

§ 21.902

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(f) MDS H-channel applications. Frequencies in the bands 2650–2656 MHz, 2662–2668 MHz, or 2674–2680 MHz must be assigned only in accordance with the following conditions: All applications for MDS H-channel stations must specify either the H1, H2, or H3 channel for which an application is filed; however, the Commission may on its own initiative assign different channels in these frequency bands if it is determined that such action would serve the public interest.

(g) Frequencies in the bands 2150–2162 MHz, 2596–2644 MHz, 2650–2656 MHz, 2662–2668 MHz and 2674–2680 MHz are available for point-to-multipoint use and/or for communications between MDS response stations and response station hubs when authorized in accordance with the provisions of § 21.909, provided that such frequencies may be employed for MDS response stations only when transmitting using digital modulation.

[44 FR 60534, Oct. 19, 1979, as amended at 48 FR 33900, July 26, 1983; 49 FR 25479, June 21, 1984; 49 FR 37777, Sept. 26, 1984; 55 FR 46009, Oct. 31, 1990; 56 FR 57598, Nov. 13, 1991; 56 FR 57817, Nov. 14, 1991; 58 FR 11798, Mar. 1, 1993; 58 FR 44895, Aug. 25, 1993; 60 FR 36552, July 17, 1995; 61 FR 26676, May 28, 1996; 63 FR 65102, Nov. 25, 1998; 64 FR 4054, Jan. 27, 1999; 64 FR 63731, Nov. 22, 1999; 65 FR 54169, Sept. 7, 2000; 68 FR 16965, Apr. 8, 2003]

§ 21.902 Interference.

(a) All applicants, conditional licensees, and licensees shall make exceptional efforts to avoid harmful interference to other users and to avoid blocking potential adjacent channel use in the same city and cochannel use in nearby cities. In areas where major cities are in close proximity, careful consideration should be given to minimum power requirements and to the location, height, and radiation pattern of the transmitting antenna. Licensees, conditional licensees, and applicants are expected to cooperate fully in attempting to resolve problems of potential interference before bringing the matter to the attention of the Commission.

(b) As a condition for use of frequency in this service, each applicant, conditional licensee, and licensee is required to:

(1) Not enter into any lease or contract or otherwise take any action that would unreasonably prohibit location of another station's transmitting antenna at any given site inside its own protected service area.

(2) Cooperate fully and in good faith to resolve interference and transmission security problems.

(3) Engineer the system to provide at least 45 dB of cochannel interference protection within the 56.33 km (35 mile) protected service area of any authorized or previously-proposed ITFS or incumbent MDS station, and at each previously-registered ITFS receive site registered as of September 17, 1998 (or the appropriate value for bandwidths other than 6 MHz.)

(4) Engineer the station to provide at least 0 dB of adjacent channel interference protection within the 56.33 km (35 mile) protected service area of any authorized or previously-proposed ITFS or incumbent MDS station, and at each previously-registered ITFS receive site registered as of September 17, 1998 (or the appropriate value for bandwidths other than 6 MHz.)

(5)(i) Engineer the station to limit the calculated free space power flux density to -73 dBW/m² (or the appropriate value for bandwidth other than 6 MHz) at the boundary of a 56.33 km (35 mile) protected service area, where there is an unobstructed signal path from the transmitting antenna to the boundary; or alternatively, obtain the written consent of the entity authorized for the adjoining area to exceed the -73 dBW/m² limiting signal strength at the common boundary.

(ii) In determining signal path conditions, the following shall be used: a 9.1 meter (30 feet) receiving antenna height, the transmitting antenna height, terrain elevations and 4/3 earth radius propagation conditions.

(6) If a proposed station is within 80 km (50 miles) of the Canadian or Mexican border, the station must be designed to meet the requirements set forth in international treaties.

