must be notified again when service resumes.

[69 FR 32880, June 14, 2004]

Subpart D—Technical Requirements

§ 87.131 Power and emissions.

The following table lists authorized emissions and maximum power. Power must be determined by direct measurement.

Class of station	Frequency band/ frequency	Authorized emission(s) [9]	Maximum power [1]
Aeronautical advisory	VHF	A3E	10 watts. [10]
Aeronautical multicom	VHF	A3E	10 watts.
Aeronautical enroute and aeronautical fixed.	HF	R3E, H3E, J3E, J7B, H2B, J2D	6 kw.
	HF	A1A, F1B, J2A, J2B	1.5 kw.
	VHF	A3E, A9W G1D, A2D.	
Aeronautical search and rescue	VHF	A3E	10 watts.
	HF	R3E, H3E, J3E	100 watts.
Operational fixed	VHF	G3E, F2D	30 watts.
Flight test land	VHF	A3E	200 watts.
	UHF	F2D, F9D, F7D	25 watts. [3]
	HF	H2B, J3E, J7D, J9W	6.0 kw.
Aviation support	VHF	A3E	50 watts.
Airport control tower	VHF	A3E, G1D, G7D	50 watts.
	Below 400 kHz	A3E	15 watts.
Aeronautical utility mobile	VHF	A3E	10 watts.
	1090 MHz	M1D	20 watts.
Aircraft data link land test	131.450 MHz, 131.550 MHz, 131.725 MHz, 131.825 MHz, 136.850 MHz.	A2D	100 microwatts.
	136.900 MHz, 136.925 MHz, 136.950 MHz, 136.975 MHz.	G1D	100 microwatts.
Radionavigation land test	108.150 MHz	A9W	1 milliwatt.
	334.550 MHz	A1N	1 milliwatt.
	Other VHF	M1A, XXA, A1A, A1N, A2A, A2D, A9W	1 watt.
	Other UHF	M1A, XXA, A1A, A1N, A2A, A2D, A9W	1 watt.
	5031.0 MHz	F7D	1 watt.
Radionavigation land	Various [4]	Various [4]	Various. [4]
	Aeronautical Frequencies		
Aircraft (Communication)	UHF	F2D, F9D, F7D	25 watts.
	VHF	A3E, A9W, G1D, G7D, A2D	55 watts.
	HF	R3E, H3E, J3E, J7B, H2B, J7D, J9W	400 watts.
	HF	A1A, F1B, J2A, J2B	100 watts.
	Marine Frequencies [5]		
	156.300 MHz	G3E	5 watts.
	156.375 MHz	G3E	5 watts.
	156.400 MHz	G3E	5 watts.
	156.425 MHz	G3E	5 watts.
	156.450 MHz	G3E	5 watts.
	156.625 MHz	G3E	5 watts.
	156.800 MHz	G3E	5 watts.
	156.900 MHz	G3E	5 watts.
	157.425 MHz	G3E	5 watts.
	HF [6]	R3E, H3E, J3E, J2B, F1B, A3E	1000 watts. 250 watts.
	MF [6]	R3E, H3E, J3E, J2B, F1B	1000 watts.
	HF [6]	A3E	250 watts.
(Radionavigation)	Various [7]	Various [7]	Various. [7]
Aircraft earth	UHF	G1D, G1E, G1W	60 watts. [8]
Differential GPS	VHF	G7D	Various. [2]

[1] The power is measured at the transmitter output terminals and the type of power is determined according to the emission designator as follows:
(i) Mean power (pY) for amplitude modulated emissions and transmitting both sidebands using unmodulated full carrier.

(ii) Peak envelope power (pX) for all emission designators other than those referred to in paragraph (i) of this note.
[2] Power and antenna height are restricted to the minimum necessary to achieve the required service.
[3] Transmitter power may be increased to overcome line and duplexer losses but must not exceed 25 watts delivered to the antenna.
[4] Frequency, emission, and maximum power will be determined after coordination with appropriate Government agencies.
[5] To be used with airborne marine equipment certificated for part 80 (ship) and used in accordance with part 87.
[6] Applicable only to marine frequencies used for public correspondence.
[7] Frequency, emission, and maximum power will be determined by appropriate standards during the certification process.
[8] Power may not exceed 60 watts per carrier, as measured at the input of the antenna subsystem, including any installed diplexer. The maximum EIRP may not exceed 2000 watts per carrier.
[9] Excludes automatic link establishment.
[10] Power is limited to 0.5 watt, but may not exceed 2 watts when station is used in an automatic unattended mode.

