

# KP INDEX



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## KP INDEX RANGE

The Kp index indicates the global activity of geomagnetic storms linked to solar activity. The quality of satellite reception could be affected and the geographical positioning of drones could be affected.

**The quality of reception of satellites used by drones as piloting aids can be affected by solar activity and magnetic storms.**



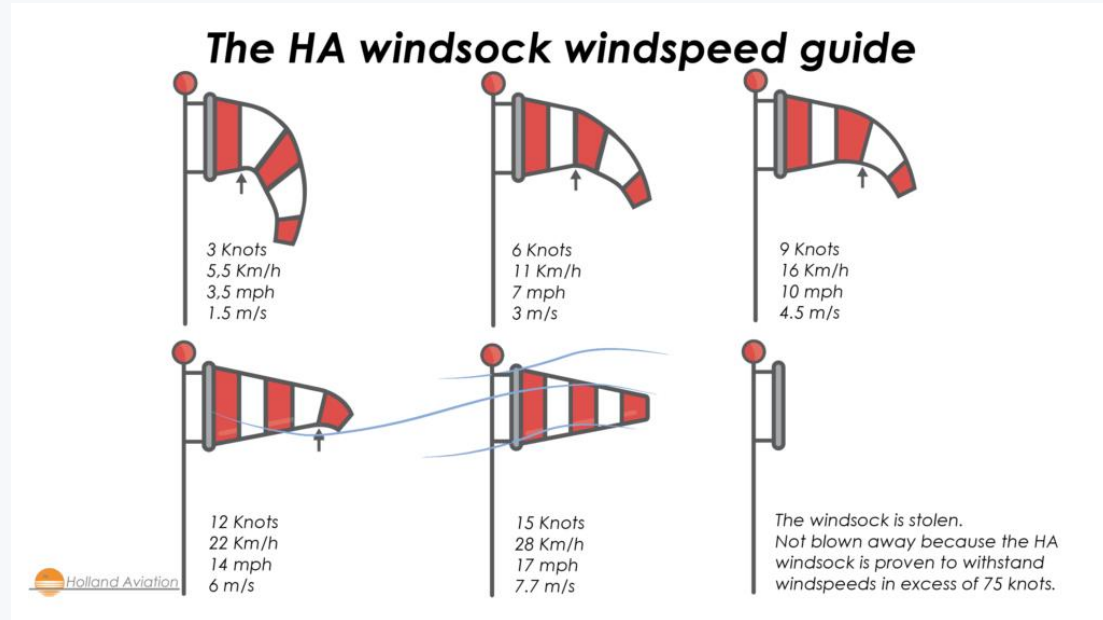


# WINDS AND GUSTS

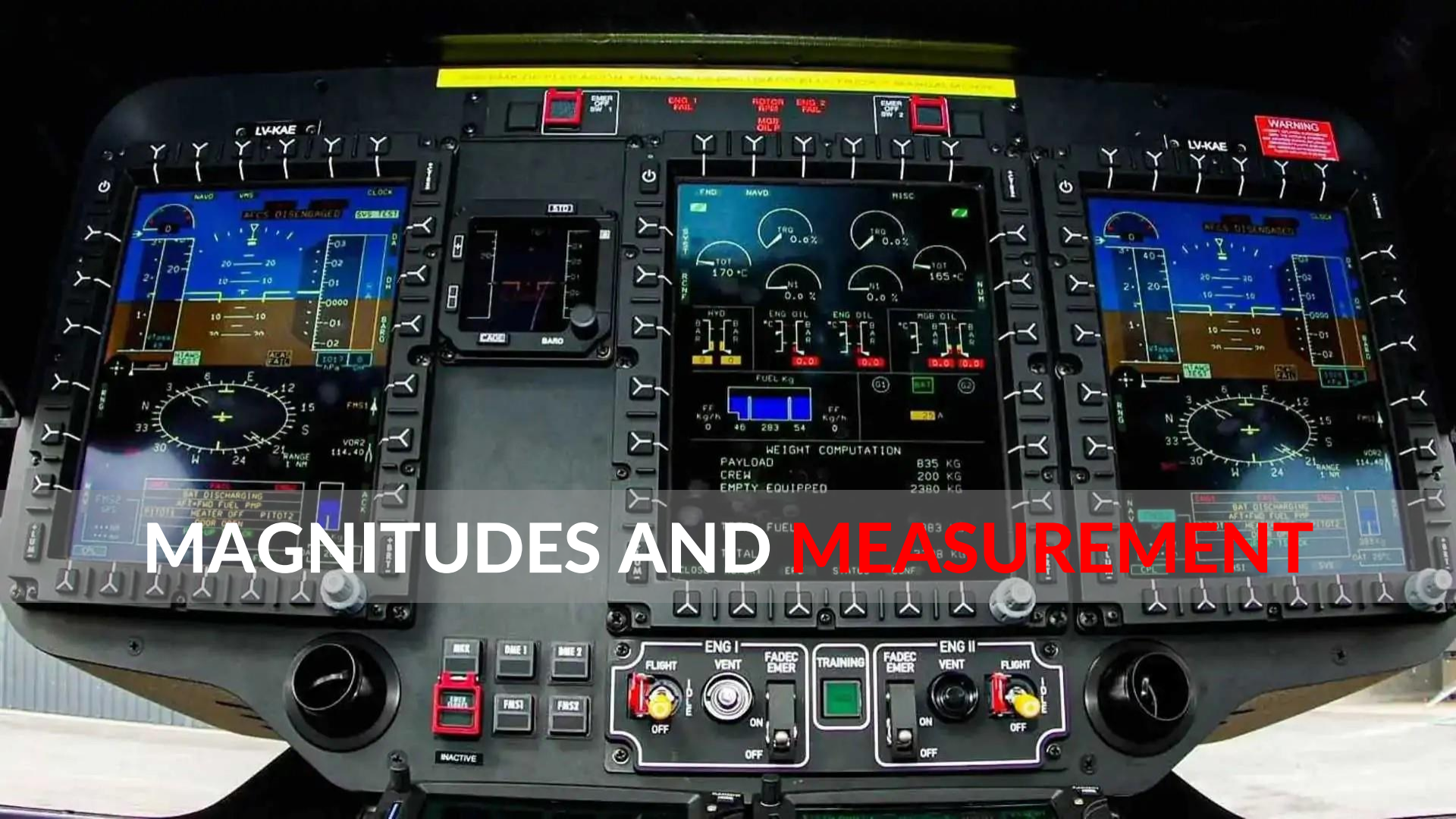
# BEAUFORT SCALE

The Beaufort scale of wind strength is an empirical measure of wind intensity based primarily on the state of the sea, its waves, and wind strength.

Beaufort Number	Description	Wind speed	Wave height	Sea conditions	Land conditions
0	Calm	< 1 knot < 1 mph < 2 km/h	0 ft 0 m	Sea like a mirror	Smoke rises vertically
1	Light air	1-3 knots 1-3 mph 2-5 km/h	0-1 ft 0-0.3 m	Ripples	Direction shown by smoke drift
2	Light breeze	4-6 knots 4-7 mph 6-11 km/h	1-2 ft 0.3-0.6 m	Small wavelets	Wind felt on face