(7) Notwithstanding the above, main, booster and response stations shall use the following formulas, as applicable, for determining compliance with: (1) Radiated field contour limits where

bandwidths other than 6 MHz are employed at stations utilizing digital emissions; and (2) Cochannel and adjacent channel D/U ratios where the bandwidths in use at the interfering and protected stations are unequal and both stations are utilizing digital modulation or one station is utilizing digital modulation and the other station is utilizing either 6 MHz NTSC analog modulation or 125 kHz analog modulation (I channels only).

(i) Contour limit: $-73 \text{ dBW/m}^2 + 10 \log(X/6) \text{ dBW/m}^2$, where X is the bandwidth in MHz of the digital channel.

(ii) Co-channel D/U: $45 \text{ dB} + 10 \log(X_1/X_2) \text{ dB}$, where X_1 is the bandwidth in MHz of the protected channel and X_2 is the bandwidth in MHz of the interfering channel.

(iii) Adjacent channel D/U: $0 \text{ dB} + 10 \log(X_1/X_2) \text{ dB}$ where X_1 is the bandwidth in MHz of the protected channel and X_2 is the bandwidth in MHz of the interfering channel.

(c) The following interference studies must be prepared:

(1) An analysis of the potential for harmful interference within the 56.33 km (35 mile) protected service areas of any authorized or previously proposed incumbent station:

(i) If the coordinates of the applicant's proposed transmitter are within 160.94 km (100 miles) of the center coordinates of any authorized or previously proposed incumbent station with protected service area of 56.33 km (35 miles) as specified in § 21.902(d); or

(ii) If the great circle path between the applicant's proposed transmitter and the protected service area of any authorized, or previously-proposed, co-channel or adjacent-channel station(s) is within 241.4 kilometers or less and 90 percent or more of the path is over water or within 16.1 kilometers of the coast or shoreline of the Atlantic Ocean, the Pacific Ocean, the Gulf of Mexico, any of the Great Lakes, or any bay associated with any of the above (see §§ 21.901(a) and 74.902 of this chapter);

(2) Applicants may design interference studies in any manner that demonstrates the avoidance of harmful interference, as defined in this subpart.

(i) In lieu of interference studies, applicants may submit in accordance

with § 21.938 a written statement of no objection to the operation of the MDS station.

(ii) The Commission may direct applicants to submit interference studies of a specific nature.

(3) Except for new stations proposed in applications filed after September 15, 1995, in the case of a proposal to operate a non-colocated station within the protected service area of an authorized, or previously proposed, adjacent channel station, an analysis that identifies the areas within the protected service areas of both the authorized or previously proposed adjacent channel station and the proposed station that cannot be protected as specified in § 21.902(b)(4) and an explanation of why the proposed station cannot be colocated with the existing or previously proposed station.

(4) In the case of a proposal for use of channel 2, an analysis of the potential for harmful interference with any authorized point-to-point station located within 80.5 kilometers (50 miles) which utilizes the 2160-2162 MHz band; and

(d)(1) Subject to the limitations contained in paragraph (e) of this section, each MDS station licensee shall be protected from harmful electrical interference, as determined by the theoretical calculations, within a protected service area of which the boundary will be 56.3255 kilometers (35 miles) from the transmitter site.

(2) As of September 15, 1995, the location of these protected service area boundaries shall become fixed. The center of the circular area shall be the geographic latitude and longitude of the transmitting antenna site specified in station authorizations or previously proposed applications filed at the Commission before September 15, 1995. Subsequent transmitter site changes will not change the location of the 56.3255 kilometers (35 mile) protected service area boundaries.

(e) No MDS licensee will be protected from harmful interference caused by:

(1) Any station with an earlier filing date.

(2) Any station that was authorized before July 1984.

(3) Any multichannel MDS station whose application was pending on September 9, 1983.

(f) In addressing potential harmful interference in this service, the following definitions, procedures and other criteria shall apply:

(1) Cochannel interference is defined as the ratio of the desired signal to the undesired signal present in the desired channel, at the output of a reference receiving antenna oriented to receive the maximum desired signal. Harmful interference will be considered present when a calculation using a terrain sensitive signal propagation model determines that this ratio is less than 45 dB (or the appropriate value for bandwidths other than 6 MHz.)

