

# EION BYTES

## What is the Problem between 5G and Airlines



???

### What is Radio Altimeter (Radar Altimeter)?

Radio Altimeter or Radar Altimeter is a device used on planes to measure the distance from the plane to the objects on the ground. Sometimes it is abbreviated as RALT.

Primarily it is used below 1500 meters. The RALT is reliable and is a relatively simple device. It is basically RADAR in the 4.2 to 4.5 GHz range. Generally, Like RADAR, sweeping 400 to 440 MHz of the spectrum to get an accurate measurement from the ground to the plane. It measures the actual distance using the delay of the RF leaving the antenna then coming back. It works by shooting RF (a beacon) down to the earth and reading the information it receives. Remember that RF travels at the speed of light so this happens very quickly. So quick that the plane won't go far before it has a response. The way it knows the distance is by looking at the delay from the time the beacon was sent until it is received again. Generally, it can only see what is below it, not what's ahead.

The RALT uses the Frequency Modulated Continuous Wave (FMCW) scheme because it is capable of achieving the low altitude accuracy required with a simple and reliable system. The Standard output power of the RALT could be from 400 mW to 5 Watt. This is very low power.

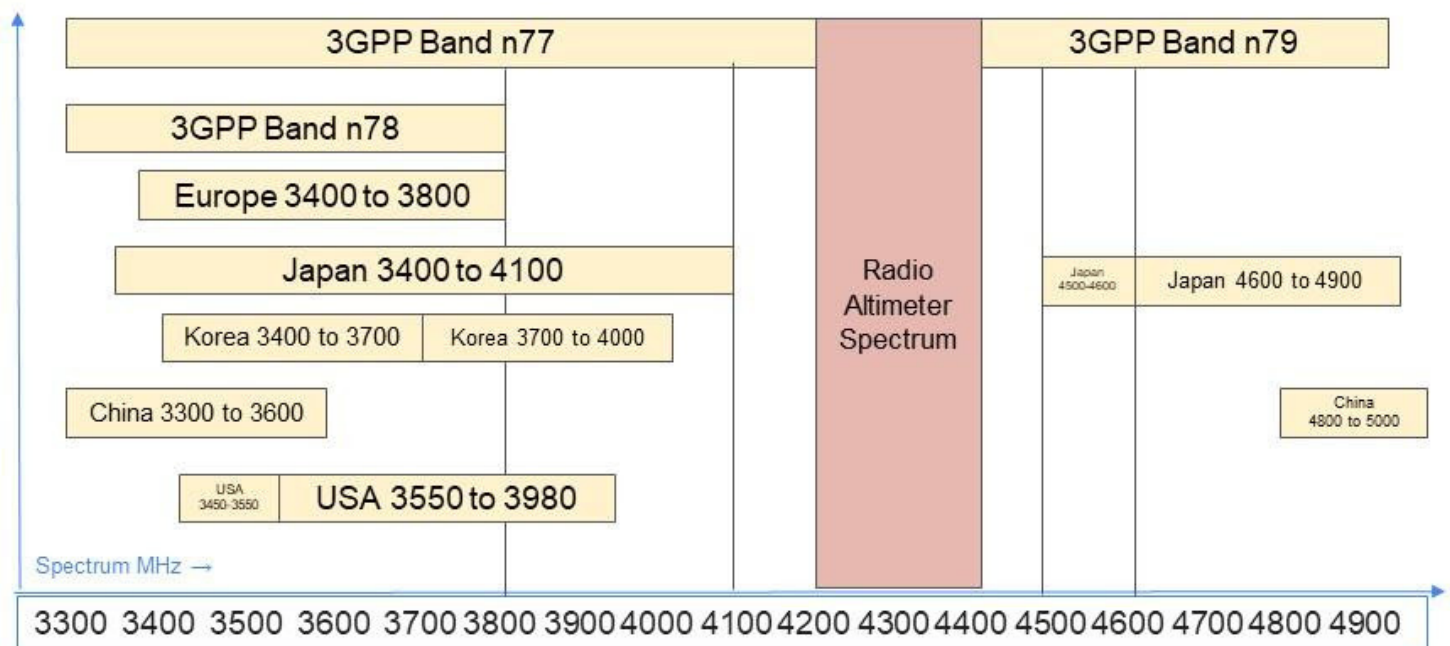
## What is 5G C Band?

