greater than the population gained.[21] The same consideration applies in the case of the Commission's conelrad system. The optimum value of this system is obtained only when radio service is maintained reasonbly unimpaired.

50. With respect to service in emergencies and generally, it must be borne in mind that under the DBA proposal, while individual communities would gain some service, the nation as a whole would lose much more than it would gain. The area and population served by the daytime stations would be severely limited as compared to their daytime coverage, and the primary service rendered by full-time stations would suffer vast inroads. The result would be the curtailment of presently available primary service to large areas and populations, especially rural areas, during the hours in question.[22]

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[20] Several opponents of the proposal submitted an engineering study of the effect of the subject proposal on the coverage of a number of 5-kw., unlimited time, regional stations. The study discloses that 64 percent of these stations would not provide interference-free service to the cities for which they are licensed and that 46 percent of them would not even be able to serve the principal business districts of their communities.

[21] As some of the opponents have noted, other methods are available to bring locally originated nighttime radio services to the 913 communities now without such service. In some cases the daytime stations on regional channels and on foreign clear channels could bring a full-time service to their principal communities by installing directional antennas for nighttime operation on the same or some other frequency. Where this would not be feasible, the daytime stations might consider constructing and operating FM stations. As shown by data in the record, FM stations can give much greater coverage of the communities and surrounding areas during night hours than that obtainable from a daytime-only station subject to the limitations which would prevail. It is reasonable to assume that the public would purchase FM receivers if there is sufficient unsatisfied need for radio services in these communities.

[22] For example, a large area in New York, Pennsylvania, and New Jersey, now served by New York City, clear-channel stations with a groundwave signal nighttime of at least 0.5 mv./m.[1] would lose the service of these stations. Within this area of approximately 11,000 square miles, nearly 6,500 square miles would have no primary service available during these hours in spite of the fact that daytime-only stations would be serving very small portions of the area. Of the approximately 644,000 rural population within this area, about 323,000 would continue to receive primary service during these hours from daytime stations and existing full-time stations as limited by the additional interference; but about 321,000 persons, who now receive service from New York stations would have

51. The proponents assert that extended hours of operation are needed to permit daytime stations to carry many programs of sole or primary interest to outlying rural areas. The licensees of a number of clear-channel and unlimited-time regional stations reply: that they already provide extensive unique programing designed solely for rural listeners; that this programing has a wide appeal to farm listeners, evidenced by mail received from such listeners in all parts of their service areas; and that these programs are principally scheduled during morning and evening mealtime hours, which are presunrise and postsunset hours during winter months. The mutually destructive interference which would result from permitting all stations on regional and clear channels to operate with daytime facilities in presunrise and postsunset hours would have the effect of largely wiping out the service to rural areas of both the full-time and the daytime stations.[23] In this connection, a national organization representing rural interests, the National Grange, filed an opposition in which it stated that the instant proposal would result in a severe reduction in satisfactory radio service to millions of persons in rural areas.[24] We are of the view that, instead of greater service to rural areas, the proposal would result in markedly less service.

52. One of the cornerstones of the DBA argument is that the distant stations do not provide a useful service for communities located at some distance from them and, furthermore, now that better signals are available, listeners are not content to listen to the mediocre signal of a distant station. In short, it is urged, the allocation scheme designed to protect wide-area coverage is archaic. DBA asserts that whether a station's service is of value cannot be ascertained by technical concepts and rules, but should be determined by surveys of the extent to which the station is regularly received by listeners. DBA asserts that such surveys would show distant stations have little or no listener significance. While not advancing such data itself (a few proponents advanced very fragmentary data of this sort), DBA asserts that it is clearly within the ability of the full-time stations to do so. The interference entailed by the DBA proposal would not however, affect merely, or principally, distant stations, but would have a most serious effect upon the service of regional stations close to or even within the community to which they are assigned.

53. A number of full-time stations, both clear channel and regional, made showings that their programing which was specifically geared to outlying communities and rural areas within their service contours. This programing includes agricultural programs, civic programs for each community and local sporting events. The Clear Channel Broadcasting Service (CCBS), in its comments filed on August 15, 1958,

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available to them no nighttime primary service from any source. Similarly, around Greenville, S. C., operation by daytime stations under the DBA proposal would cause severe losses to full-time Greenville stations during postsunset hours. Daytime stations would serve portions of this area, and also additional adjacent areas not now receiving primary service during postsunset hours. The record also discloses that "white" area would be similarly created around Dallas, Omaha, Salt Lake City, Phoenix, and other cities.

[23] As an example of this loss of rural service, the licensee of station KSAL, Salina, Kans., asserts that 35 cities and towns and extensive rural area encompassing all of 5 counties and parts of other counties, now served at night by KSAL and by 2 other stations, would lose all primary nighttime service.

[24] Another national farm organization, the National Council of Farm Cooperatives, while not taking a firm position opposing the proposal, asks that the Commission carefully consider its possible adverse effect upon rural listeners.

in the clear channel proceeding (docket No. 6741), submitted mail response tabulations of its member stations to show that large numbers of persons living great distances from clear channel stations listen to the nighttime skywave signals of these stations. This data reveals the following mail response for the listed clear channel stations, each of which elicited such response from its listeners by announcements made during periods of up to 2 weeks during the month of June 1958: [25]

Station and location	Dates announcements made in June 1958	Mail response from secondary service area only (i. e., beyond nighttime groundwave contour)
WSM, Nashville, Tenn	20–28	718 counties in 36 States.
WLW, Cincinnati, Ohio	24–27	138 counties in 24 States.
WGN, Chicago, Ill	17–25	290 counties in 34 States.
WWL, New Orleans, La	9–22	476 counties in 32 States.
WHO, Des Moines, Iowa	20–27	100 counties in 27 States.
WOAI, San Antonio, Tex	23–27	289 counties in 26 States.

Storer Broadcasting Co., in its reply comments filed in this proceeding, tabulated the mail received from listeners of its class I–B station WWVA, Wheeling, W. Va., in the month of April 1958. During that month mail was received from 41 States. Fifty-six percent of the mail was received from States located entirely outside of the primary groundwave service contour of WWVA. In sum, no data of which the Commission is aware, shows or tends to show that the listening habits of the Nation have changed in such a way that distant stations should no longer be protected or daytime stations be permitted to operate in spite of the resultant interference of the magnitude involved here.

54. Some proponents contend that extended hours for daytime broadcasters should be considered as a means for improving the capacity of daytime broadcasters as "little business" to compete with other, bigger stations. It would not be realistic, however, to treat the proposal in this light. Extended hours for daytime stations would adversely affect numerous other small broadcasters, including small unlimited time stations whose service areas and populations reached would be drastically curtailed by interference caused by extended hours of operation of daytime stations. Moreover, apart from the fact that the proposal does not involve a simple conflict between smaller broadcasters on the one side and bigger broadcasters on the other, we cannot lose sight of the primary basis on which the Commission is called upon to assess the effect of the proposal on the public interest; that is, its effect on services provided to the public. In this respect the evidence overwhelmingly establishes that adoption of the proposal would permit highly circumscribed increases in service by daytime stations at the prohibitive cost of destroying service now rendered to many millions of people by numerous other stations, both large and small.

[25] The CCBS comments in docket No. 6741 also include listener data for other member stations. Since these other stations, however, obtained mail from listeners in response to announcements made over extended periods of time, instead of only during a short period in June 1958, they are not included in this tabulation.

