§ 73.186 Establishment of effective field at one kilometer.

(a) Section 73.189 provides that certain minimum field strengths are acceptable in lieu of the required minimum physical heights of the antennas proper. Also, in other situations, it may be necessary to determine the effective field. The following requirements shall govern the taking and submission of data on the field strength produced:

(1) Beginning as near to the antenna as possible without including the induction field and to provide for the fact that a broadcast antenna is not a point source of radiation (not less than one wave length or 5 times the vertical height in the case of a single element, i.e., nondirectional antenna or 10 times the spacing between the elements of a directional antenna), measurements shall be made on six or more radials, at intervals of approximately 0.2 kilometers up to 3 kilometers from the antenna, at intervals of approximately one kilometer from 3 kilometers to 5 kilometers from the antenna, at intervals of approximately 2 kilometers from 5 kilometers to 15 kilometers from the antenna, and a few additional measurements if needed at greater distances from the antenna. Where the antenna is rural and unobstructed measurements can be made, there shall be at least 15 measurements on each radial. These shall include at least 7 measurements within 3 kilometers of the antenna, at least 5 measurements from 3 kilometers to 5 kilometers, at intervals of approximately 0.2 kilometers, 6 measurements if needed at greater distances from the antenna, and unobstructed measurements are difficult to make, measurements shall be made on each radial at as many unobstructed locations as possible, even though the intervals are considerably less than stated above, particularly within 3 kilometers of the antenna. In cases where it is not possible to obtain accurate measurements at the closer distances (even out to 8 or 10 kilometers due to the character of the intervening terrain), the measurements at greater distances should be made at closer intervals.

(2) The data required by paragraph (a)(1) of this section should be plotted for each radial in accordance with either of the two methods set forth below:

(i) Using log-log coordinate paper, plot field strengths as ordinates and distances as abscissas.

(ii) Post-sunset Constants

<table>
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<tr>
<th>θ</th>
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<th>b</th>
<th>c</th>
<th>d</th>
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</table>

Note: At 56 FR 64867, Dec. 12, 1991, §73.186 was amended by redesignating paragraphs (d), (e), (h), and (k) as (c), (d), (e), and (f), resulting in two consecutive paragraphs (d), (e), (h), and (k) as (c), (d), (e), and (f), except that Figure 2 of §73.190 is used in place of Figure 1a and 1b and the formulas of §73.190, latitude 35° North and latitude 50° North.
(ii) Using semi-log coordinate paper, plot field strength times distance as ordinate on the log scale and distance as abscissa on the linear scale.

(3) However, regardless of which of the methods in paragraph (a)(2) of this section is employed, the proper curve to be drawn through the points plotted shall be determined by comparison with the curves in §73.184 as follows: Place the sheet on which the actual points have been plotted over the appropriate Graph in §73.184, hold to the light if necessary and adjust until the curve most closely matching the points is found. This curve should then be drawn on the sheet on which the points were plotted, together with the inverse distance curve corresponding to that curve. The field at 1 kilometer for the radial concerned shall be the ordinate on the inverse distance curve at 1 kilometer.

(4) When all radials have been analyzed in accordance with paragraph (a)(3) of this section, a curve shall be plotted on polar coordinate paper from the fields obtained, which gives the inverse distance field pattern at 1 kilometer. The radius of a circle, the area of which is equal to the area bounded by this pattern, is the effective field. (See §73.14.)

(5) The antenna power of the station shall be maintained at the authorized level during all field measurements. The power determination will be made using the direct method as described in §73.51(a) with instruments of acceptable accuracy specified in §73.1215.

(b) Complete data taken in conjunction with the field strength measurements shall be submitted to the Commission in affidavit form including the following:

(1) Tabulation by number of each point of measurement to agree with the maps required in paragraph (c) of this section, the date and time of each measurement, the field strength (E), the distance from the antenna (D) and the product of the field strength and distance (ED) (if data for each radial are plotted on semilogarithmic paper, see paragraph (a)(2)(ii) of this section) for each point of measurement.

(2) Description of method used to take field strength measurements.

(3) The family of theoretical curves used in determining the curve for each radial properly identified by conductivity and dielectric constants.

(4) The curves drawn for each radial and the field strength pattern.

(5) The antenna resistance at the operating frequency.

(6) Antenna current or currents maintained during field strength measurements.

(c) Maps showing each measurement point numbered to agree with the required tabulation shall be retained in the station records and shall be available to the FCC upon request.

§73.187 Limitation on daytime radiation.

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

(b) Complete data taken in conjunction with the field strength measurements shall be submitted to the Commission in affidavit form including the following:

(1) Tabulation by number of each point of measurement to agree with the maps required in paragraph (c) of this section, the date and time of each measurement, the field strength (E), the distance from the antenna (D) and the product of the field strength and distance (ED) if data for each radial are plotted on semilogarithmic paper, see paragraph (a)(2)(ii) of this section) for each point of measurement.

(2) Description of method used to take field strength measurements.

(3) The family of theoretical curves used in determining the curve for each radial properly identified by conductivity and dielectric constants.

(4) The curves drawn for each radial and the field strength pattern.

(5) The antenna resistance at the operating frequency.

(6) Antenna current or currents maintained during field strength measurements.

(c) Maps showing each measurement point numbered to agree with the required tabulation shall be retained in the station records and shall be available to the FCC upon request.