

## Black boxes

### *Prelims: Current events of National and International Importance*

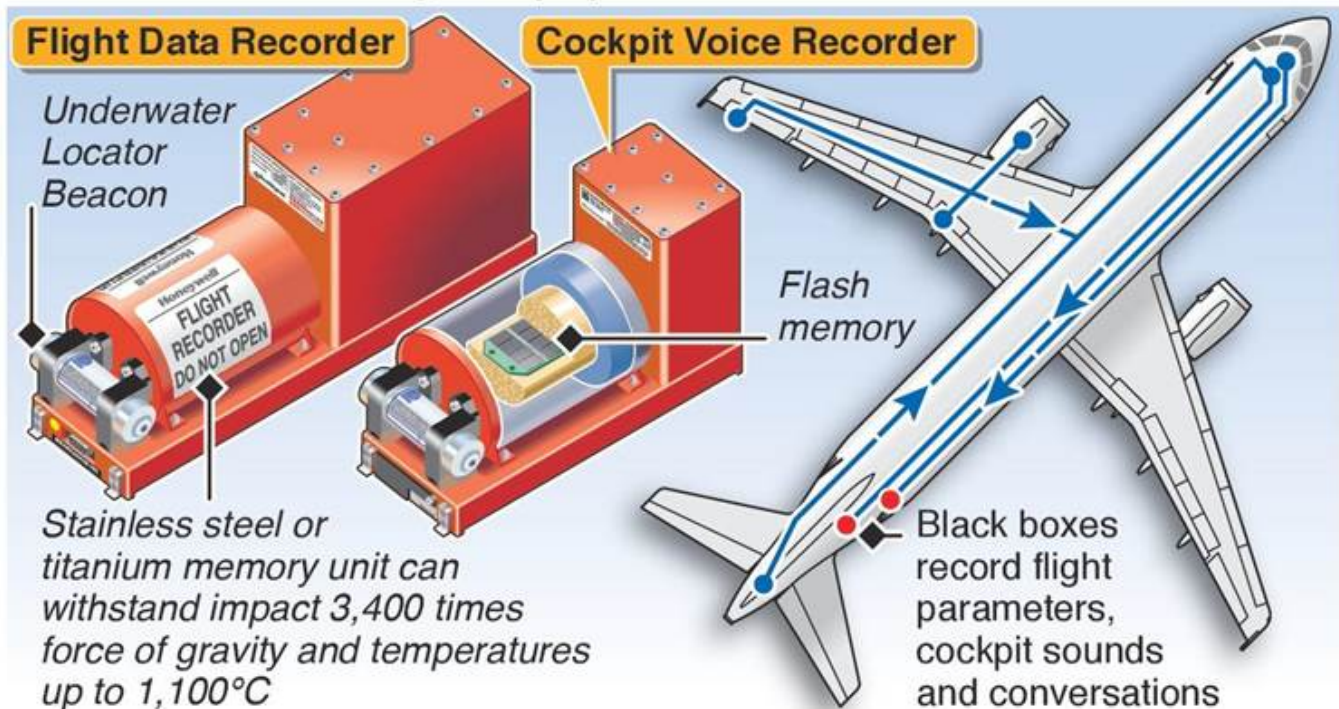
#### **Why in News?**

*After the Air India plane (AI171) crash, the search for the flight's black box continues, which is crucial equipment to find out what happened moments before the disaster.*

- A black box is simply a flight recorder from the early 1950s.
- Black boxes **record data during flights** without interruption and hold crucial information in plane crashes, such as fatal accidents.
- It was launched for commercial operations in 1952, but saw major accidents in its initial years.
- In modern aircraft, there is a Cockpit Voice Recorder (CVR) and a Digital Flight Data Recorder (DFDR).
- Generally, they are called black boxes even though they are painted with bright orange colour to ensure high visibility.
- In some aircraft, the two recorders are integrated.

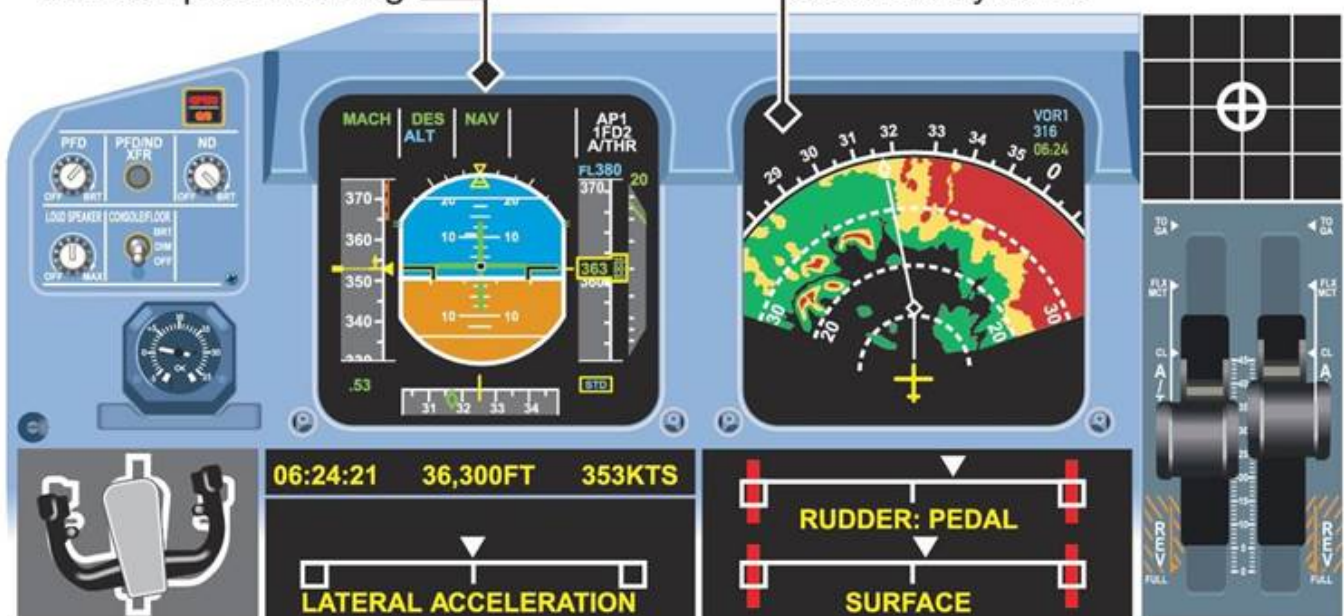
# How black boxes reconstruct a crash

Information from an aircraft's flight data recorder and cockpit voice recorder – the so-called “black boxes” – is used to create an interactive animation of the flight displays in the final moments before a crash



**Primary Flight Display:** Shows “big-five” flight instruments – artificial horizon, airspeed in knots, altimeter in feet above sea level, vertical speed in feet per minute, and compass heading

**Navigation Display:** Weather radar, route plan and aircraft systems data such as fuel, engine power and state of electrical systems



Sources: CAE Flightscape, Honeywell ED-55 Flight Data Recording System

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- DFDRs are **coated with bright orange colour**, treated with reflex material for high visibility, and securely connected with automatically

activated signalisation for localisation underwater, .

- The CVR records radio transmissions and other sounds in the cockpit, such as conversations between the pilots and engine noises.
- The flight data recorder records more than 80 different types of information, such as altitude, airspeed, flight heading, vertical acceleration, pitch, roll, autopilot status, etc.
- The development of flight data recorders evolved over a period of time.
- It started with the use of metal foils for recording data, and later, they were replaced with magnetic tapes.
- At present, **solid-state chips** are used in the flight data recorders.

## Reference

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