Operation Under 3.87 as a Precedent for the DBA Proposal

55. A number of the proponents claim that operation as contemplated by the subject proposal has already proved workable by the practice under section 3.87 of the Commission's rules, which permits all stations except certain class II stations to begin operation with their daytime facilities at 4 a. m., unless undue interference is caused thereby to full-time stations. It is asserted that relatively few complaints about interference have been received in connection with such operations, indicating an absence of substantial objectionable interference. We are of the opinion that this situation affords no basis for favorable consideration of the DBA proposal. The fact that few complaints have been received is doubtless a reflection of the fact that many full-time stations do not go into operation until some time after 4 a. m. and interference conditions are thereby minimized; whereas the DBA proposal would permit nighttime operation by daytime stations in the early evening when all full-time stations are in operation, and would therefore result in interference of the vast magnitude already discussed. Legally, the DBA proposal is substantially different from the present 3.87 situation because the latter is a privilege which may be canceled immediately by the Commission upon a showing of undue interference by a full-time station, while the DBA proposal would confer the privilege of nondaytime operation upon daytime stations as a matter of right, regardless of interference which would be caused.

CONCLUSIONS

56. Amendment of the rules as proposed by the DBA would not serve the public interest. The population which would gain service during these hours is vastly exceeded by the population which would lose the service of existing stations because of the additional interference which would result on all but a few of the 107 standard broadcast frequencies from the operation of daytime stations during the nondaytime hours (before sunrise and after sunset) contemplated by the proposal. The daytime stations so operating during nondaytime hours would generally serve only a very small fraction of the areas and populations which they serve during daytime hours, a fact which would sharply limit the gains in service which would result. As a result of the additional interference so created, clear-channel, unlimited-time, class II and class III stations would be limited in service so that in many instances they could not serve even all of the communities to which they are assigned. While a first nighttime primary service would be afforded to some population during these hours, and a first local service would be afforded to more than 900 communities in the Nation, extensive "white areas," in which the population would lose all nighttime primary service would be created. On virtually all of the clear channels all secondary service would be destroyed. Because of this destruction of secondary service (the only service received by some 20 million persons in about one-half of the area in the United States) and vast impairment of primary service during the hours involved, service to rural areas would be lost. Severe interference to foreign stations, inconsistent with international under-

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standing, would occur. We cannot conclude that, on balance, we are warranted in extending the proposed service. With respect to aspects of radio such as service in emergencies, this is a function of all broadcast service, and any overall degradation of broadcast service must necessarily create greater needs in these respects than those it fulfills. As to the argument that the gained local service would be of value to the local population, whereas the lost service from distant stations is of no consequence to the populations who would lose it, the record shows that the service lost would not be solely or principally that of distant stations but would occur close to the communities where such stations are located as well as at greater distances. Moreover, the record shows that many full-time stations, both clear and regional, program for the outlying communities which would lose service. Other arguments advanced, such as the economic interests of daytime stations and small communities and the precedent said to be afforded by the practice under section 3.87 of the rules, have been dealt with above. We are therefore persuaded that DBA's proposal would not serve the public interest and must be denied.

57. In view of the foregoing, *It is ordered*, That the above-captioned petition of Daytime Broadcasters Association, Inc., *Is denied*, and this proceeding *Is terminated.*

CONCURRING STATEMENT OF COMMISSIONER CROSS

I concur with the conclusion that the petition to permit all daytime standard broadcast stations to operate from 5 a. m. or sunrise, whichever is earlier, to 7 p. m. or sunset, whichever is later, should be denied. I reach this conclusion with regret because I recognize the desirability of enabling daytime stations to give longer hours of service to their communities. This is particularly evident in the case of daytime stations serving communities without local unlimited-time standard broadcast stations. Careful analysis and evaluation of the record of this proceeding discloses, however, that such limited additional service as might be made possible under the proposed rule amendment could be achieved only at the excessive cost of creating vast new interference areas and the destruction of service to a disproportionately large number of people, as set out in detail in the Commission's report and order.

APPENDIX I

DAYTIME-ONLY STATIONS

Issues (a) and (b)

Station	Present daytime service		Service during proposed additional hours [1]				Time of sunrise and sunset [3]
	Population	Area (miles)[2]	Population	Percent of present population	Area	Percent of present area	
560 kc.: WOOF, Dothan, Ala.	662,136	20,481	81,773	12	1,452	7	6:00–5:45 6:30–4:45 Same
570 kc.: WVMI, Biloxi, Miss.	313,497	7,210	36,053	12	64	.9	6:00–6:00 6:45–5:00 Same
620 kc.: WCAY, Cayce, S. C.	282,404	4,060	24,392	9	30	.7	6:30–6:30 7:30–5:15 Other
630 kc.: WAVU, Albertville, Ala.	329,574	(4)	23,307	7	-------	-------	6:00–5:45 6:45–4:30 None
640 kc.:							
WNAD, Norman, Iowa [1]	2,292,204 2,292,204	75,904 75,904	490,285 627,459	21 27	6,670 11,120	9 15	6:45–6:30 7:30–5:15 Same
WOI, Ames, Iowa [1]	1,201,725 1,201,725	48,848 48,848	275,880 368,690	23 31	843 2,085	2 4	6:30–6:15 7:30–4:45 Other
650 kc.: KRCT, Pasadena, Tex.[1]	1,012,178 1,012,178	13,054 13,054	24,605 81,544	24 81	33 105	.1 .1	6:30–6:30 7:30–5:30 Other
660 kc.:							
WESC, Greenville, S. C.[1]	674,000 674,000	10,320 10,320	103,000 108,000	15 16	120 200	1 2	6:45–6:30 7:30–5:15 Same
KSKY, Dallas, Tex.[1]	1,753,000 1,753,000	36,050 36,050	681,000 719,000	39 41	2,200 2,690	6 8	6:45–6:30 7:30–5:15 Same
KOWH, Omaha, Nebr.[1]	1,068,000 1,068,000	30,800 30,800	337,000 345,000	32 32	710 790	2 3	6:45–6:30 7:45–5:00 Same
680 kc.: KOMW, Omak, Wash.[1]	43,700 43,700	8,660 8,660	4,900 8,900	11 20	100 430	1 5	6:15–6:00 7:45–4:00 None
690 kc.: WAPE, Jacksonville, Fla.	697,856	18,373	42,373	6	423	2	6:45–6:30 7:15–5:30 Same
740 kc.: KBIG, Avalon, Calif.[1]	5,093,309 5,093,309	7,210 7,210	1,667 1,693	.1 .1	20 31	.3 .4	6:00–6:00 6:45–4:45 Other
750 kc.:							
WBMD, Baltimore, Md.[1]	1,409,792 1,409,792	5,558 5,558	442,336 900,179	31 64	56 187	1 3	6:15–6:15 7:15–4:45 Same
KSEO, Durant, Okla.[1]	399,843 399,843	18,713 18,713	11,624 12,387	3 3	30 64	.2 .3	6:30–6:30 7:30–5:15 Other
WPDX, Clarksburg, W. Va.[1]	336,309 336,309	3,425 3,425	24,795 46,387	8 14	39 171	1 5	6:30–6:30 7:30–5:00 Same
760 kc.: WCPS, Tarboro, N. C.[1]	217,122 217,122	2,922 2,922	11,273 14,300	5 7	30 99	1 3	6:15–6:15 7:15–5:00 Other
790 kc.: WSIG, Mount Jackson, Va.	-------	-------	4,136	-------	-------	-------	6:30–6:15 7:30–5:00 Other
810 kc.:							
WCEC, Rocky Mount, N. C.	-------	-------	23,336	-------	31	-------	7:00–5:45 7:15–5:00 Same
WEDO, McKeesport, Pa.	-------	-------	105,769	-------	30	-------	6:30–6:30 7:30–5:00 Same
WIPA, Annapolis, Md.	-------	-------	19,592	-------	9	-------	6:15–6:15 7:15–4:45 Same
WKBC, North Wilkesboro, N. C.	-------	-------	10,577	-------	33	-------	6:30–6:30 7:30–5:15 Same

See footnotes at end of table.