(2) Adjacent channel interference is defined as the ratio of the desired signal to undesired signal present in an adjacent channel, at the output of a reference receiving antenna oriented to receive the maximum desired signal level.

(i) Harmful interference will be considered present when a calculation using a terrain sensitive model determines that this ratio is less than 0dB (or the appropriate value for bandwidths other than 6 MHz.)

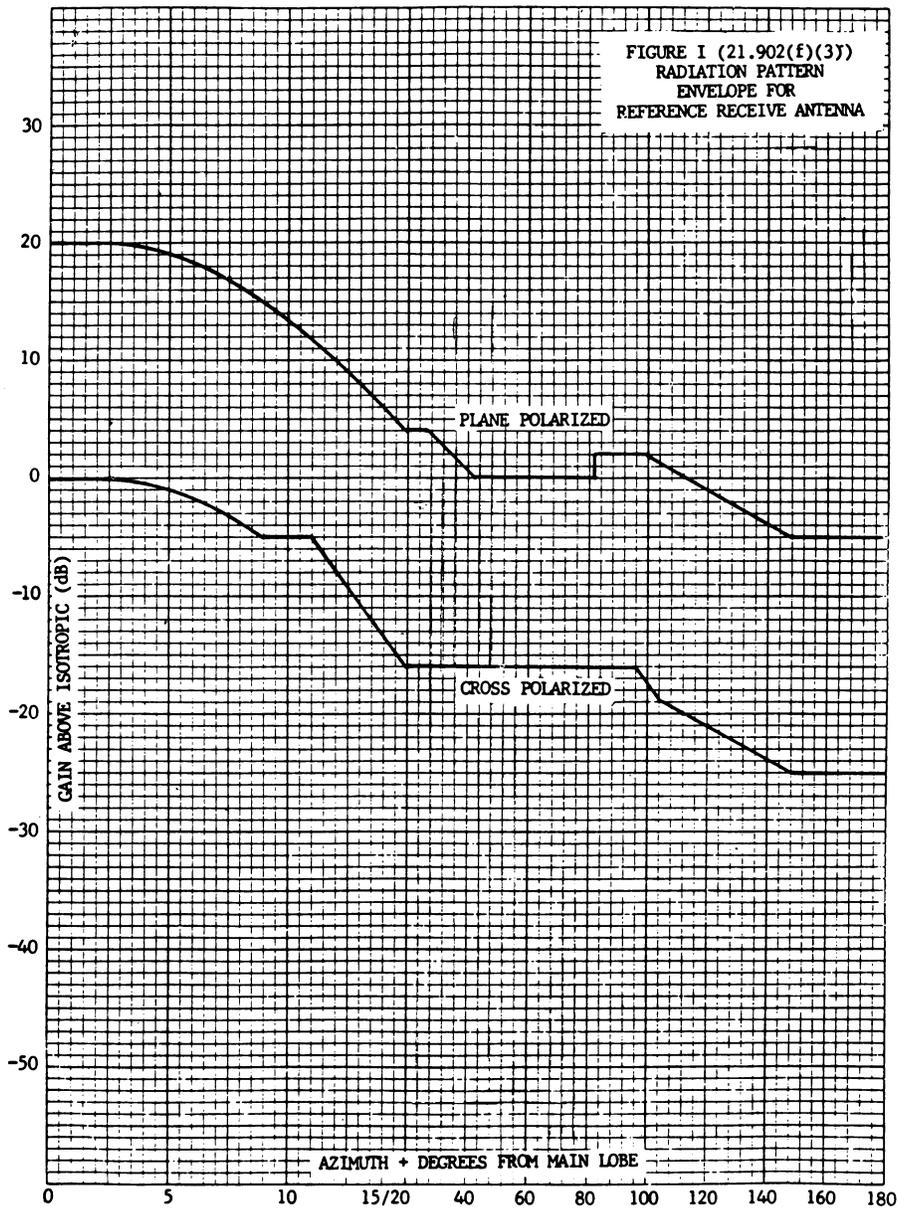
(ii) In the alternative, harmful interference will be considered present for an ITFS station constructed before May 26, 1983, when a calculation using a terrain-sensitive propagation model

determines that this ratio is less than 10 dB (or the appropriate value for bandwidths other than 6 MHz.) unless:

