

Switched off

THE GPS system of a light aircraft taxiing for departure in Western Australia in August 2001 failed to lock on to satellites fully. Halfway through the flight, the system turned itself back on and worked normally. On landing, the pilot discovered that a passenger had had a mobile phone on in the first half of the flight in order to check the unit's range.

About a year later, also in WA, the autopilot of a Boeing 737 initiated an uncommanded climb, which was attributed to a passenger's use of a personal computer. Attempts to replicate the occurrence failed, however.

These incidents are among more than 100, reported to the Australian Transport Safety Bureau during the past 10 years thought to be related to interference between portable electronic devices (PEDs) and avionic equipment. Although there were no accidents linked to PEDs in the period, many of the incidents were worrying.

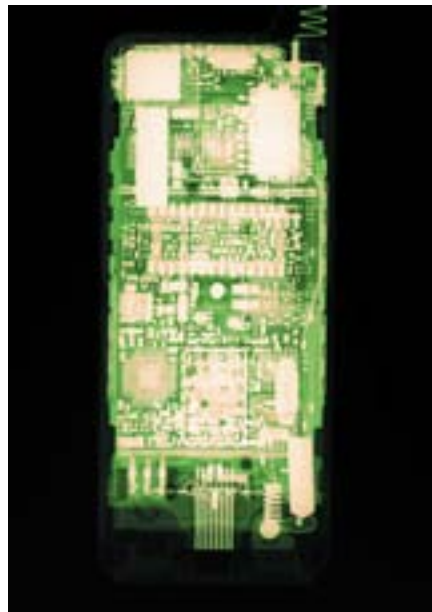
It is often difficult to prove the devices are to blame for sending critical equipment haywire. Attempts at replicating the effect often fail because of difficulties in reproducing the exact electromagnetic environment of the incident. However, evidence of a link is mounting, with the release this year by Britain's Civil Aviation Authority of results of the most definitive study on the subject yet.

Meanwhile, cabin crew are in the front line against inappropriate use of PEDs. And although most passengers are aware of the dangers and follow cabin crew directives to switch the devices off, some are skeptical of the risks and flout the rules.

Mobile phones, laptop computers, radios and some electronic games have been implicated in malfunctions of navigation equipment and autopilot and cabin pressurisation systems.

The CAA study focused on mobiles. Researchers hooked up a VHF communication transmitter, a VOR/ILS (VHF omnidirectional radio/instrument landing system) navigation receiver and a gyro-stabilised remote reading compass system in a screened test chamber, according to the report, *Effects of interference from cellular telephones on aircraft avionic equipment*. They hit the avionic equipment with microwaves of mobile phone frequencies.

The compass froze or overshot the magnetic bearing, indicators were unstable, the digital VOR navigation bearing display had errors of up to five degrees and the VOR to/from indicator reversed. There was reduced sensitivity of the ILS localiser receiver and background noise on the audio outputs.



"Even in standby mode when an actual call is not in progress, a cellphone transmits periodically to register and re-register with the cellular network and to maintain contact with a base station," the report said.

As the aircraft increased its distance from the base station, the output power setting of the cellphone was increased, eventually to its maximum rating, the report added. "The risk of interference is then at its greatest."

CASA has issued a draft advisory circular, available on its website, on proposed new rules governing the carriage of PEDs.

Airlines prohibit the use of mobiles, remote-controlled toys and CB radios at all times during aircraft operation. Some PEDs, including laptop computers, may be used after takeoff, but must be switched off before landing. Hearing aids and pacemakers are not thought to cause interference problems.

Meanwhile, cabin crew sometimes have to draw on all of their diplomacy and assertiveness skills to calm passengers in mobile or laptop withdrawal. It is estimated that PEDs

Research underlines the dangers of using mobile phones and other portable electronic devices in-flight, writes Russell Higgins.

are at the root of 35 per cent of passenger behaviour incidents.

In one case, crew asked a passenger to stop using a mobile phone in-flight. The far out passenger said the device was a "new age" phone, and was not transmitting. The passenger later complied, but, apparently oblivious to bad karma, was disgruntled.

Cabin crew are critical to the investigation of PED-related incidents. Their report to the captain should contain information on:

- model and make of the PED
- identification of PED peripherals
- seat location of the PED
- operating mode of the PED
- name, address, and telephone number of the passenger using the PED
- identification of the aeroplane system affected and description of the anomaly
- frequency and operation mode of the aeroplane system, if applicable
- time between PED shut-off and aeroplane system recovery; and
- flight phase and route.

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