APPENDIX I—Continued

DAYTIME-ONLY STATIONS—continued

Issues (a) and (b)—Continued

Station	Present daytime service		Service during proposed additional hours [1]				Time of sunrise and sunset [3]
	Population	Area (miles) [2]	Population	Percent of present population	Area	Percent of present area	
820 kc.: [4]							
WAIT/WCBD, Chicago, Ill.[1]	5,724,707	16,778	1,541,971	27	558	3	6:15–6:00
	5,724,707	16,778	3,315,905	58	1,070	6	7:15–4:30
							Same
WIKY, Evansville, Ind.[1]	382,451	6,164	72,937	19	25	.4	6:00–6:00
	382,451	6,164	143,884	38	105	2	7:00–4:30
							Same
WOSU, Columbus, Ohio	1,779,379	21,690	506,038	28	539	25	6:45–6:45
							7:45–5:15
							Same
840 kc.:							
WKNB, New Britain, Conn.[1]	647,414	2,290	84,626	13	43	2	6:00–6:00
	647,414	2,290	230,160	36	191	8	7:15–4:15
							Same
WVPO, Stroudsburg, Pa.[1]	92,662	1,134	9,861	11	6	.5	6:15–6:00
	92,662	1,134	16,885	18	38	3	7:15–4:30
							Other
890 kc.:							
KBYE, Oklahoma City, Okla.	----------	----------	170,710	-------	132	-------	6:45–6:30
							7:30–5:15
							Same
WHNC, Henderson, N. C.	----------	----------	15,750	-------	30	-------	7:30–7:15
							8:15–6:00
							Same
910 kc.:							
WPLA, Plant City, Fla.	----------	----------	22,129	-------	158	-------	6:45–6:30
							7:15–5:30
							Other
WLAS, Jacksonville, Fla.	----------	----------	10,683	-------	885	-------	6:15–6:15
							7:15–5:00
							Same
WAVL, Apollo, Pa.	----------	----------	42,199	-------	181	-------	6:30–6:30
							7:30–5:00
							Other
WHYE, Roanoke, Va.	----------	----------	103,089	-------	78	-------	6:30–6:30
							7:30–5:00
							Same
WHSM, Hayward, Wis.	----------	----------	2,116	-------	51	-------	6:15–6:15
							7:45–4:15
							Other
920 kc.: KTLW, Texas City, Tex.	1,132,830	13,120	29,340	3	105	.8	6:30–6:30
							7:00–5:15
							Other
930 kc.: WMGR, Bambridge, Ga.	----------	----------	----------	-------	-------	5	6:45–6:45
							7:30–5:45
							None
970 kc.: WRCS, Ahoskie, N. C.	----------	----------	2,470	-------	20	-------	6:15–6:15
							7:15–5:00
							None
980 kc.: KLEA, Shreveport, La.	616,156	15,352	168,852	27	369	2	6:30–6:15
							7:15–5:15
							Same
1040 kc.: KIXL, Dallas, Tex.[1]	1,441,149	21,353	300,986	21	141	.7	6:45–6:30
	1,441,149	21,353	540,095	37	394	2	7:30–5:15
							Same
1070 kc.: WHPE, High Point, N. C.	829,349	28,022	24,302	3	22	.1	6:30–6:30
							7:30–5:00
							Same
1090 kc.: KNWS, Waterloo, Iowa	338,274	9,205	5,885	2	25	.3	6:30–6:15
							7:30–4:30
							Same
WCRA, Effingham, Ill.	113,188	3,990	9,071	8	95	2	6:00–6:00
							7:00–4:30
							Other
WILD, Boston, Mass.	1,865,111	1,345	98,425	5	7	.5	6:00–5:45
							7:00–4:15
							Same
WMUS, Muskegon, Mich.	141,540	985	56,228	40	77	8	7:00–6:45
							8:15–5:15
							Same

See footnotes at end of table.

APPENDIX I—Continued

DAYTIME-ONLY STATIONS—continued

Issues (a) and (b)—Continued

Station	Present daytime service		Service during proposed additional hours [1]				Time of sunrise and sunset [3]
	Population	Area (miles) [2]	Population	Percent of present population	Area	Percent of present area	
1120 kc.:							
KCLE, Cleburne, Tex. [1]	186,218	6,741	5,957	3	27	.4	6:45–6:30
	186,218	6,741	14,371	7	53	.8	7:30–5:30
							Other
WWOL, Buffalo, N. Y. [1]	964,485	3,192	173,667	18	78	2	6:30–6:15
	964,485	3,192	503,497	52	187	6	7:45–4:45
							Other
WUST, Bethesda, Md. [1]	826,419	716	18,006	22	9	1	6:15–6:15
	826,419	716	38,194	47	21	3	7:15–4:45
							Same
1140 kc.: WSIV, Peking, Ill		6,800			37	.5	6:15–6:00
							7:15–4:30
							Other
1150 kc.:							
WCHF, Chippewa Falls, Wis.	179,056	5,182	17,389	10	158	3	6:15–6:15
							7:30–4:30
							Other
WTYC, Rock Hill, S. C	172,151		21,753	13			6:30–6:30
							7:30–5:15
							Same
1160 kc.: WJJD, Chicago, Ill	6,409,837	22,735	1,139,602	18	20,150	89	6:15–6:00
							7:15–4:30
							Same
1170 kc.: WLBH, Mattoon, Ill	111,659	2,870	37,468	33	400	14	6:00–6:00
							7:00–4:30
							Other
1210 kc.:							
WADE, Wadesboro, N. C. [1]	84,420	1,446	3,974	5	11	.1	6:15–6:30
	84,420	1,446	4,238	5	17	.1	7:15–5:15
							Other
WAVI, Dayton, Ohio [1]	599,182	2,816	91,453	16	11	.1	6:45–6:45
	599,182	2,816	246,461	41	26	.1	7:45–5:15
							Same
WCNT, Centralia, Ill. [1]	189,825	5,720	20,684	11	88	2	6:15–6:00
	189,825	5,720	24,600	13	132	3	7:00–4:30
							Other
WKNX, Saginaw, Mich. [1]	460,045	4,670	101,378	22	36	1	6:45–6:45
	460,045	4,670	107,737	23	79	2	8:00–5:00
							Same
1250 kc.: WLEM, Emporium, Pa	17,174	1,177	3,947	23	22	2	6:30–6:15
							7:30–4:45
							Same
1260 kc.: WJBL, Holland, Mich			7,047		13		7:00–6:45
							8:15–5:15
							Same
1280 kc.: WQIK, Jacksonville, Fla.			138,636		61		6:45–6:30
							7:15–5:30
							Same
1290 kc.: WTRN, Tyrone, Pa			10,333		36		6:30–6:15
							7:30–4:45
							Same
1300 kc.: WCKI, Greer, S. C		693	2,329		14		6:45–6:30
							7:30–5:15
							Other
1320 kc.:							
WHIE, Griffin, Ga			4,524		11	.2	6:45–6:45
							7:30–5:30
							Same
WLLY, Richmond, Va		1,017	77,700				6:30–6:15
							7:15–5:00
							Same
1330 kc.:							
KDOK, Tyler, Tex	167,568	3,850	42,337	25	85	2	6:30–6:30
							7:15–5:15
							Same
WANT, Fort Pierce, Fla			12,473				6:30–6:45
							7:00–5:30
							Same

See footnotes at end of table.