(A) The individual receive site under consideration has been subsequently upgraded with up-to-date reception equipment, in which case the ratio shall be less than 0 dB. Absent information presented to the contrary, however, the Commission will assume that reception equipment installation occurred simultaneously with original station equipment; or

(B) The license for an MDS station is conditioned on the proffer to the affected ITFS station licensee of equipment capable of providing a ratio of 0 dB or more at no expense to the ITFS station licensee, and also conditioned, if necessary, on the proffer of installation of such equipment; and there has been no showing by the affected ITFS station licensee demonstrating good cause and that the proposed equipment will not provide a ratio of 0 dB or more, or that installation of such equipment, at no expense to the ITFS station licensee, is not possible or has not been proffered.

(3) For purposes of this section all interference calculations involving receive antenna performance shall use the reference antenna characteristics shown in figure 1.



(4) For purposes of this section, the received signal power level (RSL)_{dBW} at the output of the FCC reference receiving antenna is obtained from the fol-

lowing formulas (or an equivalent adaptation):

$$(RSL)_{dBW} = (EIRP)_{dBW} - (L_{FS})_{dB} + (G_{AR})_{dB}$$

where the free space loss (L_{FS}) is

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$$(L_{FS})_{dB} = 20 \log (4d/\lambda)$$

in which the parameters are defined as follows:

$(RSL)_{dBW}$ is the received power in decibels referenced to one watt.

$(EIRP)_{dBW}$ is the equivalent isotropically radiated power in decibels above one watt.

d is the distance of the signal path in meters.

λ is the wavelength of the signal in meters.

G_{AR} is the dB gain of the reference receiving antenna above an isotropic antenna (obtained from Figure 1 of this section.)

(5) A determination of signal path conditions shall use a 9.1 meters (30 feet) receiving antenna height, the transmitting antenna height, terrain elevation, and assume 4/3 earth radius propagation conditions.

(6) An application will not be accepted for filing if cochannel or adjacent channel interference is predicted at the boundary of the 56.33 km (35 mile) protected service area of an authorized or previously proposed incumbent station based on the following criteria:

(i) Interference calculations shall be made only for directions where there is an unobstructed signal path from the site of a proposed station to the boundary of any protected area.

(ii) Calculations of received power levels in units of dBW from the proposed station will be made at one degree intervals around the protected service area.

(iii) The assumed value of the desired signal level at the boundary of an incumbent station shall be -83 dBW, which is the calculated received power in free space at a distance of 56.33 km (35 miles), given at EIRP of 2000 watts and a receiver antenna gain of 20 dBi.

(iv) Harmful interference will be considered to occur at locations along the boundary wherever the ratio between the desired signal level of -83 dBW and the received power from a proposed cochannel or adjacent channel station is less than 45 dB or 0 dB for cochannel or adjacent channel proposals, respectively.

(7) Alternatively, MDS applications will be accepted on the basis of an executed written interference agreement between potentially affected parties filed in accordance with § 21.938.

(g)(1) All interference studies prepared pursuant to paragraph (c) of this section must be served on all licensees,

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conditional licensees, and applicants for the stations required to be studied by this section. This service must include a copy of the FCC application and occur on or before the date the application is filed with the Commission.

