

AIR TRANSPORT...



V₁ V₂ AND ALL THAT

Part 16 of C.C.J.'s "V" Classifications

To finish off the landing definitions, there remain only the touchdown speed and the overshoot speeds and the first of these is dealt with in this instalment.

LIKE V_{10t} in the take-off case, the touchdown speed, V_{td} , is not one over which the pilot has precise control; after passing the threshold at or near V_{tt} , the aircraft to a large extent touches down where and when it listeth (and it can list quite a lot when one takes into account that a 1kt variation of V_{tt} is equal to about 100ft of runway). The ICAO PAMC and the BCAR certification techniques do, however, endeavour to ensure that the aircraft has a reasonable flare capability and to this extent V_{td} has some effect on V_{tmax} (and hence on the measured landing distance) in that, as mentioned in Part 14, from a speed of V_{tmax} at the threshold, there must be, for the modern jet transport, somewhere around 6sec before the main wheels touch.

Further protection around the touchdown is provided in the PAMC by enumerating certain representative delays.* Thus, for example, when spoiler or reverse thrust is selected before nosedown, there should be about four seconds from touchdown to nosedown; when, however, this selection cannot be made till after nosedown, then nosedown is taken as two seconds after touchdown; and when successive control actions are involved an interval of one second is allowed between the completion of one action and the initiation of the next. Finally, in the new BCAR specification† (but not elsewhere) additional safeguards are taken to prevent a very fast V_{td} on which possibly the nosewheel hits first; this is ensured by providing

that V_{td} must be at least 5kt lower than the fastest touchdown speed which can safely be demonstrated.

The net effect of all this is to keep the certification technique, type for type, as close as possible to that employed in day-to-day operations—otherwise one could, presumably, obtain the "measured landing distance" by having a team of test pilots in the cockpit more or less simultaneously slamming on reverse thrust, airbrakes, spoilers and wheelbrakes on, or even before, touchdown.

Definition

21.5 The Touchdown Speed (V_{td}) is the speed at which the main wheels of the aircraft touch the runway. In certification procedures, V_{td} is determined on the basis of landing from a threshold speed of V_{tmax} and is associated with certain minimum delays as between touchdown and nosedown and between the successive application of the auxiliary controls (spoilers, airbrakes, reverse thrust, wheelbrakes). V_{td} must occur at least $13-0.045 V_{tmax}$ seconds after passing the threshold.

Note: In British Civil Airworthiness Requirements V_{td} must be at least 5kt less than the fastest safe demonstrated touchdown speed.

PAMC 9.2.1.1 ICAO Doc. 8458-AN/881, page 36.
BCAR D2-5 Sects. 2.10, 8.3.3, 3.9 and 3.10 Draft
BCAR D2-5 Sect. 3.3.1.

*Doc. 8458, 9.2.1.1, page 36.

†Draft BCAR VD 2-5, sect. 3.3.1.

The Douglas DC-10 The designation DC-10 has been given to the Douglas "C-5A technology" subsonic civil transport project. Boeing has a similar C-5A project which is designated the 747 (see pages 8-9).

Fourth 320C for Flying Tiger The lease of a fourth Boeing 707-320C has been arranged by Flying Tiger Line for delivery in December. The two 320Cs which have been bought by FTL were delivered in 1965 and a third (leased) aircraft is to be delivered in June.

Manhattan-JFK Helicopter Service After five years of effort a helicopter service between the roof of the Pan American building in Manhattan, New York, and John F. Kennedy International Airport began on December 21. The flights, in New York Airways' 25-passenger Boeing Vertol 107 helicopters, take about seven minutes, reducing the time between terminal and boarding from 1½-2 hours to 45 minutes. The cost is \$7 (£2 10s) for the single journey. A total of 17 round trips are planned each day to coincide with peak Kennedy arrival and departure periods.

The operation of New York Airways Vertol 107 services to and from the Pan American building rooftop heliport in New York started on December 21. In this "fish-eye" photograph the tops of the Empire State Building (centre) and the Chrysler building (left) can be seen above the lip of the platform (see story above)

