

§ 23.1391

axis of the airplane and perpendicular to the plane of symmetry of the airplane) must equal or exceed the values in § 23.1391.

(2) *Intensities in any vertical plane.* Each intensity in any vertical plane (the plane perpendicular to the horizontal plane) must equal or exceed the appropriate value in § 23.1393, where *I* is the minimum intensity prescribed in § 23.1391 for the corresponding angles in the horizontal plane.

(3) *Intensities in overlaps between adjacent signals.* No intensity in any overlap between adjacent signals may exceed the values in § 23.1395, except that higher intensities in overlaps may be used with main beam intensities substantially greater than the minima specified in §§ 23.1391 and 23.1393, if the overlap intensities in relation to the main beam intensities do not adversely affect signal clarity. When the peak intensity of the left and right position lights is more than 100 candles, the maximum overlap intensities between them may exceed the values in § 23.1395 if the overlap intensity in Area A is not more than 10 percent of peak position light intensity and the overlap intensity in Area B is not more than 2.5 percent of peak position light intensity.

(c) *Rear position light installation.* A single rear position light may be installed in a position displaced laterally from the plane of symmetry of an airplane if—

(1) The axis of the maximum cone of illumination is parallel to the flight path in level flight; and

(2) There is no obstruction aft of the light and between planes 70 degrees to the right and left of the axis of maximum illumination.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-43, 58 FR 18977, Apr. 9, 1993]

**§ 23.1391 Minimum intensities in the horizontal plane of position lights.**

Each position light intensity must equal or exceed the applicable values in the following table:

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Dihedral angle (light included)	Angle from right or left of longitudinal axis, measured from dead ahead	Intensity (candles)
L and R (red and green) ....	0° to 10° .....	40
	10° to 20° .....	30
	20° to 110° .....	5
A (rear white) .....	110° to 180° .....	20

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-43, 58 FR 18977, Apr. 9, 1993]

**§ 23.1393 Minimum intensities in any vertical plane of position lights.**

Each position light intensity must equal or exceed the applicable values in the following table:

Angle above or below the horizontal plane	Intensity, <i>I</i>
0° .....	1.00
0° to 5° .....	0.90
5° to 10° .....	0.80
10° to 15° .....	0.70
15° to 20° .....	0.50
20° to 30° .....	0.30
30° to 40° .....	0.10
40° to 90° .....	0.05

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-43, 58 FR 18977, Apr. 9, 1993]

**§ 23.1395 Maximum intensities in overlapping beams of position lights.**

No position light intensity may exceed the applicable values in the following equal or exceed the applicable values in § 23.1389(b)(3):

Overlaps	Maximum intensity	
	Area A (candles)	Area B (candles)
Green in dihedral angle <i>L</i> .....	10	1
Red in dihedral angle <i>R</i> .....	10	1
Green in dihedral angle <i>A</i> .....	5	1
Red in dihedral angle <i>A</i> .....	5	1
Rear white in dihedral angle <i>L</i> .....	5	1
Rear white in dihedral angle <i>R</i> .....	5	1

Where—

(a) Area A includes all directions in the adjacent dihedral angle that pass through the light source and intersect the common boundary plane at more than 10 degrees but less than 20 degrees; and

(b) Area B includes all directions in the adjacent dihedral angle that pass through the light source and intersect

the common boundary plane at more than 20 degrees.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-43, 58 FR 18977, Apr. 9, 1993]

**§23.1397 Color specifications.**

Each position light color must have the applicable International Commission on Illumination chromaticity coordinates as follows:

(a) *Aviation red*—

“y” is not greater than 0.335; and  
“z” is not greater than 0.002.

(b) *Aviation green*—

“x” is not greater than  $0.440 - 0.320 y$ ;  
“x” is not greater than  $y - 0.170$ ; and  
“y” is not less than  $0.390 - 0.170 x$ .

(c) *Aviation white*—

“x” is not less than 0.300 and not greater than 0.540;

“y” is not less than “ $x - 0.040$ ” or “ $y_0 - 0.010$ ,” whichever is the smaller; and  
“y” is not greater than “ $x + 0.020$ ” nor “ $0.636 - 0.400 x$ ”;

Where “ $y_0$ ” is the “y” coordinate of the Planckian radiator for the value of “x” considered.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, amended by Amdt. 23-11, 36 FR 12971, July 10, 1971]

**§23.1399 Riding light.**

(a) Each riding (anchor) light required for a seaplane or amphibian, must be installed so that it can—

(1) Show a white light for at least two miles at night under clear atmospheric conditions; and

(2) Show the maximum unbroken light practicable when the airplane is moored or drifting on the water.

(b) Externally hung lights may be used.

**§23.1401 Anticollision light system.**

(a) *General.* The airplane must have an anticollision light system that:

(1) Consists of one or more approved anticollision lights located so that their light will not impair the flight crewmembers' vision or detract from the conspicuity of the position lights; and

(2) Meets the requirements of paragraphs (b) through (f) of this section.

(b) *Field of coverage.* The system must consist of enough lights to illuminate

the vital areas around the airplane, considering the physical configuration and flight characteristics of the airplane. The field of coverage must extend in each direction within at least 75 degrees above and 75 degrees below the horizontal plane of the airplane, except that there may be solid angles of obstructed visibility totaling not more than 0.5 steradians.

(c) *Flashing characteristics.* The arrangement of the system, that is, the number of light sources, beam width, speed of rotation, and other characteristics, must give an effective flash frequency of not less than 40, nor more than 100, cycles per minute. The effective flash frequency is the frequency at which the airplane's complete anticollision light system is observed from a distance, and applies to each sector of light including any overlaps that exist when the system consists of more than one light source. In overlaps, flash frequencies may exceed 100, but not 180, cycles per minute.

(d) *Color.* Each anticollision light must be either aviation red or aviation white and must meet the applicable requirements of §23.1397.

(e) *Light intensity.* The minimum light intensities in any vertical plane, measured with the red filter (if used) and expressed in terms of “effective” intensities, must meet the requirements of paragraph (f) of this section. The following relation must be assumed:

$$I_e = \frac{\int_{t_1}^{t_2} I(t) dt}{0.2 + (t_2 - t_1)}$$

where:

$I_e$  = effective intensity (candles).

$I(t)$  = instantaneous intensity as a function of time.

$t_2 - t_1$  = flash time interval (seconds).

Normally, the maximum value of effective intensity is obtained when  $t_2$  and  $t_1$  are chosen so that the effective intensity is equal to the instantaneous intensity at  $t_2$  and  $t_1$ .

(f) *Minimum effective intensities for anticollision lights.* Each anticollision light effective intensity must equal or exceed the applicable values in the following table.