3	Gentle breeze	7-10 knots 8-12 mph 12-19 km/h	2-4 ft 0.6-1.2 m	Large wavelets	Leaves and small twigs in constant motion
4	Moderate breeze	11-16 knots 13-18 mph 20-28 km/h	3.5-6 ft 1-2 m	Small waves	Raises dust and loose paper
5	Fresh breeze	17-21 knots 19-24 mph 29-38 km/h	6-10 ft 2-3 m	Moderate waves	Small trees and leaves begin to sway
6	Strong breeze	22-27 knots 25-31 mph 39-49 km/h	9-13 ft 3-4 m	Large waves	Large branches in motion
7	High wind, moderate gale, near gale	28-33 knots 32-38 mph 50-61 km/h	13-19 ft 4-5.5 m	Sea heaps up	Whole trees in motion
8	Gale, fresh gale	34-40 knots 39-46 mph 62-74 km/h	18-25 ft 5.5-7.5 m	Moderately high waves	Twigs break off trees
9	Strong/severe gale	41-47 knots 47-54 mph 75-88 km/h	23-32 ft 7-10 m	High waves	Slight structural damage
10	Storm, whole gale	48-55 knots 55-63 mph 89-102 km/h	29-41 ft 9-12.5 m	Very high waves	Trees uprooted, considerable structural damage
11	Violent storm	56-63 knots 64-72 mph 103-117 km/h	37-52 ft 11.5-16 m	Exceptionally high waves	Widespread damage
12	Hurricane force	≥ 64 knots ≥ 73 mph ≥ 118 km/h	≥ 46 ft ≥ 14 m	Exceptionally high waves, sea is completely white	Devastation