APPENDIX I—Continued

DAYTIME-ONLY STATIONS—continued

Issues (a) and (b)—Continued

Station	Present daytime service		Service during proposed additional hours [1]				Time of sunrise and sunset [3]
	Population	Area (miles) [2]	Population	Percent of present population	Area	Percent of present area	
1380 kc.:							
KLIZ, Brainerd, Minn	35,500	1,676	13,186	37	31	19	6:30–6:15 8:00–4:30 Other
WAYZ, Waynesboro, Pa	107,442	909	12,916	12	20	3	6:30–6:15 7:30–4:45 None
1390 kc.: BP–11326, Albany, Ky	54,279	1,545	6,897	13	11	.7	6:00–5:45 6:45–4:30 Other
1420 kc.: WACT, Tuscaloosa, Ala	106,870	1,791	37,290	35	43	3	6:00–6:00 6:45–4:45 Other
1430 kc.: KSIJ, Gladewater, Tex		3,118			43	1	6:30–6:30 7:15–5:15 Other
1460 kc.:							
WFMH, Cullman, Ala			13,654				6:00–6:00 6:45–4:45 Same
WOCH, Mount Vernon, Ind			10,333		36		6:00–6:00 7:00–4:30 Other
1480 kc.: WYZE, Atlanta, Ga			224,689				6:45–6:45 7:30–5:30 Same
1510 kc.:							
KCTX, Childress, Tex	53,484	6,605	9,189	17	139	2	6:45–6:45 7:30–5:30 None
KIMO, Independence, Mo	905,687	6,335	720,900	80	556	9	6:30–6:30 7:30–5:00 Other
KSTV, Stephenville, Tex	48,887	3,520	4,051	8	31	.9	6:45–6:45 7:30–5:30 Other
WAUK, Waukesha, Wis	439,840	1,732	4,406	1	12	.7	6:00–6:00 7:15–4:15 Other
WKAI, Macomb, Ill	58,406	1,979	11,369	20	50	3	6:15–6:15 7:15–4:45 None
1560 kc.:							
WTNS, Coshocton, Ohio			14,429				6:45–6:30 7:45–5:00 Other
WTOD, Toledo, Ohio			47,226				6:45–6:45 8:00–5:00 Same
1600 kc.: WONG, Oneida, N. Y		2,642			72	3	6:15–6:00 7:30–4:30 Same

[1] Nighttime service under proposal: Where 2 sets of figures are shown, the upper set applies to the 2d hour of operation following sunset (or before sunrise) and the lower set applies to the 1st hour of operation following sunset.

[2] Time of sunrise and sunset: Sunrise and sunset time in local standard time for March (representative of spring and fall) is indicated by the upper set of figures and for December (representative of midwinter) by the lower set of figures in each instance. During most summer months sunrise occurs before 5 a. m. and sunset occurs after 7 p. m.

[3] Present nighttime primary service to the community: Primary service from another station located in the same city or town is shown as "Same," from another station not in the same city or town as "Other," and from no other station as "None."

[4] A blank space indicates that the data is not now available.

APPENDIX II

UNLIMITED-TIME STATIONS

Issues (c) and (d)

Station	Present nighttime primary service		Loss of nighttime primary service under proposal [1]			
	Population	Area (miles)[2]	Population	Percent of present population	Area	Percent of present area
540 kc.: KFMB, San Diego, Calif.			21,074		307	
560 kc.:						
KFDM, Beaumont, Tex.	1,195,152	10,481	766,742	64	6,798	65
KLZ, Denver, Colo.			[3]	[3]	[3]	[3]
WFIL, Philadelphia, Pa.	3,690,477	2,969	197,455	6	1,008	34
WIND, Chicago, Ill.	6,059,065	4,029	968,460	16	2,274	59
WIS, Columbia, S. C.	226,100	1,940	91,000	40	1,485	76
WQAM, Miami, Fla.	516,353	1,366	85,259	16	1,020	75
570 kc.:						
KLAC, Los Angeles, Calif.			1,749,551		1,058	
KVI, Seattle, Wash.		5,480			2,860	52
WFAA, Dallas, Tex.	1,532,981	19,700	411,563	27	13,905	71
WKBN, Youngstown, Ohio	906,053	3,858	453,085	50	2,183	57
WNAX, Yankton, S. Dak.	459,000	6,530	134,900	29	2,950	45
WSYR, Syracuse, N. Y.	549,860	2,825	139,120	25	1,275	45
580 kc.:						
KMJ, Fresno, Calif.		16,042			14,273	89
WDBO, Orlando, Fla.	190,710	2,490	80,190	41	1,500	60
WIBW, Topeka, Kans.	574,704	21,198	147,603	26	5,508	26
WTAG, Worcester, Mass.	420,736	8,408	86,248	21	2,582	31
590 kc.: WOW, Omaha, Nebr.	1,608,078	44,378	1,160,559	72	40,655	92
600 kc.:						
WCAO, Baltimore, Md.	1,334,190	1,400	107,560	8	810	58
WREC, Memphis, Tenn.[1]	933,161	10,710	407,770	44	8,520	80
	986,393	12,200	367,833	37	8,600	70
WSJS, Winston-Salem, N. C.	355,360	1,220	68,160	19	430	35
620 kc.:						
KTAR, Phoenix, Ariz.		18,815			16,374	88
WSUN, St. Petersburg, Fla.	544,215	3,424	104,717	19	1,678	49
WTMJ, Milwaukee, Wis.	1,947,197	9,155	565,889	29	4,265	47
630 kc.:						
KOH, Reno, Nev.		2,900			1,904	66
WPRO, Providence, R. I.	818,542		106,089	12		
640 kc.: KFI, Los Angeles, Calif.[1]	5,485,039	35,206	183,425	3	17,445	50
	5,485,039	35,206	134,642	3	13,741	39
650 kc.: WSM, Nashville, Tenn.[1]	1,783,166	36,869	776,273	43	21,396	58
	1,783,166	36,869	574,031	32	15,998	43
660 kc.: WRCA, New York, N. Y.[1 2]			6,091,000		49,100	
			4,685,000		31,700	
680 kc.:						
KNBC, San Francisco, Calif.[1 2]	4,416,000	107,100	715,000	16	84,900	79
	4,416,000	107,100	437,000	10	67,700	62
WCBM, Baltimore, Md.	1,225,046	501	53,252	4	236	47
690 kc.: WTIX, New Orleans, La.	713,843	2,026	168,373	24	1,726	85
710 kc.:						
KGNC, Amarillo, Tex.	223,350	13,373	[3]	[3]	[3]	[3]
KMPC, Los Angeles, Calif.			[3]	[3]	[3]	[3]
WHB, Kansas City, Mo.	848,632	3,843	[3]	[3]	[3]	[3]
740 kc.:						
KCBS, San Francisco, Calif.[1]	3,268,035	14,588	538,941	17	9,606	68
	3,288,221	15,273	398,628	12	8,189	54
KRMG, Tulsa, Okla.	309,131	2,167	92,448	30	1,373	63
750 kc.: WSB, Atlanta, Ga.[1]	1,366,803	321,796	800,282	59	20,333	6
	1,366,803	321,796	744,920	55	19,243	6
760 kc.: WJR, Detroit, Mich.[1]	9,045,957	54,402	4,421,630	49	42,210	78
	9,045,957	54,402	2,107,158	23	29,032	54
770 kc.: WABC, New York, N. Y.[2]		57,295			51,045	89
790 kc.:						
WEAN, Providence, R. I.	776,780	1,020	339,355	44	802	79
WMC, Memphis, Tenn.	605,693	3,040	123,901	20	2,268	81
WTAR, Norfolk, Va.	631,903	1,720	187,721	30	1,228	72
810 kc.: WGY, Schenectady, N. Y.[2]	4,790,983	79,046	4,123,008	86	75,983	96
820 kc.: WFAA/WBAP, Dallas-Fort Worth, Tex.[1]	3,727,792	124,356	2,004,171	54	99,292	80
	3,727,792	124,356	1,607,085	43	85,952	69
840 kc.: WHAS, Louisville, Ky.[1]	4,161,045	57,708	2,941,639	71	47,036	81
	4,161,045	57,708	1,754,601	42	37,740	65
850 kc.: KOA, Denver, Colo.	200,320		183,870	92		

