AIRCRAFT LIGHTNING STRIKE

It is estimated that on average, each airplane in the U.S. commercial fleet is struck lightly by lightning more than once each year.

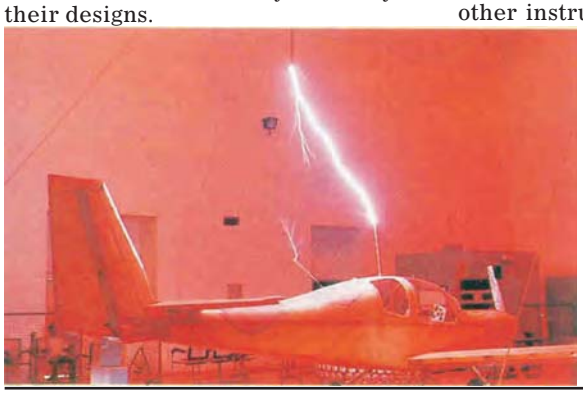
Aircraft often actually trigger the lightning when flying through a heavily charged region of a cloud.

In these instances, the lightning flash originates at the airplane itself and moves away in opposite directions.

Smaller airplanes are thought to be struck less frequently because of their small size and because they normally avoid weather that is conducive to lightning strikes.

The last confirmed commercial plane crash in the U.S. directly attributed to lightning occurred in 1967, when lightning caused a catastrophic fuel tank explosion.

Since then, much has been learned about how lightning can affect airplanes. As a result, protection techniques have improved, and airplanes go through rigorous lightning certification tests to verify the safety of their designs.



Passengers and crew may see a flash and hear a loud noise if lightning strikes their plane, but nothing serious should happen because of the careful lightning protection engineered into the aircraft and its sensitive components.

Initially, the lightning will attach to an extremity such as the nose or wing tip.

The airplane then flies through the lightning flash.

The lightning moves along the fuselage while the airplane is in the electric "circuit" between the cloud regions of opposite polarity.

The current will travel through the exterior skin and structures of the aircraft which act as lightning conductors and exit off some other extremity, such as the tail.

Pilots occasionally report temporary flickering of lights or short-lived interference with instruments.

Most aircraft skins consist primarily of aluminium, which conducts electricity very well. By making sure that no gaps exist in this "conducting" path, the designers can make sure that most of the lightning current will remain on the outside of the aircraft.

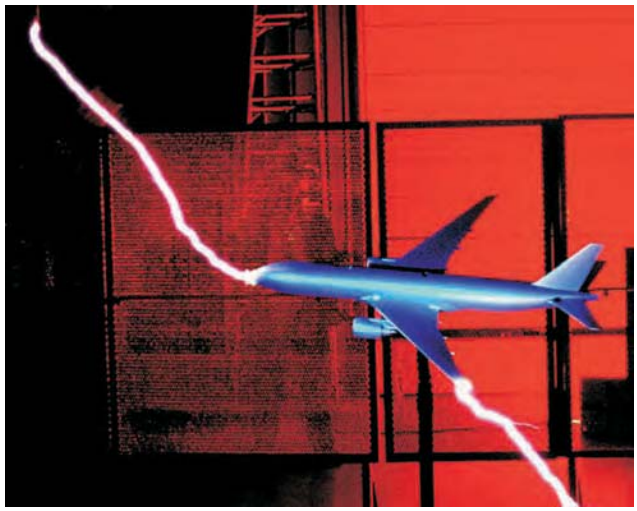
Some modern aircraft are made of a hi-tech mixture of materials, which don't attract electricity as much as aluminium does.

In this case, the outside of the aircraft contains a layer of conducting fibres designed to carry lightning currents away from the aircraft interior.

Modern passenger jets have miles of wires and dozens of computers and other instruments that control everything from the engines to the passengers' headsets.

These computers, like all computers, are sensitive to upset from power surges.

So, in addition to safeguarding the aircraft's exterior, the lightning protection engineers must make sure that no damaging power surges due to lightning can reach the sensitive equipment inside the aircraft.



Lightning traveling on the outside skin of an aircraft has the potential to induce electric current into wires or equipment beneath the skin.

Careful shielding, grounding and the application of surge suppression devices avert problems caused by indirect effects in cables and equipment when necessary.

Every circuit and piece of equipment that is critical or essential to the safe flight and landing of an aircraft must be verified by the manufacturers to be protected against lightning in accordance with regulations set by the Aviation Authority in the aircraft's country of origin.

Engineers take extreme precautions to ensure that lightning currents cannot cause sparks in any portion of an aircraft's fuel system, and the skin around the fuel tanks must be thick enough to withstand lightning burning through.

In addition, new fuels that produce less explosive vapors are now widely used.

The aircraft's nose cone, that contains radar and other flight instruments, is another area to which lightning protection engineers pay special attention.

In order to function, radar has to be able to send out signals. So lightning diverter strips are applied along the outer surface of the nose cone to protect this area.

These strips can consist of solid metal bars or a series of closely spaced buttons of conductive material affixed to a plastic strip that is bonded adhesively to the nose cone. In many ways these diverter strips function like a lightning conductor on a building.

HARRIET, DARWIN'S TORTOISE DIES, AFTER LIVING THROUGH 176 YEARS AND A SEX CHANGE!

Harriet's life began in about 1830, give or take a couple years.

After being "collected" by Darwin on the voyage of the Beagle between 1831 and 1836, Harry as he was then, arrived at Brisbane Botanical Gardens in 1870.

"It's very sad that she died," a zoologist says. "I knew Harriet for over 20 years, and she came to mean a lot to me. She loved people more than any other tortoise I have ever met."

And the Times of London paid this tribute: "Harriet created less trouble in the world than any other living creature, four-legged or biped."