(2) MDS licensees, conditional licensees and applicants of facilities with 56.33 km (35 mile) protected service areas shall notify in writing the holders of authorizations for adjoining BTAs or PSAs of application filings for modified station licenses, provided the proposed facility would produce an unobstructed signal path to any location within the adjoining BTA or PSA. This service must include a copy of the FCC application and occur on or before the date the application is filed with the Commission.

(h) For purposes of § 21.31(a), an MDS application, except for those applications filed on or after September 15, 1995, filed for a facility that would cause harmful electrical interference within the protected service area of any authorized or previously proposed station will be presumed to be mutually exclusive with the application for such authorized or previously proposed station.

(i)(1) For each application for a new station, or amendment thereto, proposing MDS facilities, filed on October 1, 1995, or thereafter, on or before the day the application or amendment is filed, the applicant must prepare an analysis demonstrating that operation of the MDS applicant's transmitter will not cause harmful electrical interference to each receive site registered as of September 17, 1998, nor within a protected service area as defined in paragraph (d)(1) of this section, of any cochannel or adjacent channel ITFS station licensed, with a conditional license, or proposed in a pending application on the day such MDS application is filed, with an ITFS transmitter site within 50 miles of the coordinates of the MDS station's proposed transmitter site.

(2) For each application described in paragraph (i)(1) of this section, the applicant must serve, by certified mail, return receipt requested, on or before the day the application or amendment

described in paragraph (i)(1) of this section is filed initially with the Commission, a copy of the complete MDS application or amendment, including each exhibit and interference study, described in paragraph (i)(1) of this section, on each ITFS licensee, conditional licensee, or applicant described in paragraph (i)(1) of this section.

(3) For each application described in paragraph (i)(1) of this section, the applicant must certify and file, with the application or amendment, its certification of its compliance with the requirements of paragraph (i)(2) of this section.

(4) For each application described in paragraph (i)(1) of this section, the applicant must file with the Commission in Washington, DC, on or before the 30th day after the application or amendment described in paragraph (i)(1) of this section is filed initially with the Commission, a written notice which contains the following:

- (i) Caption—ITFS Service Notice;
- (ii) Applicant's name, address, proposed service area and channel group, and application file number, if known;
- (iii) A list of each ITFS licensee and conditional licensee described in paragraph (i)(1) of this section;
- (iv) The address used for service to each ITFS licensee and conditional licensee described in paragraph (i)(1) of this section; and
- (v) A list of the date each ITFS licensee and conditional licensee described in paragraph (i)(1) of this section received a copy of the complete application or amendment described in paragraph (i)(1) of this section; or a notation of lack of receipt by the ITFS licensee or conditional licensee of a copy of the complete application or amendment, on or before such 30th day, together with a description of the applicant's efforts for receipt by each such licensee or conditional licensee lacking receipt of the application.

(5) The public notices described in paragraph (i)(6) of this section are as follows:

(i) For initial applications for new MDS stations which participate in a lottery, this public notice is the notice announcing the selection of the applicant's application by lottery for qualification review.

(ii) For initial applications for new MDS stations which participate in a competitive bidding process, this public notice is the notice announcing the application of the winning bidder in the competitive bidding process has been accepted for filing.

(iii) For initial applications for new MDS stations which do not participate in a lottery or a competitive bidding process, this public notice is the notice announcing that the applicant's application is not mutually-exclusive with other MDS applications.

(iv) For MDS modification applications, this public notice is the notice announcing that the modification application has been accepted for filing.

(6)(i) Notwithstanding the provisions of Sections 1.824(c) and 21.30(a)(4), for each application described in paragraph (i)(1) of this section, each ITFS licensee and each ITFS conditional licensee described in paragraph (i)(1) of this section may file with the Commission, on or before the 30th day after the public notice described in paragraph (i)(5) of this section, a petition to deny the MDS application.

(ii) Except for the requirements as to the filing time deadline, this petition to deny must otherwise comply with the provisions of Section 21.30.