See footnotes at end of table.

APPENDIX II—Continued

UNLIMITED-TIME STATIONS—continued

Issues (c) and (d)—Continued

Station	Present nighttime primary service		Loss of nighttime primary service under proposal [1]			
	Population	Area (miles)[2]	Population	Percent of present population	Area	Percent of present area
890 kc.: WLS, Chicago, Ill.[2]	10,883,382	143,634	5,278,339	49	134,296	94
910 kc.:						
KPHO, Phoenix, Ariz.	283,120	3,500	31,160	11	2,170	62
WGAF, Valdosta, Ga.			5,197		47	
WFDF, Flint, Mich.	268,433	759	18,293	7	339	45
WABE, Bangor, Maine			(4)	(4)	(4)	(4)
WGBI, Scranton, Pa.		315			161	51
WHAY, New Britain, Conn.			40,953		22	
WJHL, Johnson City, Tenn.	62,132	290	18,718	30	188	65
WORD, Spartanburg, S. C.			7,300		33	
WRNL, Richmond, Va.	265,620	320	83,570	32	175	55
WPBF, Middletown, Ohio			30,322		80	
WSBA, York, Pa.			74,139		164	
920 kc.:						
KARK, Little Rock, Ark.	234,760	790	57,050	24	430	54
WJAR, Providence, R. I.	800,000	610	346,500	43	440	72
930 kc.:						
WBEN, Buffalo, N. Y.	1,176,959	2,898	245,056	21	2,352	81
WFMD, Frederick, Md.	23,270	90	1,770	8	37	59
WIST, Charlotte, N. C.	161,050	210	49,260	30	160	76
WJAX, Jacksonville, Fla.	298,878	1,146	118,008	43	953	83
WKY, Oklahoma City, Okla.[1]	956,641	19,750	556,084	58	17,310	86
	782,947	14,050	303,262	39	9,050	64
WTAD, Quincy, Ill.	93,219	1,189	44,873	48	1,021	86
950 kc.:						
KPRC, Houston, Tex.	1,079,587	11,800	392,154	36	10,846	92
WWJ, Detroit, Mich.	3,013,096	3,435	1,572,250	52	2,844	83
960 kc.:						
KMA, Shenandoah, Iowa		3,090			5,899	63
WELI, New Haven, Conn.	270,400	216	98,800	37	174	80
WSBT, South Bend, Ind.	207,758	267	43,896	21	173	65
970 kc.:						
KBEE, Modesto, Calif.		428			194	45
KOIN, Portland, Oreg.	737,801	2,416	107,055	15	1,469	62
WAVE, Louisville, Ky.	655,608	2,895	295,380	45	2,773	96
WCSH, Portland, Maine	219,024	760	67,731	31	620	82
WDAY, Fargo, N. Dak.	519,000	30,484	434,000	84	28,648	94
WFLA, Tampa, Fla.	394,318	891	119,742	30	611	69
WWSW, Pittsburgh, Pa.	1,400,397	623	419,206	30	473	76
980 kc.:						
KMBC, Kansas City, Mo.	1,186,054	8,695	350,046	30	6,685	77
WILK, Wilkes Barre, Pa.	212,669	105	62,928	30	37	35
WRC, Washington, D. C.[1]			370,700		720	
			191,400		630	
1020 kc.: KDKA, Pittsburgh, Pa.[1 2]	6,604,000	72,200	4,362,000	66	69,025	96
	6,604,000	72,200	3,242,000	49	64,150	89
1030 kc.: WBZ, Boston, Mass.[1 2]	7,981,000	41,230	4,708,000	59	38,116	93
	7,981,000	41,230	435,000	6	37,100	90
1040 kc.: WHO, Des Moines, Iowa[1]	2,455,913	77,867	1,656,475	67	61,720	80
	2,455,913	77,867	1,289,947	53	51,935	67
1050 kc.: WGMG, New York, N. Y.[1]	12,258,433	2,110	2,398,191	20	1,199	57
	12,258,433	2,110	2,135,278	17	1,116	53
1060 kc.:						
WRCV, Philadelphia, Pa.[1 2]			1,617,000		10,100	
			350,000		1,500	
WWDC, Washington, D. C.	1,117,111	289	625,046	56	226	56
1070 kc.: WIBC, Indianapolis, Ind.	540,985	751	22,349	4	213	29
1090 kc.:						
KTHS, Little Rock, Ark.	588,104	16,740	307,873	52	14,995	90
WBAL, Baltimore, Md.	2,182,308	9,763	909,501	42	8,910	92
1100 kc.: KYW, Cleveland, Ohio.[1 2]	8,578,000	89,200	5,510,000	64	82,330	92
	8,578,000	89,200	4,986,000	58	77,220	87
1120 kc.: KMOX, St. Louis, Mo.[1]	2,751,702	35,066	763,443	28	25,474	73
	2,751,702	35,066	625,380	23	21,980	63
1130 kc.: WDGY, Minneapolis, Minn.	1,029,846	1,619	229,361	22	1,410	87
1140 kc.: WRVA, Richmond, Va.	1,087,379	9,610	462,983	43	7,490	78

See footnotes at end of table.

