

Proposed amendments to Part 24 of the Commission's Rules

§ 24.232 Power and antenna height limits.

(a) Fixed and base stations are limited to a maximum composite power of 1640 watts peak-equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraphs (b), (c) and (d) below. See § 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section. The service area boundary limit and microwave protection criteria specified in §§ 24.236 and 24.237 apply.

(b) Fixed and base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to a maximum composite power of 3280 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (d) below; See § 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 2 of this section. The service area boundary limit and microwave protection criteria specified in §§ 24.236 and 24.237 apply. Operation under this paragraph must be coordinated in advance with all PCS licensees within 120 kilometers (75 miles) of the base station and is limited to base stations located more than 120 kilometers (75 miles) from the Canadian border, and more than 75 kilometers (45 miles) from the Mexican border.

(c) Fixed and base stations employing a carrier bandwidth of 500 kHz or greater that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to 6560 watts EIRP per MHz of emission bandwidth with an antenna height up to 300 meters HAAT. See § 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power spectral density; see Table 2 of this section. Fixed and base stations transmitting from any other location are limited to a power spectral density of 3280 watts EIRP per MHz of emission bandwidth with an antenna height up to 300 meters HAAT. See § 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power spectral density; see Table 1 of this section.

(ed) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

(de) ~~Peak~~ Maximum composite transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true ~~peak~~ maximum composite measurement for the emission in question over the full bandwidth of the channel.

TABLE 1 -- REDUCED POWER FOR BASE STATION ANTENNA HEIGHTS
OVER 300 METERS

HAAT in meters	Maximum Composite Power (watts EIRP)	Maximum Power Spectral Density (watts/MHz)
≤ 300	1640	3280
≤ 500	1070	2140
≤ 1000	490	980
≤ 1500	270	540
≤ 2000	160	320

TABLE 2 -- REDUCED POWER FOR BASE STATION ANTENNA HEIGHTS
OVER 300 METERS

HAAT in meters	Maximum Composite Power (watts EIRP)	Maximum Power Spectral Density (watts/MHz)
≤ 300	3280	6560
≤ 500	2140	4280
≤ 1000	980	1960
≤ 1500	540	1080
≤ 2000	320	640

Proposed amendments to Part 27 of the Commission's Rules

§ 27.50 Power and antenna height limits.

(b) The following power and antenna height limits apply to transmitters operating in the 746-764 MHz and 776-794 MHz bands:

(1) Fixed and base stations transmitting in the 746-764 MHz and the 777-792 MHz bands must not exceed an effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT), except as described in paragraphs (2) and (3) below. ~~that a~~ Antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section.

(2) Fixed and base stations transmitting in the 746-764 MHz and the 777-792 MHz bands that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to 2000 watts ERP and an antenna height of 305 m HAAT, except as described in paragraph (3) below. Antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts ERP in accordance with Table 2 of this section.

(3) Fixed and base stations transmitting in the 746-764 MHz and the 777-792 MHz bands that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, and employ a carrier bandwidth of 500 kHz or greater are limited to a power spectral density of 4000 watts ERP per MHz of emission bandwidth and an antenna height of 305 m HAAT. Antenna heights greater than 305 m HAAT are permitted so long as the power spectral density does not exceed the limits specified in Table 2 of this section. Fixed and base stations transmitting in the 746-764 MHz and the 777-792 MHz bands from any other location are limited to a power spectral density of 2000 watts ERP per MHz of emission bandwidth and an antenna height of 305 m HAAT. Antenna heights greater than 305 m HAAT are permitted so long as the power spectral density does not exceed the limits specified in Table 1 of this section.

(24) Control stations and mobile stations transmitting in the 747-762 MHz band and the 776-794 MHz band and fixed stations transmitting in the 776-777 MHz band and the 792-794 MHz band are limited to 30 watts ERP;

(35) Portable stations (hand-held devices) transmitting in the 747-762 MHz band and the 776-794 MHz band are limited to 3 watts ERP;

(46) Maximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of an RMS-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true maximum composite measurement for the emission in question over the full bandwidth of the channel.

(c) The following power and antenna height requirements apply to stations transmitting in the 698-746 MHz band:

(1) Fixed and base stations transmitting in the 698-746 MHz band are limited to a maximum effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT) except as described in paragraphs (2), (3), and (4) below. Antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section.

(2) Fixed and base stations transmitting in the 698-746 MHz band that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to 2000 watts ERP and an antenna height of 305 m HAAT, except as described in paragraphs (3) and (4) below. Antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts ERP in accordance with Table 2 of this section.

(3) Fixed and base stations transmitting in the 698-746 MHz band that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, and employ a carrier bandwidth of 500 kHz or greater are limited to a power spectral density of 4000 watts ERP per MHz of emission bandwidth and an antenna height of 305 m HAAT. Antenna heights greater than 305 m HAAT are permitted so long as the power spectral density does not exceed the limits specified in Table 2 of this section. Fixed and base stations transmitting in the 698-746 MHz band from any other location are limited to a power spectral density of 2000 watts ERP per MHz of emission bandwidth and an antenna height of 305 m HAAT. Antenna heights greater than 305 m HAAT are permitted so long as the power spectral density does not exceed the limits specified in Table 1 of this section.