C Band is a spectrum that the 3GPP has approved for 5G use around the world. Each country will allocate the spectrum the way they think it should be. 5G is a priority in the USA because broadband is considered a utility. To get it to more people cost-effectively wireless is being used. With C Band, the carriers can deploy more broadband than ever before. C band is being used for 5G in South Korea, Japan, China, across Europe, and in the USA.

Below is the spectrum chart to understand who is using what:

### C Band and RALT Spectrum

An original band model was in 5G America's paper, "*Mid-Band Spectrum and the CoExistence with Radio Altimeters*".



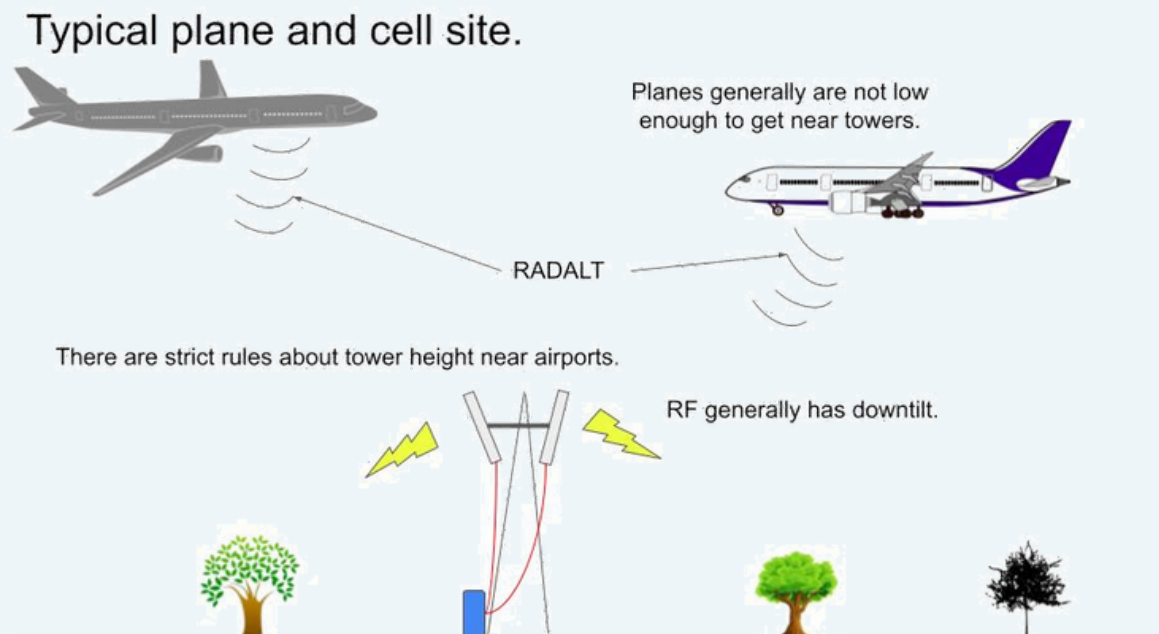
### What is the Problem?

Simply the main concern is about how close the C Band Spectrum is to the Radio Altimeter Spectrum. C Band 5 G in the USA transmits at a higher power than the rest of the world. There are over 200 MHz of guard band between the Carrier's C band spectrum and the Radio Altimeter spectrum.

## There are two main concerns from the Aviation Authorities:

**First Concern:** The Radio Altimeter inside the plane typically has a low noise floor, due to the near C Band Spectrum, the noise floor could rise up and cause RALT to fail. If it cannot hear the beacon, then it could cause the RALT to fail. This is the higher probability to happen

**Second Concern:** It is the Interference. It is less likely but could be an issue. There is a type of interference called intermodulation, this happens when two or more bands could mix and cause a spur, an erroneous signal that could fall in the RALT spectrum. The telecom OEM are very careful to put filters on their radios to make sure this doesn't happen.



## Conclusion

There is a lot of debate among FCC, FAA, Wireless Testing Groups, Carriers, and Airplanes Companies. Carriers invested Billions to build thousands of cell sites. Until this is cleared, there is an important fact that many people didn't realize which is the problem is not with the 5G at large however it is specifically with the C Band in 5G.

*Visit our website*