

Flying with gadgets

The dos and don'ts of using mobile phones and electronic devices on board aircraft

Background

With smart phones, e-readers, MP3 players and tablets now a standard feature of most airline passengers' walk-on baggage, it is vital that the aviation industry identifies any potential safety risks posed by these devices and communicates clear advice on how to use them safely to the public. Passengers naturally expect to use their electronic gadgets on a flight in the same way they use them on journeys by train or bus. However, modern passenger aircraft are heavily reliant on electronic communication and navigation systems which work on the basis of electromagnetic energy transfer and thus they can be susceptible to electromagnetic interference. The degree of risk posed by electronic devices may vary between aircraft types however, making blanket approvals for certain devices difficult. Following recent research in the United States and Europe aviation regulators have now developed new methodologies for examining the potential

risks associated with electronic devices. Consequently, airlines can now seek approval from national regulators to allow their passengers to use electronic devices in Flight Mode during the entire flight and an increasing amount of airlines have already gained approval.

Regulations

The legislation affecting the use of electronic gadgets on board aircraft, which applies to all European airlines, specifically states that:

An operator shall not permit any person to use, and shall take all reasonable measures to ensure that no person does use, on board an aeroplane a Portable Electronic Device that can adversely affect the performance of the aeroplane's systems and equipment.

Each EU Member State, however, oversees this rule in relation to its national airlines. The UK Civil Aviation Authority is therefore responsible for ensuring UK airlines comply.

Mobile phones

The use of mobile phones onboard aircraft to make voice calls or send texts is prohibited on UK airlines, unless the aircraft has been especially equipped with an approved mobile phone control system. If the aircraft has indeed been adapted to allow voice calls and/or texting, the aircraft crew will make that clear to passengers including when this is permitted. Passengers should always assume that they cannot make voice calls or send texts on board their aircraft at any stage of their flight, unless informed otherwise.

The primary rule is that phones should be switched off for taxi, take-off, and landing. During the cruise phase of flight most airlines will allow smart phones to be used in 'Flight Mode' or 'Airplane Mode' for non voice/text/ browsing functions. The aircraft crew should advise passengers when they can and cannot use mobile phones and other electronic devices.

Whilst the aircraft is taxiing, with the cabin doors closed and engines running, there is still a potential risk of mobile phone signals interfering with some aircraft systems and ground communication between flight crew and air traffic controllers. However, although the general rule remains unchanged - phones should remain switched off until inside the terminal building - some airlines have been able to demonstrate that there is negligible risk of interference on board their aircraft, so on a trial basis, passengers are able to make voice calls and send text messages while the aircraft is taxiing to the terminal. The number of airlines permitting this is still very small, so passengers should assume these 'taxi-in' calls are not allowed unless told otherwise by the aircraft crew.

Electronic devices

Airline passengers regularly carry a wide range of gadgets as hand baggage, including laptop computers, tablets/iPads, MP3 players/iPods, e-readers/Kindles and all types of gaming devices. These devices vary in terms of the strength of the electromagnetic (EM) signals they



emit, and they are therefore grouped as those that intentionally transmit a signal and those that do not.

Those that do intentionally transmit, such as laptops and tablets are subject to the same basic rules applied for mobile phones, with most airlines allowing their use in the cruise phase of flight once Flight Mode has been enabled, which turns off all wireless transmitter functions. However, some airlines operate aircraft that have been adapted to enable wireless communication to transmitting devices. In such cases, the aircraft crew will make that fact clear. Passengers should assume that they cannot use any wireless connectivity of an electronic device unless informed otherwise.

All devices, such as MP3 players and e-readers, emit low levels of electromagnetic energy which have potential to interfere with aircraft systems. However, the results of detailed research led by the Federal Aviation Administration of the United States created a methodology for US airlines to use to demonstrate their aircraft's tolerance to such electronic devices during all phases of flight. The European Aviation Safety Agency published similar guidance for European airlines in November 2013 and as a result, a UK airline can now request approval from the CAA for their passengers to be allowed to use electronic devices in Flight Mode for the entire duration of the flight. The airline has to prove they have carried out the required assessment for all aircraft in their fleet before approval is granted.

Currently only a small number of airlines have such an approval, but more airlines are following the process and can be expected to gain approval soon.

Therefore, the primary rule still applies, the use of electronic devices is not allowed during taxi, take-off and landing, unless the aircraft crew specifically states that this is permitted.

Safety risks

Scientific research has shown that mobile phones can interfere with the normal operation of aircraft equipment and can also cause interference in pilot's headsets.

Mobile phones, and many electronic gadgets, when not in Flight Mode, will continue to transmit electromagnetic signals as the device attempts to maintain contact with a communications network. These signals will normally, as in the case of mobile phone networks, be commanded to transmit at the devices' maximum power to maintain the connection between the device and network if the aircraft is in flight and thus at a significant distance from the network's primary field of coverage, i.e. the ground.

The cumulative effect of a large number of mobile phones or transmitting electronic devices being used simultaneously when not in Flight Mode, particularly during the critical phases of flight, such as take-off and landing, remains a serious concern.

Some non-transmitting devices will remain operational, such as watches, medical implant stimulators, hearing aids, etc, but all of these devices are understood to present extremely low emissions and the cumulative effect of them is considered low, and these are not a significant contributor to the overall EM noise that poses the risk to the aircraft receivers, so their use will continue to be accepted during all flight phases. A means by which an airline can expand such accepted use to include other devices is now available and being investigated by some UK airlines.

Future

The proliferation of devices technologies is a recognised issue within the aviation industry. In Europe and the United States guidance material has been developed to allow aircraft operators to characterise the device risks and assess them against aircraft equipment performance in order to prove whether the devices are safe to use on their aircraft. Further guidance has been developed to enable aircraft manufacturers to design aircraft that are tolerant to device electromagnetic energy that is radiated inside the fuselage, often at very short distances to aircraft equipment.

An increasing number of modern aircraft are now equipped with systems intended to enable wireless connectivity for transmitting devices, either with WiFi networks, or with dedicated picocells for controlled mobile phone use. The testing and analysis associated with the acceptance of these systems, demonstrates the aircraft's compatibility with the transmitting devices and enables an identification of areas of aircraft susceptibility that are then addressed, possibly requiring further modification to the affected aircraft, before acceptance is granted. Such acceptance, when granted would be for transmitting device use during the cruise phase of flight. Whilst the number of aircraft that offer this service continues to increase, the full restrictions remain in place on those aircraft for which safe use has not been demonstrated.

Passengers should always assume that they cannot make voice calls or send texts, or use any other wireless communication on board their aircraft at any stage of their flight, unless informed otherwise.