[54 FR 11720, Mar. 22, 1989, as amended at 57 FR 45749, Oct. 5, 1992; 62 FR 40308, July 28, 1997; 63 FR 36607, July 7, 1998; 64 FR 27474, May 20, 1999; 66 FR 26798, May 15, 2001; 69 FR 32880, June 14, 2004; 78 FR 61205, Oct. 3, 2013]

§ 87.133 Frequency stability.

(a) Except as provided in paragraphs (c), (d), (f), and (g) of this section, the carrier frequency of each station must be maintained within these tolerances:

Frequency band (lower limit exclusive, upper limit inclusive), and categories of stations	Tolerance [1]	Tolerance [2]
(1) Band-9 to 535 kHz:		
Aeronautical stations	100	100
Aircraft stations	200	100
Survival craft stations on 500 kHz.	5,000	20 Hz [3]
Radionavigation stations	100	100
(2) Band-1605 to 4000 kHz:		
Aeronautical fixed stations:		
Power 200 W or less	100	100 [8]
Power above 200 W	50	50 [8]
Aeronautical stations:		
Power 200 W or less	100 [7]	100 [7 8]
Power above 200 W	50 [7]	50 [7 8]
Aircraft stations	100 [7]	100 [7]
Survival craft stations on 2182 kHz.	200	20 Hz [3]
(3) Band-4 to 29.7 MHz:		
Aeronautical fixed stations:		
Power 500 W or less	50	
Power above 500 W	15	
Single-sideband and Independent-sideband emission:		
Power 500 W or less		50 Hz
Power above 500 W		20 Hz
Class F1B emissions		10 Hz
Other classes of emission:		
Power 500 W or less		20
Power above 500 W		10
Aeronautical stations:		
Power 500 W or less	[7] 100	100 [7]
Power above 500 W	[7] 50	50 [7]
Aircraft stations	[7] 100	100 [7]
Survival craft stations on 8364 kHz.	200	50 Hz [3]
(4) Band-29.7 to 100 MHz:		
Aeronautical fixed stations:		
Power 200 W or less	50	
Power above 200 W	30	
Power 50 W or less		30
Power above 50 W		20
Operational fixed stations:		
73–74.6 MHz (Power 50 W or less).	50	30
73–74.6 MHz (Power above 50 W).	20	20
72–73.0 MHz and 75.4–76.0 MHz.	5	5
Radionavigation stations	100	50
(5) Band-108 to 137 MHz:		
Aeronautical stations	[4] 50	[12] 20
Emergency locator transmitter test stations.	50	50
Survival craft stations on 121.5 MHz.	50	50
Emergency locator stations	50	50
Aircraft and other mobile stations in the Aviation Services.	[5] 50	[13] 30
Radionavigation stations	20	20
Differential GPS		2
(6) Band-137 to 470MHz:		
Aeronautical stations	50	20
Survival craft stations on 243 MHz.	50	50
Aircraft stations	50 [5]	30 [10]
Radionavigation stations	50	50
Emergency locator transmitters on 406 MHz.	N/A	5
(7) Band-470 to 2450 MHz:		
Aeronautical stations	100	20
Aircraft stations	100	20
Aircraft earth station		320 Hz [11]
Aeronautical utility mobile stations on 1090 MHz.	1000	1000
Radionavigation stations:		
470–960 MHz	500	500
960–1215 MHz	20	20
1215–2450 MHz	500	500
(8) Band-2450 to 10500 MHz:		
Radionavigation stations	[6 9] 1250	1250 [6 9]
(9) Band-10.5 GHz to 40 GHz:		
Radionavigation stations	5000	5000

[1] This tolerance is the maximum permitted until January 1, 1990, for transmitters installed before January 2, 1985, and used at the same installation. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).
[2] This tolerance is the maximum permitted after January 1, 1985 for new and replacement transmitters and to all transmitters after January 1, 1990. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).
[3] For transmitters first approved after November 30, 1977.
[4] The tolerance for transmitters approved between January 1, 1966, and January 1, 1974, is 30 parts in 10^6. The tolerance for transmitters approved after January 1, 1974, and stations using offset carrier techniques is 20 parts in 10^6.
[5] The tolerance for transmitters approved after January 1, 1974, is 30 parts in 10^6.
[6] In the 5000 to 5250 MHz band, the FAA requires a tolerance of ±10 kHz for Microwave Landing System stations which are to be a part of the National Airspace System (FAR 171).