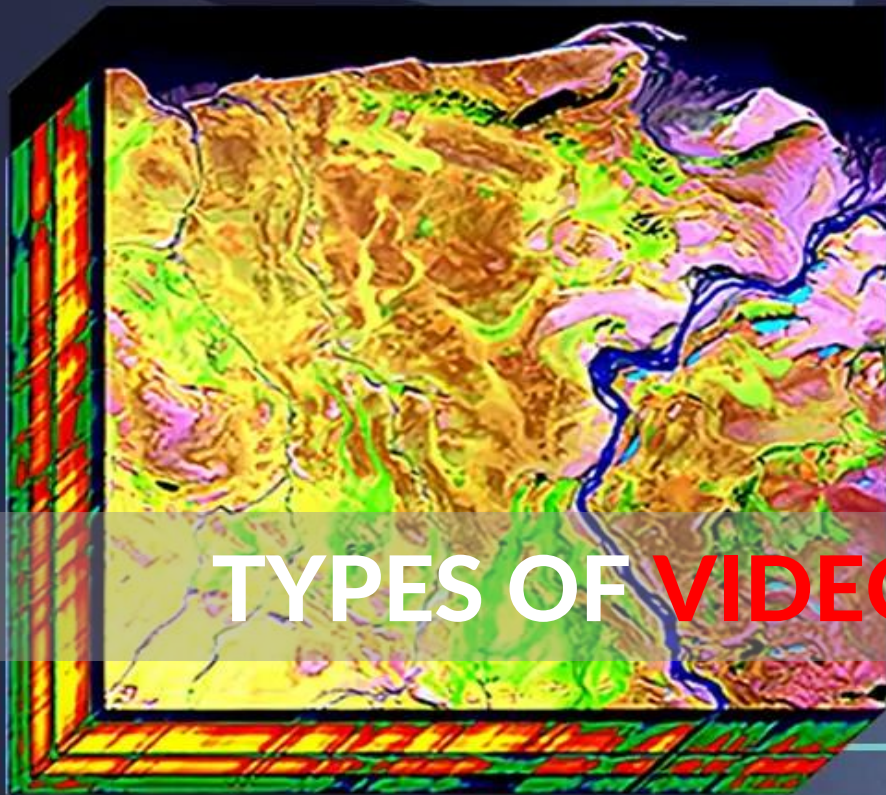
# MAGNITUDES AND MEASUREMENT



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Magnitudes and units of measurement used (Approximate):

Distances or Height	<b>1 FEET = 0,3048 METERS</b> Ex: 400 feet = 121.92 meters
Aircraft Speed	<b>1 Nautical Mile (nMile) = 1,85 Km</b> Ex: 10 nM/h = 18,5 Km/h
Wind Speed	<b>1 knot = 1,85 Km/h</b> Ex: 10 knots = 18,51 Km/h
Pressure	<b>1 atmosphere = 1013.25 hPA</b> Normal atmospheric pressure at sea level



# TYPES OF VIDEO CAMERAS



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## RGB TYPE

(CMOS - CCD - Foveon)  
Red - Green - Blue



## THERMAL

(Infrared - Thermographic)  
FLIR - FLUKE - VEVOR



## MULTIESPECTRAL

Micasense - Parrot - Axiom Optics



## HIPERESPECTRAL

Specim - Pika - OrangeEye



# IMAGES OF VIDEO CAMERAS

## THERMAL



## RGB vs. MULTIESPECTRAL



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# DECOMPOSITION OF LIGHT



*EXPERIMENTUM CRUCIS OR CRUCIAL EXPERIMENT*

In 1664, Isaac Newton went to a rural fair near Cambridge, England, and bought a pair of prisms. With them, a ray of sunlight, and his ingenuity, he unraveled a mystery that had puzzled generations of scientists: the nature of light.

In a very dark room, in a round hole approximately a third of an inch wide, I placed a glass prism through which the ray of sunlight entering through that hole could be refracted onto the opposite wall of the chamber and there form a colored image,' wrote Newton. He made a diagram with pen and ink on the back of a piece of paper on which he had taken notes that had nothing to do with light, not even with science, but with theology and his thoughts on the Old Testament.