APPENDIX II—Continued

UNLIMITED-TIME STATIONS—continued

Issues (c) and (d)—Continued

Station	Present nighttime primary service		Loss of nighttime primary service under proposal [1]			
	Population	Area (miles)[2]	Population	Percent of present population	Area	Percent of present area
1150 kc.:						
KSAL, Salina, Kan.	115,704	5,233	77,212	67	3,940	75
WCOP, Boston, Mass.	1,864,380	330	779,720	42	240	73
WDEL, Wilmington, Del.		305,383			154,039	50
WISN, Milwaukee, Wis.	969,809	860	162,498	17	677	79
1160 kc.: KSL, Salt Lake City, Utah.	619,229	45,114	101,814	16	26,265	58
1170 kc.:						
KSTT, Davenport, Iowa.	219,117	760	43,200	20	494	65
KVOD, Tulsa, Okla.	1,244,920	41,346	476,720	39	27,263	66
WCOV, Montgomery, Ala.	127,602	669	4,691	37	187	28
WWVA, Wheeling, W. Va.	2,933,953	16,222	2,523,042	86	13,454	82
1190 kc.:						
KEX, Portland, Oreg.[1 2]	1,261,000	2,800	504,000	40	24,790	89
	1,261,000	2,800	439,000	35	21,800	78
WOWO, Fort Wayne, Ind.[1 2]	5,426,000	88,140	4,173,000	77	67,540	77
	5,426,000	88,140	4,068,000	75	66,430	75
1210 kc.: WCAU, Philadelphia, Pa.[1]	4,976,314	11,380	1,693,316	34	10,002	88
	4,976,314	11,380	1,345,703	27	9,150	80
1250 kc.: WCAE, Pittsburgh, Pa.	1,628,238	989	501,698	31	802	82
1260 kc.:						
WEZE, Boston, Mass.	2,123,425	695	697,950	33	516	74
WFBM, Indianapolis, Ind.	642,451	2,739	355,293	55	2,428	89
WWDC, Washington, D. C.[1]	1,117,111	289	625,046	56	226	78
	1,117,111	289	139,197	13	126	44
1270 kc.:						
KFJZ, Fort Worth, Tex.	1,076,073	4,000	486,556	45	2,119	53
WHBF, Rock Island, Ill.	247,282	1,348	105,005	43	1,130	84
WLBR, Lebanon, Pa.	46,906	69	9,259	20	45	65
WXYZ, Detroit, Mich.	2,795,221	1,172	841,573	30	895	76
1280 kc.:						
KFOX, Long Beach, Calif.	2,244,000	1,041	2,075,000	93	888	85
WSDU, New Orleans, La.	720,560	1,364	62,220	9	1,117	82
WTCN, Minneapolis, Minn.	717,633	564	379,790	53	451	80
1290 kc.:						
WHIO, Dayton, Ohio.	692,270	1,935	328,360	47	1,695	87
WKNE, Keene, N. H.	23,140	275	10,280	44	230	83
WNBF, Binghampton, N. Y.	183,761	625	39,629	22	495	79
1300 kc.:						
KGLO, Mason City, Iowa.	131,338	2,210	91,055	69	1,704	77
WFBR, Baltimore, Md.	1,306,769	821	335,382	26	683	83
WMAK, Nashville, Tenn.[1]	236,000	157	54,000	23	95	61
	252,000	193	54,000	21	124	64
WOOD, Grand Rapids, Mich.	269,352	716	42,922	16	523	73
1310 kc.:						
WISH, Indianapolis, Ind.[1]	527,446	588	414,423	79	520	95
	521,959	555	299,986	58	456	82
WKMH, Dearborn, Mich.	1,278,495	352	853,060	67	228	65
1320 kc.:						
KDYL, Salt Lake City, Utah.	337,116	2,428	36,269	11	1,027	42
KRCA, Sacramento, Calif.			(3)	(3)	(3)	(3)
WAMP, Pittsburgh, Pa.[1]			964,900		820	
			886,000		810	
1330 kc.:						
KFH, Wichita, Kans.	435,320	8,349	172,079	74	6,199	40
KPOJ, Portland, Oreg.	637,867	865	213,048	33	656	76
WBTM, Danville, Va.		107			42	39
WEVD, New York, N. Y.	7,622,051	394	3,935,986	52	287	73
1350 kc.:						
KRNT, Des Moines, Iowa.	334,290	2,920	113,830	34	2,460	84
KSRO, Santa Rosa, Calif.	164,653		92,698	56	1,172	
WEEK, Peoria, Ill.	183,240	322	55,018	30	266	83
WORK, York, Pa.	131,523		45,688	34		
1370 kc.: WSPD, Toledo Ohio.	647,682	3,094	280,561	43	2,538	82

See footnotes at end of table.

APPENDIX II—Continued

UNLIMITED-TIME STATIONS—continued

Issues (c) and (d)—Continued

Station	Present nighttime primary service		Loss of nighttime primary service under proposal [1]			
	Population	Area (miles)[2]	Population	Percent of present population	Area	Percent of present area
1380 kc.:						
KSBW, Salinas, Calif			33,548		755	
KWK, St. Louis, Mo	2,002,926	2,785	786,801	39	2,386	50
WMBG, Richmond, Va	267,756	150	53,938	20	101	67
1390 kc.:						
WCSC, Charleston, S. C	143,800	420	14,090	10	265	63
WFMJ, Youngstown, Ohio	367,353	433	124,751	34	232	54
WFNC, Fayetteville, N. C	47,220	50	2,750	6	15	30
KERN, Bakersfield, Calif		1,450			1,226	85
WING, Dayton, Ohio	633,000	2,100	491,000	78	2,035	97
1420 kc.: WRBL, Columbus, Ga.[3]	135,710	206	30,530	22	135	66
	144,500	286	25,230	17	157	55
1430 kc.:						
KBRC, Mount Vernon, Wash	16,748	182	6,928	41	122	67
KTUL, Tulsa, Okla	345,437	3,250	100,209	29	2,691	83
WIRE, Indianapolis, Ind	642,100	1,675	119,300	19	1,365	82
1460 kc.:						
WBET, Brockton, Mass			[4]	[4]	[4]	[4]
WBNS, Columbus, Ohio	420,243	573	159,144	38	373	65
WHEC, Rochester, N. Y	445,580	270	22,810	5	75	28
WMBR, Jacksonville, Fla	235,991	186	18,530	8	110	59
1470 kc.:						
WKMF, Flint, Mich	209,734	165	28,678	14	97	59
WLAM, Lewiston, Maine	71,200	177	19,600	28	129	73
WMBD, Peoria, Ill	243,230	1,010	70,010	29	800	79
1480 kc.:						
WDAS, Philadelphia, Pa	1,567,600	140	856,800	55	110	79
WLEE, Richmond, Va	238,964	124	96,226	40	87	70
1500 kc.: WTOP, Washington, D. C	2,393,400	5,700	1,304,300	54	5,274	93
1510 kc.: WLAC, Nashville, Tenn	708,844	10,680	350,557	50	9,410	88
1530 kc.: KFBK, Sacramento, Calif		28,570			18,000	63
1560 kc.:						
KPCM, Bakersfield, Calif			[3]	[3]	[3]	[3]
WQXR, New York, N. Y	11,889,626	4,510	3,351,555	28	4,142	91
1590 kc.: WAKR, Akron, Ohio	984,000	2,410	656,200	67	2,300	95
1600 kc.:						
KBOR, Brownsville, Tex		259			63	24
WWRL, Long Island, N. Y	6,721,029	333	5,966,411	89	314	94

[1] Nighttime service under proposal: Where 2 sets of figures are shown, the upper set applies to the 2d hour of operation following sunset (or before sunrise) and the lower set applies to the 1st hour of operation following sunset.

