

# Why are there so many planes in the sky at the same time but they never collide with each other?

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1. Why do people often choose white to paint airplanes rather than other colors?
2. Why does the phone have to be in flight mode when taking off and landing?

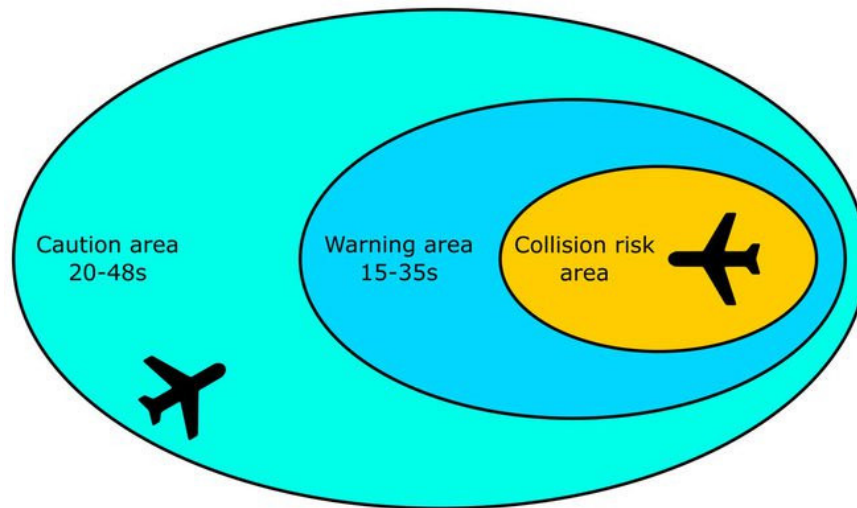


Like the street on the ground, airplanes that fly along a certain street are called **airways** . To ensure that the two planes are never at the same height, and keep a safe distance, the flights are controlled at different high levels - called **flight levels** .

As a rule: All aviation vehicles must be separated within 14km and 300m high.

With sophisticated radar systems and computer systems, air traffic will help aircraft to be separated from each other when taking off, landing, changing height or changing safety routes.

In addition, another factor that helps aircraft avoid such unfortunate collisions is **the Traffic Collision Alert System (TCAS)** - a relatively simple but intelligent radar system. Since the early 1990s in the United States and since 2000 in Europe, all passenger aircraft are required to equip this system to take off.



Early warning diagram of aircraft crash.

The aircraft constantly updates its position, altitude, speed and direction . through radio waves. If the aircraft's TCAS receives a signal from another aircraft, it will "exchange information" with each other to know how far apart they are based on the time it takes to receive a response.

Through the antenna system, the system will determine what information the other planes are coming from and calculate possible dangerous situations. All information will be displayed on a screen of aircraft around so that pilots can monitor the situation.

In the case of an aircraft preparing to cross the safety zone of another aircraft, two units of their TCAS will start working to give a warning.

From 20 to 48 seconds compared to the risk of collisions, a related voice warns "traffic traffic!" will emit in the cockpit. Pilots will see the intrusion plane displayed yellow on the screen and they will quickly look outside to find light or clues.

Within 20 to 25 seconds before collisions - TCAS offers ways to solve problems. Two units of TCAS and other systems that automatically work together will help the pilot know what to do: lower, climb or change other routes. Meanwhile, pilots will follow the instructions of the TCAS even if it conflicts with the air traffic controller.



The TCAS system indicates an instruction for the pilot to take the plane up or down, never turn left or right. By law, when the pilot finds that the aircraft is about to collide, they must turn right.

The plane's direction is easy to detect: the right wing has a green light and the left wing has a red light. The plane from right to left has lines and displays red light, on the contrary from left to right there will be a green light for other planes to see. It is a basic visual system, so that pilots can react properly in the worst case scenario.

In order for the aircraft to never collide with each other, the aviation industry is constantly seeking solutions to improve safety standards.

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