

WHY ALL THE FUSS ABOUT LEVEL BUSTS?

by
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It should not have escaped your attention, especially if you have been reading any UK CAA/Industry Flight Safety publications recently that there is a lot of attention being paid to the subject of Level Busts. A 'Level Bust' awareness campaign, spearheaded by the CAA, is underway and gathering momentum with an increasing amount of industry publicity being given to the topic together with encouragement for Aircrew and ATC to report these type of incidents. Despite this campaign there are, I suspect, many sceptics, especially on the flight deck, who consider they have never been involved in a level bust, or that if they have and no conflict resulted, then there was no danger. Such people may be wondering, 'why all this fuss?'

It is my aim, by the end of this short article, to convince any sceptics of why level busts are a serious flight safety issue and are of concern to all pilots and controllers.

In 1993, it became noticeable that reported incidents of aircraft in UK airspace, deviating significantly (more than 300 feet) from their vertical clearances was increasing. This increase had become a significant safety issue because it was causing a rise in the recorded rates of loss of ATC standard separation. Early studies into the problem, as it affected UK airspace, lead to the publication of two CAA "Data Plus" safety leaflets regarding level busts ,in 1994 and 1996, and NATS held a series of workshops and presentations with airlines because it was recognised that this was a serious safety problem. A third Data Plus leaflet has just been published highlighting level busts recorded in UK airspace since 1994. The most noticeable change over this three years is the sharp increase from 1996 to 1997 in the number of incidents involving loss of ATC separation. Clearly the level bust problem is not going to reduce by itself.

On 12 November 1996 there were two particularly significant level busts; one occurred in Indian airspace near Delhi and the other a few hours later in the Lambourne Holding Pattern in the London TMA. The major difference between the two occurrences was that the level bust near Delhi resulted in a tragic mid-air collision whilst in the one over Lambourne, good fortune meant the only injury was to the pride of a B737 crew and considerable anxiety for the controllers who had to resolve the situation. Industry safety publicity about the Delhi accident is scarce (to date no formal accident report has been published by the Indian authorities). (*Ed note: The report has now been published*) Whilst it seems that little has been learned from the Indian accident to prevent a recurrence elsewhere, the UK CAA has taken the matter seriously. Soon after it was realised that the cause of the Delhi accident was linked to a level bust, the CAA embarked on a more vigorous level bust safety initiative which is still on-going.

Pilots and air traffic controllers are all acutely aware that life in recent years has become busier as civil air transport movements continue to grow year on year and as a consequence airspace is becoming more congested. Whilst ATC systems have steadily improved and many facilities now incorporate safety nets in the form of conflict alert systems, the design and performance of modern aircraft have improved quite dramatically in recent years. Improvements, particularly in aircraft navigation and the advent of the computerised 'glass cockpit' flight management systems now mean that the aircraft are flying with great accuracy. When combined with the advanced auto flight abilities and impressive climb and descent qualities of these aircraft, it means that when positional errors are made by aircrew or controllers, regarding their safe airspace management, any conflict with other traffic in the

same piece of airspace will result in much closer proximity. This can increase significantly the threat of a mid-air collision.

Within the London Terminal Control Area (LTMA), the ATC task is to integrate safely the flight paths of aircraft arriving at and departing from the major London Airports with those of over-flying aircraft and those wishing to join the airways system in the London area. The complex nature of the operation is eased by the use of Standard Terminal Arrival Routes (STARs) and Standard Instrument Departures (SIDs) which specify predetermined tracks and levels to be flown by arriving and departing traffic. Normal ATC co-ordination procedures are augmented by the use of 'Standing Agreements' (SAs). SAs allow aircraft to enter the airspace of an adjacent sector without individual co-ordination of their transfer arrangements as long as certain conditions regarding levels and routings are met. Therefore, STARs, SIDs and SAs are now fundamental to the operation of a busy ATC units since they facilitate the safe and efficient flow of traffic during the departure and arrival phases of flight. Moreover, these procedures are heavily reliant upon accurate and reliable level keeping by the pilots flying their aircraft.

To put this aspect of operations into some sort of perspective; in 1997 the London Area and Terminal Control Centre (LATCC) provided an ATC service to over one and a half million commercial air transport flights and of these nearly one million operated in the London TMA. Considering each of these flights would have made, perhaps, 10 level changes inside this very congested airspace to maintain safe operations, the need for accurate vertical navigation by pilots, and clear, unambiguous communication of level change instructions between aircrew and air traffic controllers becomes self evident.

ATC radar conflict alert systems and the increasing number of commercial aircraft fitted with TCAS have helped to reduce the threat of a level bust resulting in a mid-air collision. The advent of the mandatory carriage of TCAS II for aircraft with 30 seats or more, from 1 January 2000, and improvements in airborne collision avoidance and the ATC conflict alert systems should help to further reduce the risk in UK airspace. However effective, such safety nets cannot be relied upon in isolation.

Level busts are an ever-present safety menace in today's increasingly crowded and complex airspace environment. Both pilots and controllers must be fastidious in checking and monitoring all vertical clearances, pilots must be constantly aware of the hazards in deviating from assigned levels and do their utmost to prevent them whilst controllers and pilots must remain vigilant at all times to the mid-air collision threat they pose - which is really what all the fuss is about.

Note; Graeme Stagg is the ATC Flight Safety Analyst in the CAA's Safety Data Department, the JAAP Executive and report book editor. He is also a member of the CAA/Industry Level Bust Working Group (LBWG). However, this article has stemmed from his work in all 3 areas and has been written primarily for the LBWG's current awareness campaign. Nevertheless, the views he has expressed in this article are personal ones and do not necessarily reflect the views of the CAA, the JAAP or the LBWG