[2] Basis of determination: In each of these instances, the data was derived on the basis of the 0.1-mv./m. contour.

[3] None from existing stations.

[4] No increase due to existing stations.

APPENDIX III

UNLIMITED-TIME STATIONS

Issue (e)

Station	Present nighttime secondary service		Loss of nighttime secondary service under proposal [1]			
	Population	Area (miles) [2]	Population	Percent of present population	Area	Percent of present area
640 kc.: KFI, Los Angeles, Calif.	3,301,390	744,300	1,386,115	42	552,000	72
650 kc.: WSM, Nashville, Tenn.	38,044,710	1,227,538	16,281,044	43	766,083	57
	13,102,998	241,469	3,002,348	23	113,261	47
660 kc.: WRCA, New York, N. Y.	26,127,000	528,700	26,127,000	100	528,700	100
680 kc.: KNBC, San Francisco, Calif.	3,827,000	670,500	3,082,000	80.5	596,700	89
750 kc.: WSB, Atlanta, Ga.	31,299,769	828,800	31,299,769	100	828,800	100
760 kc.: WJR, Detroit, Mich.	29,449,275	710,939	29,449,275	100	710,939	100
770 kc.: WABC, New York, N. Y.		508,408		100	508,408	100
810 kc.: WGY, Schenectady, N. Y.	23,397,652	453,812	22,729,677	97	450,749	99.5
820 kc.: WFAA/WBAP, Dallas-Fort Worth, Tex.				100		100
850 kc.: KOA, Denver, Colo.				100		100
870 kc.: WWL New Orleans, La.	32,712,380		31,719,889	97		
890 kc.: WLS, Chicago, Ill.	45,276,722	1,250,687	39,671,679	88	1,241,349	99.3
1020 kc.: KDKA, Pittsburgh, Pa.						100
1030 kc.: WBZ, Boston, Mass.						100
1040 kc.: WHO, Des Moines, Iowa				100		100
1060 kc.: WRCV, Philadelphia, Pa.	20,868,000	427,200	20,868,000	100	427,200	100
1080 kc.: KRLD, Dallas, Tex.	3,950,000	632,000	3,950,000	100	632,000	100
1090 kc.:						
WBAL, Baltimore, Md.	6,258,306	138,273	6,258,306	100	138,273	100
KTHS, Little Rock, Ark.	10,809,764	572,484	10,809,784	100	572,484	100
1100 kc.: KYW, Cleveland, Ohio						100
1110 kc.: KFAB, Omaha, Nebr.		1,049,573			1,049,573	100
1120 kc.: KMOX, St. Louis, Mo.				100		100
1140 kc.: WRVA, Richmond, Va.	16,653,753	383,000	16,653,753	100	383,000	100
1160 kc.: KSL, Salt Lake City, Utah.				100		100
1170 kc.:						
KVOO, Tulsa, Okla.	15,600,762		15,600,762	100		100
WWVA, Wheeling, W. Va.	8,516,456		8,516,456	100		100
1190 kc.:						
KEX, Portland, Oreg.						100
WOWO, Fort Wayne, Ind.						100
1210 kc.: WCAU, Philadelphia, Pa.	30,167,942		30,167,942	100		
1500 kc.: WTOP, Washington, D. C.	12,165,100	270,000	2,312,000	19	50,900	19
1510 kc.: WLAC, Nashville, Tenn.	28,114,293	852,655	28,114,293	100	852,655	100
1560 kc.: WQXR, New York, N. Y.	20,080,117	159,000	20,080,117	100	159,000	100

[1] Nighttime service under proposal: Where 2 sets of figures are shown, the upper set applies to the 2d hour of operation following sunset (or before sunrise) and the lower set applies to the 1st hour of operation following sunset.

APPENDIX IV

Daytime stations are located in the following cities and towns which are within nighttime "white areas"; i. e., areas now receiving only secondary (skywave) service with no primary (groundwave) service at night:

	Population (1950)
Alabama:	
Albertville	5, 397
Alexander City	6, 430
Atmore	5, 720
Bay Minette	3, 732
Calera	1, 361
Carrollton	710
Clanton	4, 640
Enterprise	7, 288
Evergreen	3, 454
Fayette	3, 707
Flomaton	1, 036
Foley	1, 301
Geneva	3, 579
Greenville	6, 781
Hartselle	3, 429
Hamilton	1, 623
Jackson	3, 072
Monroeville	2, 772
Marion	2, 822
Oneonta	2, 802
Opp	5, 240
Ozark	5, 238
Piedmont	4, 498
Pell City	1, 189
Prichard	19, 014
Roanoke	5, 392
Tallassee	4, 225
Thomasville	2, 425
Tuskegee	6, 712
Wetumpka	3, 813
Arizona:	
Holbrook	2, 336
Sierra Vista	------
Shaw Law	------
Arkansas:	
Berryville	1, 753
Blytheville	16, 234
Clarksville	4, 343
Crossett	4, 619
DeQueen	3, 015
Harrison	5, 542
Magnolia	6, 918
Malvern	8, 072
Morriltown	5, 483
Newport	6, 254
Osceola	5, 006
Pocahontas	3, 804
Rogers	4, 964
Searcy	6, 024
Siloam Springs	3, 270
Walnut Ridge	3, 106
California:	
Alturas	2, 819
Coalinga	5, 539
Lampoe	------
Colorado:	
Cortez	2, 680
Fort Lupton	1, 907

	Population (1950)
Colorado—Continued	
Glenwood Springs	2, 412
Walsenburg	5, 596
Delaware: Georgetown	1, 923
Florida:	
Auburndale	3, 763
Avon Park	4, 612
Arcadia	4, 764
Belle Glade	7, 219
Cocoa	4, 245
Crestview	5, 003
DeFuniak Springs	3, 077
Eau Gallie	1, 554
Fernandina Beach	554
Fort Walton Beach	2, 463
Lake Wales	6, 821
Live Oak	4, 064
Naples	1, 465
Panama City Beach	25, 814
Riviera Beach	4, 065
South Daytona	692
Titusville	2, 604
Ward Ridge	------
Georgia:	
Adel	2, 776
Americus	11, 389
Ashburn	2, 918
Bainbridge	7, 562
Baxley	3, 409
Camilla	3, 745
Cairo	5, 577
Carrollton	7, 753
Dawson	4, 411
Dublin	10, 232
Fitzgerald	8, 130
Fort Valley	6, 820
Hawkinsville	3, 342
Jesup	4, 605
McRae	1, 904
Perry	3, 849
Quitman	4, 769
Swainsboro	4, 300
Toccoa	6, 781
Vidalia	5, 819
Waynesboro	4, 461
West Point	4, 076
Warner-Robins	7, 986
Idaho:	
Soda Springs	1, 329
Rupert	3, 098
Illinois:	
Anna	4, 380
Carbondale	10, 921
Carmi	5, 574
Harvard	3, 464
Litchfeld	7, 208
Marion	10, 459
Metropolis	6, 093
Mount Carmel	8, 732

