

# What About Airbus Automation?

The A330 uses a fly-by-wire system—the sidesticks are not physically connected to the flight controls. Instead, they are electronically linked to a computer, which determines the pilot's intent and sends an appropriate signal to hydraulic mechanisms to move the control surfaces. The aircraft has three flight control primary computers and two flight control secondary ones; they do the calculations necessary to deflect the flight controls. Refer to the schematic at right.

The logic governing the computers is called control laws. In nominal operation, the A330 is in normal law. When monitoring triggers a fault, it may be replaced by degraded laws—alternate 1 or 2—or by direct law.

Normal law offers complete protection of the flight envelope: pitch and bank values are limited, based on expected load factor. In alternate law, fewer protections exist. In direct law, the sidesticks control the position of the various control surfaces directly. In alternate or direct law, angle-of-attack protections are no longer available.

The airspeed presented to the crew is the median value. When speeds from one of the three pitot tubes deviates too much from the other two, it is automatically rejected and the one presented is the average of the two remaining values. If the difference between these two remaining values becomes too great, they both are rejected and the control law changes to alternate 2. This is the control law in effect aboard AFR447 beginning at 0210:05 UTC and continuing to the end of the flight data recording.

