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base transmitters that transmit on the same channel. If a 932-933 MHz channel and a 941-942 MHz channel are assigned as a pair, the 941-942 MHz channel must be assigned only to control transmitters; the 932-933 MHz channel may be assigned to control or fixed relay transmitters.

(b) *470-512 MHz.* These channels may be assigned only individually (unpaired), to control transmitters that directly control at least four public mobile base transmitters that transmit on the same channel. Fixed relay transmitters are not authorized.

(c) *Selection and assignment.* The FCC selects and assigns a channel when granting applications for authorization to operate a new station to transmit in the 470-512, 932-933 and 941-942 MHz frequency ranges. Applicants having a preference may request the assignment of a specific channel or channel pair, but the FCC may in some cases be unable to satisfy such requests.

§ 22.625 Transmitter locations.

This section governs where point-to-multipoint transmitters on the channels listed in § 22.621 may be located.

(a) *928-960 MHz.* In this frequency range, the required minimum distance separation between co-channel fixed transmitters is 113 kilometers (70 miles).

(b) *470-512 MHz.* The purpose of the rule in paragraph (b)(1) of this section is to define the areas in which the 470-512 MHz channels are allocated for public mobile use. The purpose of the rules in paragraphs (b)(2) and (b)(3) of this section is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur.

(1) *Control transmitter locations.* Control transmitter locations must be within 80 kilometers (50 miles) of the designated locations in this paragraph.

Urban area	N. latitude	W. longitude
Boston, MA .....	42°21'24.4"	71°03'22.2"
Chicago, IL .....	41°52'28.1"	87°38'22.2"
Cleveland, OH .....	41°29'51.2"	81°41'49.5"
Dallas, TX .....	32°47'09.5"	96°47'38.0"
Detroit, MI .....	42°19'48.1"	83°02'56.7"
Houston, TX .....	29°45'26.8"	95°21'37.8"
Los Angeles, CA .....	34°03'15.0"	118°14'31.3"
Miami, FL .....	25°46'38.6"	80°11'31.2"
New York, NY .....	40°45'6.4"	73°59'37.5"
Philadelphia, PA .....	39°56'58.4"	75°09'19.6"

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Urban area	N. latitude	W. longitude
Pittsburgh, PA .....	40°26'19.2"	79°59'59.2"
San Francisco-Oakland, CA ..	37°46'38.7"	122°24'43.9"
Washington, DC .....	38°53'51.4"	77°00'31.9"

NOTE: Coordinates are referenced to North American Datum 1983 (NAD 83).

(2) *Protection from intermodulation interference.* Control transmitter locations must be at least 1.6 kilometers (1 mile) from the main transmitter locations of all TV stations transmitting on TV channels separated by 2, 3, 4, 5, 7, or 8 TV channels from the TV channel containing the frequencies on which the control station will transmit. This requirement is intended to reduce the likelihood of intermodulation interference.

(3) *Co-channel protection from control transmitters with high antennas.* This paragraph applies only to control transmitters that utilize an antenna height of more than 152 meters (500 feet) above average terrain. The distance between the location of such a control transmitter and the applicable protected TV station location specified in this paragraph must equal or exceed the sum of the distance from the control transmitter location to the radio horizon in the direction of the specified location and 89 kilometers (55 miles—representing the distance from the main transmitter location of the TV station to its Grade B contour in the direction of the control transmitter). The protected TV station locations in this paragraph are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(i) The protected TV station locations are as follows:

Control transmitter frequency range	Protected TV station location
470-476 MHz.	Washington, DC 38°57'17" 77°00'17"
476-482 MHz.	Lancaster, PA 40°15'45" 76°27'49"

(ii) The distance to the radio horizon is calculated using the following formula:

$$d = \sqrt{17 \times h}$$

where

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d is the distance to the radio horizon in kilometers

h is the height of the antenna center of radiation above ground level in meters

[59 FR 59507, Nov. 17, 1994, as amended at 63 FR 68946, Dec. 14, 1998, 70 FR 19309, Apr. 13, 2005]

§ 22.627 Effective radiated power limits.