	Population (1950)
Kansas:	
Chanute	10, 109
Colby	3, 859
Concordia	7, 175
Fort Scott	10, 335
Goodland	4, 690
Liberal	7, 134
Pratt	7, 523
Russell	6, 483
Kentucky:	
Barbourville	2, 926
Benton	1, 980
Cumberland	4, 249
Fulton	3, 224
Harlan	4, 786
Manchester	1, 706
Mayfield	8, 990
Middlesboro	14, 482
Neon	1, 055
Prestonburg	3, 585
Van Cleve	------
Whitesburg	1, 393
Louisiana:	
Abbeville	9, 338
De Ridder	5, 799
Ferriday	3, 847
Haynesville	3, 040
Homer	4, 749
Lake Providence	4, 123
Leesville	4, 670
Marksville	3, 635
Oakdale	5, 598
Oakgrove	1, 796
Rayville	3, 138
Sulphur	5, 996
Ville Plate	6, 633
Tallulah	7, 758
Vivian	2, 426
Winnfield	5, 629
Winnsboro	3, 655
Maine:	
Caribou	4, 500
Rumford	7, 888
Skowhegan	6, 183
Sanford	11, 094
Maryland: Pocomoke City	3, 191
Massachusetts:	
Orange	4, 048
Southbridge	16, 748
Michigan:	
Big Rapids	6, 736
Gaylord	2, 271
Hancock	5, 223
Niles	13, 145
Rogers City	3, 873
St. Helen	------
Mississippi:	
Amory	4, 990
Batesville	2, 463
Forest	2, 874
Indianola	4, 369
Hazelhurst	3, 397
Houston	1, 664
Kosciusko	6, 753
Louisville	5, 282

Mississippi—Continued	Population (1950)
Leland	4, 736
Magee	1, 738
New Albany	3, 680
Newton	2, 912
Oxford	3, 956
Waynesboro	3, 442
Missouri:	
Boonville	6, 686
Branson	1, 314
Caruthersville	8, 614
Charleston	5, 501
Dexter	4, 624
Kennett	8, 685
Malden	3, 396
Mountain Grove	3, 106
Marshall	8, 850
Osage Beach	------
Thayer	1, 639
Willow Springs	1, 914
Nebraska:	
Broken Bow	3, 396
Holdrege	4, 381
Lexington	5, 068
McCook	7, 678
Ogallala	3, 456
Nevada: Fallon	2, 400
New Hampshire:	
Conway	1, 238
Laconia	14, 745
Rochester	13, 776
New Mexico:	
Deming	5, 672
Grants	2, 251
Lovington	3, 134
Socorro	4, 334
Tularosa	1, 642
New York:	
Elmira Heights	5, 009
Hornell	15, 049
Ithaca	29, 257
Owego	5, 350
Potsdam	7, 491
Wellsville	6, 402
North Carolina:	
Ahoskie	3, 579
Asheboro	7, 701
Burlington	24, 560
Clinton	4, 414
Edenton	4, 468
Elizabethtown	1, 611
Elkin	2, 842
Fairmont	2, 319
Forest City	4, 971
Franklin	1, 975
Kings Mountain	7, 206
Laurinburg	7, 134
Lincolnton	5, 423
Marion	2, 740
Marshall	983
Mayodan	2, 246
Morehead City	5, 144
Morganton	8, 311
North Wilkesboro	4, 379
Plymouth	4, 486

	Population (1950)
North Carolina—Continued	
Rockingham	3, 356
Shelby	15, 508
Spruce Pine	2, 280
Southern Pines	4, 272
Sylva	1, 382
Tabor City	2, 033
Tarboro	8, 120
Thomasville	11, 154
Tryon	1, 985
Whiteville	4, 238
Williamston	4, 975
Ohio:	
Gallipolis	7, 871
Wellston	5, 691
Oklahoma:	
Clinton	7, 555
Guymon	4, 718
Poteau	4, 776
Pryor Creek	4, 486
Tahlequah	4, 750
Oregon:	
Brookings	-----
Coquille	3, 523
Hermiston	3, 804
Prineville	3, 233
Pennsylvania:	
Berwick	14, 010
Carlisle	16, 812
Chambersburg	17, 212
Clearfield	9, 357
Corry	7, 911
Coudersport	3, 210
Emporium	3, 646
Huntingdon	7, 330
Kane	5, 706
Lewisburg	5, 268
Mexico	-----
Milton	8, 578
Nanticoke	20, 160
Sayre	7, 735
Stroudsburg	6, 361
Tyrone	8, 214
Warren	14, 849
Waynesboro	10, 334
South Carolina:	
Abbeville	5, 395
Aiken	7, 083
Bamberg	2, 954
Barnwell	2, 005
Beaufort	5, 081
Belton	3, 371
Bishopville	3, 076
Batesburg	3, 169
Camden	6, 986
Cheraw	4, 836
Clinton	7, 168
Conway	6, 073
Darlington	6, 619
Dillon	5, 171
Easley	6, 316
Fountain Inn	1, 325
Gaffney	8, 123
Hampton	2, 007
Kingstree	3, 621

	Population (1950)
South Carolina—Continued	
Lake City	5, 112
Laurens	8, 658
Manning	2, 775
Marion	6, 834
Mullins	4, 916
Seneca	3, 649
Walterboro	4, 616
South Dakota:	
Pierre	5, 715
Winner	3, 252
Tennessee:	
Church Hill	-----
Covington	4, 379
Dayton	3, 191
Erwin	3, 387
Etowah	3, 261
Humbolt	7, 426
Jonesboro	1, 126
Lenior City	5, 159
Martin	4, 082
McKenzie	3, 774
Milan	4, 938
Newport	3, 892
Ripley	3, 318
Rogersville	2, 545
Savannah	1, 698
South Pittsburg	2, 573
Sweetwater	4, 199
Texas:	
Andrews	3, 294
Atlanta	3, 782
Big Lake	2, 152
Brenham	6, 941
Brownfield	6, 161
College Station	7, 925
Colorado City	6, 774
Conroe	7, 298
Dalhart	5, 918
Dumas	6, 127
Eagle Pass	7, 276
El Campo	6, 237
Falfurrias	6, 712
Floydada	3, 210
Kermit	6, 912
Kingsville	16, 898
Livingston	2, 865
Post	3, 141
Seminole	3, 479
Shamrock	3, 322
Utah: Vernal	2, 845
Vermont:	
Springfield	4, 940
St. Albans	8, 552
Virginia:	
Bedford	4, 061
Big Stone Gap	5, 173
Blackstone	3, 536
Crewe	2, 030
Christiansburg	2, 967
Emporia	5, 664
Farmville	4, 375
Gretna	803
Galax	5, 248
Grundy	1, 947

Virginia—Continued	*Population (1950)*
Leesburg	1,703
Lawrenceville	2,239
Marion	6,982
Narrows-Pearisburg	2,520–2,005
Mount Jackson	732
Norton	4,315
Pennington Gap	2,090
Richlands	4,648
Rocky Mount	1,432
South Hill	2,153
Tasley	-----
Warsaw	435
Warrenton	1,797
Wytheville	5,513
Washington:	
Colville	3,033
Ephrata	4,589
Omak	3,791
Prosser	2,636
Quincy	804

West Virginia:	*Population (1950)*
Fisher	-----
Keyser	6,347
Matewan	989
Moorefield	1,405
Oak Hill	4,518
Pineville	1,082
Ravenswood	1,175
Richwood	5,321
Wisconsin:	
Antigo	9,902
Beaver Dam	11,867
Black River Falls	2,824
Hartford	4,549
Neillsville	2,663
Sparta	5,893
Stevens Point	16,564
Sturgeon Bay	7,054
Viroqua	3,795
Wyoming: Douglas	2,544