(iii) In addition, this ITFS petition to deny must:

(A) Identify the subject MDS application, including the applicant's name, station location, channel group, and application file number;

(B) Include a certificate of service demonstrating service on the subject MDS applicant by certified mail, return receipt requested, on or before the 30th day after the MDS public notice described in paragraph (i)(5) of this section;

(C) Include a demonstration that it made efforts to reach agreement with the MDS applicant but was unable to do so;

(D) Include an engineering analysis that operation of the proposed MDS station will cause harmful interference to its ITFS station;

(E) Include a demonstration, in those cases in which the MDS applicant's analysis is dependent upon modification(s) to the ITFS facility, that the harmful interference cannot be avoided

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by the proposed substitution of new or modified equipment to be supplied and installed by the MDS applicant, at no expense to the ITFS licensee or conditional licensee; and

(F) Be limited to raising objections concerning the potential for harmful interference to its ITFS station, or concerning a failure by the MDS applicant to serve the ITFS licensee or conditional licensee with a copy of the complete application or amendment described in paragraph (i)(1) of this section.

(iv) The Commission will presume an ITFS licensee or conditional licensee described in paragraph (i)(1) of this section has no objection to operation of the MDS station, if the ITFS licensee or conditional licensee fails to file a petition to deny by the deadline prescribed in paragraph (i)(6)(i) of this section.

(j) If the initial application for facilities in the 2596–2644 frequency band was filed on September 9, 1983, an applicant proposing to modify such facilities must include with its modification application:

(1) An analysis demonstrating that the modification will not increase the size of the geographic area suffering harmful interference within the protected service area of existing or proposed co-channel or adjacent-channel facilities in the 2596–2644 MHz frequency band with a transmitter site within 80.5 km (50 miles) of the modifying station's transmitter site of the initial application for the interfered-with station was filed on September 9, 1983; and

(2) An analysis demonstrating that the modification will not cause harmful interference to any new portion of the protected service area of existing or proposed co-channel or adjacent-channel facilities in the 2596–2644 frequency band with a transmitter site within 80.5 km (50 miles) of the modifying station's transmitter site, if the initial application for the interfered-with station was filed on September 9, 1983.

(k) If an initial application for facilities in the 2596–2644 frequency band was filed on September 9, 1983, a licensee proposing to modify a constructed station may request exclusion from the

interference analysis prescribed at § 21.902(c) (1) and (2) with respect to another specified application for E or F channel facilities, if the modifying licensee files as part of its modification application a demonstration that:

(1) The MDS application for which exclusion is requested was proposed by an initial application filed on September 9, 1983;

(2) The MDS application for which exclusion is requested is not yet perfected by the submission of the information necessary for processing, as of the date of filing of the modification application; and

(3) A copy of the licensee's modification application, including the demonstration specified in this paragraph, was served on the MDS applicant for which exclusion is requested, on or before the date of filing of the modification application.

(l) Specific rules relating to response station hubs, booster stations, and 125 kHz channels are set forth in §§ 21.909, 21.913, 21.940, 74.939 of this chapter, 74.940 of this chapter and 74.985 of this chapter. To the extent those specific rules are inconsistent with any rules set forth above, those specific rules shall control.

(m) The following information formats and storage media are to be used in connection with applications for new and modified MDS and ITFS stations:

(1) The data file prepared for submission to the Commission's Reference Room pursuant to the requirements set out at paragraph 74 of Appendix D to the *Report and Order* in MM Docket 97–217, FCC 98–231, must be in ASCII format on either CD-ROMs or 3.5" diskettes. Any supplementary information submitted in connection with Appendix D may be in either ASCII or PDF format (graphics must be in PDF format) on either CD-ROMs or 3.5" diskettes. Applicants serving such data/information on other applicants and/or licensees should do so using the same format(s) and media as used in their submission to the Commission's Reference Room.

(2) Demonstrations and certifications prepared for submission to the Commission's Reference Room may be in either hard copy or in ASCII or PDF format on CD-ROM's or 3.5" diskettes.