(4) Fixed and base stations transmitting in the 710-728 MHz and 740-746 MHz bands are limited permitted to operate up to a maximum effective radiated power (ERP) of 50 kW, with the following limitations on antenna heights as follows:

(i) Fixed and base stations with an ERP of 1000 watts or less must not exceed an antenna height of 305 m height above average terrain (HAAT) except when the power is reduced in accordance with Table 1 of this section; Licensees transmitting in these bands that operate a fixed or base station at a power level greater than 1 kW ERP must provide advanced notice of such operation to the Commission and to licensees authorized in their area of operation. Licensees that must be notified are all licensees authorized under this part to operate a base or fixed station on an adjacent spectrum block at a location within 75 km of the base or fixed station operating at a power level greater than 1 kW ERP. Notices must provide the location and operating parameters of the base or fixed station operating at a power level greater than 1 kW ERP, including the station's ERP, antenna coordinates, antenna height above ground, and vertical antenna pattern, and such notices must be provided at least 90 days prior to the commencement of station operation.

(ii) The antenna height for fixed and base stations with an ERP greater than 1000 watts but not exceeding 50 kW is limited only to the extent required to satisfy the requirements of §27.55(b).

(25) Control and mobile stations are limited to 30 watts ERP;

(36) Portable stations (hand-held devices) are limited to 3 watts ERP;

(47) Maximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of an RMS-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true maximum composite measurement for the emission in question over the full bandwidth of the channel.

~~(5) Licensees intending to operate a base or fixed station at a power level greater than 1 kW ERP must provide advanced notice of such operation to the Commission and to licensees authorized in their area of operation. Licensees that must be notified are all licensees authorized under this part to operate a base or fixed station on an adjacent spectrum block at a location within 75 km of the base or fixed station operating at a power level greater than 1 kW ERP. Notices must provide the location and operating parameters of the base or fixed station operating at a power level greater than 1 kW ERP, including the station's ERP, antenna coordinates, antenna height above ground, and vertical antenna pattern, and such notices must be provided at least 90 days prior to the commencement of station operation.~~

(d) The following power and antenna height requirements apply to stations transmitting in the 1710-1755 MHz and 2110-2155 MHz bands:

(1) The power of each fixed or base station transmitting in the 2110-2155 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to a maximum composite power of 3280 watts peak equivalent isotropically radiated power (EIRP) ~~of 3280 watts, except as described in paragraph (2)~~. The power of each fixed or base station transmitting in the 2110-2155 MHz band from any other location is limited to a maximum composite power of 1640 watts ~~a peak EIRP of 1640 watts, except as described in paragraph (2)~~. A licensee operating a base or fixed station utilizing a power of more than 1640 watts must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025-2110 MHz band. Operation above 1640 watts EIRP must also be coordinated in advance with the following licensees within 120 kilometers (75 miles) of the base or fixed station: all Broadband Radio Service (BRS) licensees authorized under part 27 in the 2155-2160 MHz band and all AWS licensees in the 2110-2155 MHz band.

(2) Fixed and base stations transmitting in the 2110-2155 MHz band that employ a carrier bandwidth of 500 kHz or greater and are located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to a power spectral density of 6560 watts per MHz of

emission bandwidth. Fixed and base stations transmitting in the 2110-2155 MHz band from any other location are limited to a power spectral density of 3280 watts per MHz of emission bandwidth. A licensee operating a base or fixed station utilizing a power spectral density of more than 3280 watts per MHz must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025-2110 MHz band. Operation above 3280 watts per MHz must also be coordinated in advance with the following licensees within 120 kilometers (75 miles) of the base or fixed station: all Broadband Radio Service (BRS) licensees authorized under part 27 in the 2155-2160 MHz band and all AWS licensees in the 2110-2155 MHz band.

(23) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to a peak EIRP of 1 watt. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.

(i) Peak Maximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true peak maximum composite measurement for the emission in question over the full bandwidth of the channel.

TABLE 1 -- PERMISSIBLE POWER AND ANTENNA HEIGHTS FOR BASE AND FIXED STATIONS IN THE 698-746 MHz AND 777-794 MHz BANDS

HAAT in meters (feet)	Maximum Composite Power (watts ERP)	Maximum Power Spectral Density (watts/MHz)
Above 1372 (4500)	65	130
Above 1220 (4000) to 1372 (4500)	70	140
Above 1067 (3500) to 1220 (4000)	75	150
Above 915 (3000) to 1067 (3500)	100	200
Above 763 (2500) to 915 (3000)	140	280
Above 610 (2000) to 763 (2500)	200	400
Above 458 (1500) to 610 (2000)	350	700
Above 305 (1000) to 458 (1500)	600	1200
Up to 305 (1000)	1000	2000

TABLE 2 -- PERMISSIBLE POWER AND ANTENNA HEIGHTS FOR BASE AND FIXED STATIONS IN THE 698-746 MHz AND 777-794 MHz BANDS

HAAT in meters (feet)	Maximum Composite Power (watts ERP)	Maximum Power Spectral Density (watts/MHz)
Above 1372 (4500)	130	260
Above 1220 (4000) to 1372 (4500)	140	280
Above 1067 (3500) to 1220 (4000)	150	300
Above 915 (3000) to 1067 (3500)	200	400
Above 763 (2500) to 915 (3000)	280	560
Above 610 (2000) to 763 (2500)	400	800
Above 458 (1500) to 610 (2000)	700	1400
Above 305 (1000) to 458 (1500)	1200	2400
Up to 305 (1000)	2000	4000

§ 27.55 Signal strength limits.

(b) *Power flux density limit.* For base and fixed stations operating in the ~~698-746~~ 710-728 MHz and 740-746 MHz bands, with an effective radiated power (ERP) greater than 1 kW, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 3000 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.