The effective radiated power (ERP) of transmitters operating on the channels listed in § 22.621 must not exceed the limits in this section.

(a) *Maximum ERP.* The ERP must not exceed the applicable limits in this paragraph under any circumstances.

Frequency range (MHz)	Maximum ERP (watts)
470–512 .....	1000
928–929 .....	50
932–933 .....	30
941–942 .....	600
952–960 .....	150

(b) *470–512 MHz limits.* The purpose of the rules in paragraphs (b)(1) through (b)(3) of this section is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur. The protected TV station locations specified in this section are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(1) *Co-channel protection.* The ERP of control transmitters must not exceed the limits in the tables in paragraphs (b)(1)(ii) and (b)(1)(iii) of this section. The limits depend upon the height above average terrain of the control transmitter antenna and the distance between the control transmitter and the nearest protected TV station location in paragraph (b)(1)(i) of this section.

(i) The protected TV station locations are as follows (all coordinates are referenced to North American Datum 1983 (NAD83)):

Control transmitter frequency range	Protected TV station location
470–476 MHz ..	Jacksonville, IL, 39°45'52.2" N. Lat. 90°30'29.5" W. Long. Mt. Pleasant, MI, 43°34'24.1" N. Lat. 84°46'21.1" W. Long.

Control transmitter frequency range	Protected TV station location
476–482 MHz ..	Oxford, OH, 39°30'26.2" N. Lat. 84°44'8.8" W. Long.
482–488 MHz ..	Washington, DC, 38°57'17.4" N. Lat. 77°00'15.9" W. Long.
488–494 MHz ..	Champaign, IL, 40°04'11.1" N. Lat. 87°54'45.1" W. Long.
494–500 MHz ..	Madison, WI, 43°03'01.0" N. Lat. 89°29'15.4" W. Long.
500–506 MHz ..	Parkersburg, WV, 39°20'50.3" N. Lat. 81°33'55.5" W. Long.
506–512 MHz ..	Fort Wayne, IN, 41°05'35.2" N. Lat. 85°10'41.9" W. Long.
	Lancaster, PA, 40°15'45.3" N. Lat. 76°27'47.9" W. Long.
	South Bend, IN, 41°36'26.2" N. Lat. 86°27'48.1" W. Long.
	Philadelphia, PA, 40°02'30.4" N. Lat. 75°14'22.6" W. Long.
	None.
	Johnstown, PA, 40°19'47.3" N. Lat. 78°53'44.1" W. Long.
	Washington, DC, 38°57'49.4" N. Lat. 77°06'16.9" W. Long.
	Waterbury, CT, 41°31'2.3" N. Lat. 73°00'58.4" W. Long.

(ii) Table E-3 and E-4 apply to control transmitters in the New York-Northeastern New Jersey and Cleveland urban areas that transmit on channels in the 476–482 MHz range and to control transmitters in the Detroit urban area that transmit on channels in the 482–488 MHz range.

(iii) Tables E-5 and E-6 apply to all control transmitters except those to which Tables E-3 and E-4 apply.

(2) *Adjacent channel protection.* The ERP of control transmitters must not exceed the limits in Table E-7. The limits depend upon the height above average terrain of the control transmitter antenna and the distance between the control transmitter and the nearest protected TV station location listed in this paragraph. The protected TV station locations are as follows (all coordinates are referenced to North American Datum 1983 (NAD83)):

Control transmitter frequency range	Protected TV station location	TV channel
470–476 MHz.	Hanover, NH, 43°42'30.3" N. Lat. 72°09'14.3" W. Long..	(15)
	Madison, WI, 43°03'01.0" N. Lat. 89°29'15.4" W. Long..	(15)
	Champaign, IL, 40°04'11.1" N. Lat. 87°54'45.1" W. Long..	(15)
	San Diego, CA, 32°41'48.2" N. Lat. 116°56'13.1" W. Long..	(15)
	Lancaster, PA, 40°15'45.3" N. Lat. 76°27'47.9" W. Long..	(15)