

By David. Revised version of my 19th April, 06:34 post

@Curt Bry. Further about this, I agree there is no conclusive theory advanced so far as to how the flaperon and part outer flap separated; and also that cause and consequence are difficult to sort.

However with the flaperon actuators' low resistance to extension flutter might well occur at a lower speed than wing flutter and I note that it appears to flutter during engine ground runs. If so, that could well lead to it separating as the aircraft exceeded the flutter limit, whether or not wing flutter followed. Trailing edge separation might precede that, lowering flutter susceptibility of the remainder, though its very low hinge points and ensuing rotation aft of the lift/drag resultant vector most probably would lead to pitch up and separation of that anyway. I can forward a diagram illustrating this.

As for in-flight separation of the part-outer-flap's trailing edge, the only reasons I can think of that caused that slamming of the support track rear inside it or, more likely, it broke off when the outer flap broke.

As to whether the wing did flutter, evident in 'outside the envelope' dives of a (Silk Air) 737 or (Chinese Airlines) 747, parts of empennage control surfaces detached in flutter without wing flutter, yet MH370's beached wreckage does not include any identifiable parts of these.

More generally though, about the cause of separation of the flaperon and the adjacent part outer flap, I put a case as per the first URL below (warning, a laborious read) that the damage evident to both flaperon and flap, including a bend and twist in the inboard pivot link connected to the flap's rear, suggested the right wing broke in overload, the outer flap being broken at that point.

This was either in flight, most likely in a high speed phugoid if unpiloted, or on the aircraft hitting the seas right wing down, piloted or not.

On that, the configuration I envisage is flaps-housed, based principally on the part-flap's internal damage, obviously caused when the support track was fully inserted or essentially so. In my view (see later) a preceding collapse of the flap to housed, explaining that full insertion, could be ruled out.

Assuming that to be so, since it is unlikely that a pilot would elect to ditch with no engines and flaps up, the above wing break theory would be relevant only to the unpiloted.

Furthermore, such a piloted ditching of the (Ethiopian Airlines) 767 in the Comoros Islands, did not lead to visible damage to its fin, whereas a recovered piece of the MH370 fin's skin indicated serious damage to that, making it more likely that its final crash was at high speed.

Also about MH370 flap deployment, parts of both its outer flaps and the right aileron were recovered as were flaperon closing panels from both sides and of course the right flaperon. Yet there were no identifiable parts of the inboard flaps, though these might have been expected had they been down for a ditching, particularly given their size and being four in number.

All in all then it seems more probable than not that they were not deployed, or, for that matter, vulnerable to that which forced separation of other trailing edge components.

On your point about the limited damage to the flaperon and outer part flap leading edges, surprisingly the outboard end of MH17's left outer flap was ejected with no leading edge damage being apparent, despite that section of the aircraft crashing onto solid ground. The second URL, once expanded, depicts that.

(Even so the crushing of the flaperon's outboard leading edge is unexplained. There was nothing in front of it for it to hit in that way. Perhaps that was after separation.)

Also, please note that the outer support track's carriage assembly has remained in place, affixed to the outer flap part's rib even though broken in support track extraction. The similar MH370 carriage was torn out. So with that in mind, it seems more likely that this did not occur from track extraction but rather it happened during track flailing fully inserted, the carrier being a fulcrum for that flailing initially but then was overloaded. I mention this because the flailing and failure sequence of it and, probably, the track's bottom link to the rear spar, are difficult to discern.....

Finally, in supporting the theory that the flailing would have been with the flap not having been deployed previously, part of my reasoning has been that the flap brake, together with the actuating screw resistance to uncommanded reversal due to the pitch of its thread, would prevent flap actuating mechanism compression under flap loading. Do you agree?

From the above I conclude that most likely:

- The flaps were not deployed and that, if piloted, he dived the aircraft into the sea.
- If piloted or unpiloted, the flaperon could have separated in flutter, conceivably causing flap separation.
- More likely the right wing broke on impact, unpiloted, separating both or,
- in fact that happened in the air in a deep high speed phugoid.

Please let me know should there be any hyperlinks in the below that you would like to see but are inaccessible:

<https://docs.google.com/document/d/1ClXqhdHZJkrp4MkTkx6fFzq0D7w5pxf2/edit?usp=sharing&oid=105452605762640315384&rtpof=true&sd=true>

https://docs.google.com/document/d/1ShIUUak42kyU9UaCl2PWc_Ch8TCEjx0U/edit?usp=sharing&oid=105452605762640315384&rtpof=true&sd=true