

# Many fliers refuse to turn off electronic gadgets

December 23 2011, By Gary Stoller

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Gadget-dependent fliers are turning a deaf ear to flight attendants' instructions to turn off their devices during takeoff and landing, despite decades of government warnings, a USA TODAY investigation shows.

The investigation, which reviewed thousands of pages of technical documents and surveyed hundreds of frequent fliers, also confirms that the worry about electronics on planes is not baseless: The devices emit [radio signals](#) that can interfere with cockpit instruments and [flight systems](#).

"We really need to get the technical findings out to the public and tell them it's dangerous to use their portable electronic devices in-flight," says Bill Strauss, an electrical engineer whose doctoral thesis at Carnegie Mellon University studied use of electronic devices in-flight.

Documents reviewed by USA TODAY include: more than 25 papers by electronics experts; presentations, papers and advisories by government aviation officials in the USA, Canada, the United Kingdom and Europe; congressional testimony; and Boeing research and information for airlines. The investigation also included: a review of government accident reports and airline pilots' incident reports; a survey of more than 900 frequent fliers; and interviews with Boeing, NASA and independent electromagnetic interference (EMI) experts, flight attendants and pilots unions, and college electrical engineering professors.

Fortunately for air travelers, the probability of EMI is small, the technical papers say.

EMI has not been cited as the cause of any fatal U.S. airline accident, but pilots have reported incidents in which they suspected EMI caused cockpit instruments to go haywire.

Some electronics experts - including Douglas Hughes, an electrical engineer who worked for McDonnell Douglas and the Department of Defense- suspect it might have caused military aircraft accidents and been an undetected factor in some airline crashes.

Government accident investigators in New Zealand said a pilot used a cellphone in the cockpit before he and seven passengers were killed on a charter flight in 2003.

The New Zealand Transport Accident Investigation Commission said the accident was probably caused by the pilot becoming distracted from monitoring altitude during landing. They noted in the accident report that cellphone use can cause "random interference to the proper functioning of aircraft avionics such as navigation equipment and autopilots."

Two recent events have caused frequent fliers to question why they're required to shut off their devices in flight.

On Dec. 6, actor Alec Baldwin was removed from an American Airlines plane for playing a game on his cellphone after a flight attendant told him to turn it off. On Dec. 1, the FAA gave approval to American's pilots - after months of tests - to use electronic tablets in cockpits.

American's pilots can use their own iPads any time during a flight to access aircraft and flight crew operating manuals and navigational charts, says the airline's spokeswoman, Andrea Huguely. The device's Wi-Fi

must be turned off.

Pilots' iPad use "involves a significantly different scenario for potential interference than unlimited passenger use, which could involve dozens or even hundreds of devices at the same time," the FAA says.

## **Why fliers really do need to turn off electronic devices**

"What part of 'please turn your cellphone off' do you feel does not apply to you?" Peter Juhren asked a fellow passenger as their New York-bound Delta Air Lines flight taxied for takeoff Dec. 7 at Tampa's airport.

Juhren, a frequent business traveler from Salem, Ore., says the woman on the phone gave "a disgruntled look" but stopped talking and turned it off - after three times ignoring a flight attendant's request to do so.

Passengers have blamed airlines and the government for safety problems for decades, but now they might have to share some blame.

A USA TODAY investigation shows that passengers are frequently disregarding flight attendants' instructions to turn off portable electronic devices during takeoff and landing - two critical flight phases when a mistake by a pilot could lead to an accident.

Many passengers question the rationale behind shutting off electronic devices in-flight, but the investigation's review of thousands of pages of technical documents shows the gadgets emit radio signals that can interfere with cockpit instruments and electronic equipment and systems on an aircraft.

"Any device with a battery - including cellphones, e-readers, laptops, PDAs (personal digital assistants) and Game Boys - has some level of emission that has the potential to interfere with cockpit instruments or

navigational equipment," says Boeing engineer Dave Carson.

Technical committees have evaluated many portable electronic devices and found the margin of safety is not sufficient to allow passengers to use them during takeoff and landing, says Carson, co-chairman of an RTCA committee that studied portable electronic devices on aircraft.

RTCA is a non-profit corporation that develops communications and navigation recommendations for the Federal Aviation Administration.

Carson says most devices used "in aggregate or independently" by passengers would not meet the RTCA's DO-160 standard, which sets emission standards for airborne equipment.

Electronics experts say they do not have such electromagnetic interference (EMI) concerns about an increasing number of Wi-Fi and entertainment systems installed by aircraft manufacturers and airlines, because those systems are thoroughly tested to meet standards.

EMI-related documents reviewed by USA TODAY include more than 25 papers by electronics experts; presentations, papers and advisories by government aviation officials in the USA, Canada, the United Kingdom and Europe; congressional testimony; and Boeing research and information for airlines.

Some findings:

-A 2008 RTCA study, considered the most recent definitive one on the subject, confirmed that spurious emissions from transmitting portable electronic devices onboard aircraft "could exceed interference thresholds for critical aircraft systems."

RTCA, which gave USA TODAY permission to access the study, says

an aircraft's localizer and glide-slope systems - two systems used for landing - "show potential susceptibility to continuous wave interference," supporting the "prohibition on the use of portable electronic devices below 10,000 feet."

The operation of portable electronic devices "changes the electromagnetic environment" of aircraft radio receivers and "may introduce additional interference effects."

-A 2006 FAA study of 38 flights operated by two airlines observed that cellphone calls were made during all flight phases, and other wireless devices were used during landing approach "well after" flight crew instructions to shut them off.

The study said "considerable onboard radio frequency activity" from cellphones was observed, including some that could interfere with aircraft GPS equipment.

-In a March 2001 service letter to airlines, Boeing said it received "various reports of anomalies in airplane communication and navigation systems that operators suspected were caused by interference from passenger carry-on electronic devices."

Boeing said it sometimes acquired the suspected electronic device but couldn't repeat the anomaly in a lab or on an airplane.

USA TODAY's analysis of NASA's Aviation Safety Reporting System, which lets airline employees report incidents confidentially, reveals that pilots and an air traffic controller reported 32 incidents of electronic device interference with aircraft systems from January 2001 through Dec. 2, 2011.

A pilot of a Canadair CRJ-200 regional jet reported compass system

malfunctions after takeoff at an altitude of about 9,000 feet on a flight last May. The pilot says a passenger had an iPhone in standby mode; when the phone was turned off, the compass system operated properly.

A pilot of a Boeing 737 jet noticed that navigational radios were not updating after takeoff from San Francisco airport in August 2007. The radios started to update after a passenger shut off a handheld GPS.

USA TODAY surveyed more than 900 frequent fliers and asked them, among other questions, how often fellow passengers disregard flight announcements to shut off electronic devices.

Nearly half of 133 frequent fliers who responded to the question said they see fellow passengers disregarding the announcements on every flight or nearly every flight. More than three-quarters of respondents said they often, or always, see such disregard.

Frequent fliers report various tactics fellow passengers use to operate their electronic devices after being told to shut them off. Among others, they turn devices over so the screens aren't visible, and they operate the gadgets under blankets or after flight attendants sit down for takeoff or landing.

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