(Graphics must be either hard copy or PDF format) Applicants serving such demonstrations and certifications on other applicants and/or licensees should do so using the same format(s) and media as used in their submission to the Commission's Reference Room.

[44 FR 60534, Oct. 19, 1979, as amended at 48 FR 33901, July 26, 1983; 49 FR 25479, June 21, 1984; 52 FR 27556, July 22, 1987; 55 FR 46010, Oct. 31, 1990; 56 FR 57598, Nov. 13, 1991; 56 FR 57818, Nov. 14, 1991; 56 FR 65191, Dec. 16, 1991; 58 FR 11798, Mar. 1, 1993; 58 FR 44895, Aug. 25, 1993; 60 FR 36553, July 17, 1995; 60 FR 36739, July 18, 1995; 60 FR 57367, Nov. 15, 1995; 61 FR 18098, Apr. 24, 1996; 61 FR 26676, May 28, 1996; 63 FR 65102, Nov. 25, 1998; 64 FR 63731, Nov. 22, 1999; 65 FR 46617, July 31, 2000]

EFFECTIVE DATE NOTE: At 65 FR 46617, July 31, 2000, §21.902 was amended by adding paragraph (m). This paragraph contains information collection and recordkeeping requirements and will not become effective until approval has been given by the Office of Management and Budget.

§ 21.903 Purpose and permissible service.

(a) Multipoint Distribution Service channels are available for transmissions from MDS stations and associated MDS signal booster stations to receive locations, and from MDS response stations to response station hubs. When service is provided on a common carrier basis, subscriber supplied information is transmitted to points designated by the subscriber. When service is provided on a non-common carrier basis, transmissions may include information originated by persons other than the licensee, licensee-manipulated information supplied by other persons, or information originated by the licensee. Point-to-point radio return links from a subscriber's location to a MDS operator's facilities may also be authorized in the 18,580 through 18,820 MHz and 18,920 through 19,160 MHz bands. Rules governing such operation are contained in subpart I of part 101 of this chapter, the Point-to-Point Microwave Radio Service.

(b) Unless otherwise directed or conditioned in the applicable instrument of authorization, Multipoint Distribution Service stations may render any kind of communications service consistent with the Commission's rules on

a common carrier or on a non-common carrier basis, *Provided That*:

(1) Unless service is rendered on a non-common carrier basis, the common carrier controls the operation of all receiving facilities (e.g., including any equipment necessary to convert the signal to a standard television channel, but excluding the television receiver); and

(2) Unless service is rendered on a non-common carrier basis, the common carrier's tariff allows the subscriber the option of owning the receiving equipment (except for the decoder) so long as:

(i) The customer provides the type of equipment as specified in the tariff;

(ii) Such equipment is in suitable condition for the rendition of satisfactory service; and

(iii) Such equipment is installed, maintained, and operated pursuant to the common carrier's instructions and control.

(c) The carrier's tariff shall fully describe the parameters of the service to be provided, including the degree of privacy of communications a subscriber can expect in ordinary service. If the ordinary service does not provide for complete security of transmission, the tariff shall make provision for service with such added protection upon request.

(d) An MDS licensee also may alternate, without further authorization required, between rendering service on a common carrier and non-common carrier basis, provided that the licensee notifies the Commission of any service status changes at least 30 days in advance of such changes. The notification shall state whether there is any affiliation or relationship to any intended or likely subscriber or program originator.

[44 FR 60534, Oct. 19, 1979, as amended at 52 FR 27556, July 22, 1987; 61 FR 26676, May 28, 1996; 63 FR 65103, Nov. 25, 1998; 64 FR 4054, Jan. 27, 1999; 64 FR 63732, Nov. 22, 1999]

§ 21.904 EIRP limitations.

(a) The maximum EIRP of a main or booster station shall not exceed 33 dBW + 10log(X/6) dBW, where X is the actual bandwidth if other than 6 MHz, except as provided in paragraph (b) of this section.