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# THE COLORS “VIBRATE”

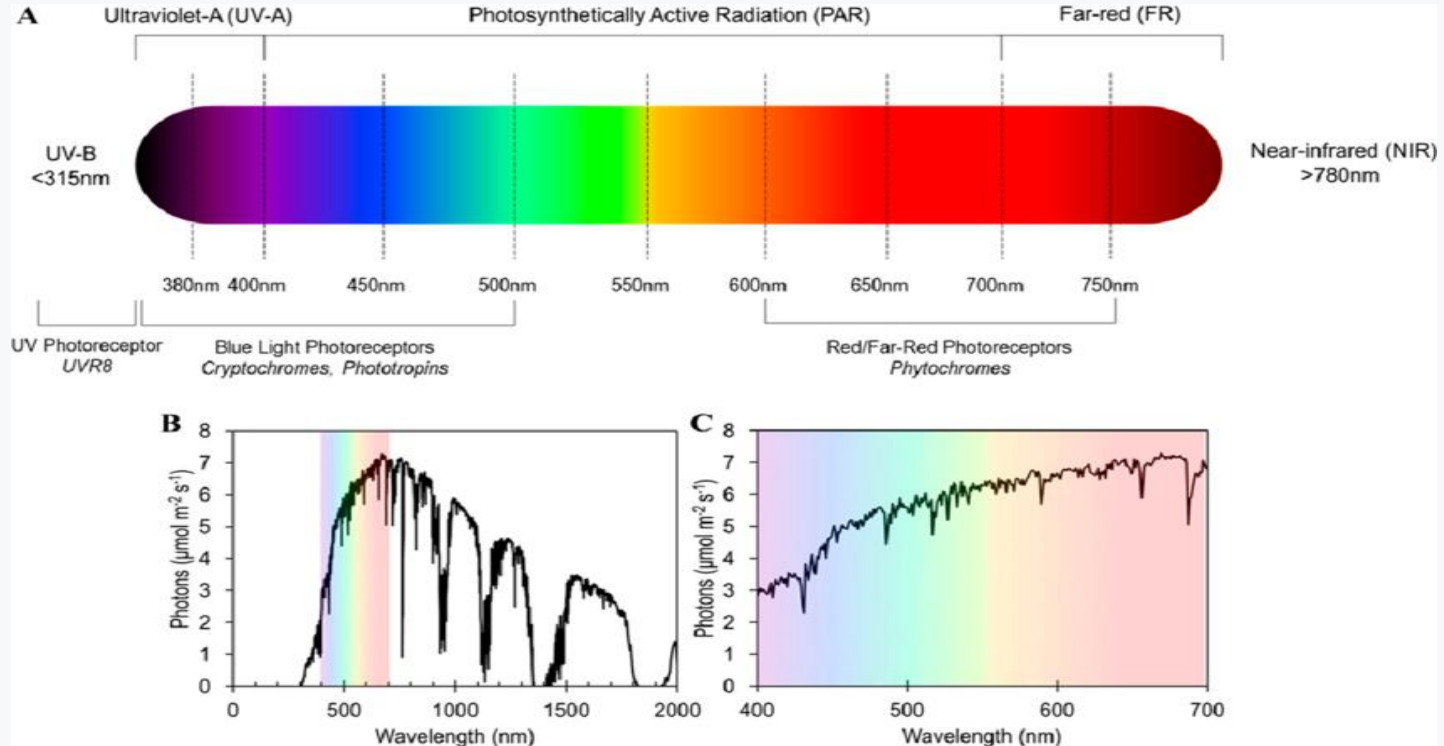
“If you want to understand the Universe, think about energy, frequency, and vibration.” Nikola Tesla

Objects do not have color. What they actually do is reflect the wavelengths of light, and it is the human brain that interprets them as colors.

The visible spectrum for humans ranges between violet light and red light, and it is estimated that humans can distinguish up to 10 million colors. When light strikes an object, the object absorbs part of that light and reflects the rest, which enters the human eye through the cornea, the outermost part of the eye. The cornea bends the light towards the pupil, which regulates the amount of light that reaches the lens. The lens, in turn, focuses the light onto the retina, the layer of nerve cells located at the back of the eye.

Color	Wavelength interval	Frequency interval
violet	~ 430 to 380 nm	~ 700 to 790 THz
blue	~ 500 to 430 nm	~ 600 to 700 THz
cyan	~ 520 to 500 nm	~ 580 to 600 THz
green	~ 565 to 520 nm	~ 530 to 580 THz
yellow	~ 590 to 565 nm	~ 510 to 530 THz
orange	~ 625 to 590 nm	~ 480 to 510 THz
red	~ 740 to 625 nm	~ 405 to 480 THz

# ELECTROMAGNETIC SPECTRUM OF LIGHT



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**QUESTION TIME!**