FROM THE COCKPIT
Sidney Dekker

All Change

While in his thirties, **Sidney Dekker**, a professor of human factors and safety, decided he wanted to fly airliners as a side job. He describes going from the top of his university hierarchy to the bottom of the pilot pecking order.

I was promoted to professor at the age of 34. It was a bit scary because what would I do now? More of the same for another 34 years until retirement? I knew I didn't have the temperament to be a university administrator. With a background in psychology and engineering, my area of expertise was (and still is) human factors and safety. I'd been flying gliders and general aviation aircraft since the age of 14. My logbook contained about a thousand hours of glider towing, flying parachutists, as well as instruction, spread across the Netherlands, UK, Sweden, the US and Australia. I'd also obtained instrument and multi-engine ratings. Then a good friend, himself a pilot on the Fokker 50, told me that he'd been talking with a Boeing 737 operator, Sterling (later Cimber Sterling), which apparently might be interested in helping me get a type rating so I could fly for them. It was one of the most exciting offers of my life.

Cimber Stirling Boeing 737-73S, OY-MRU (c/n 29079), 'cleans-up' its undercarriage as it departs a wintry Salzburg, Austria on a return rotation to Copenhagen. AIRTEAMIMAGES.COM/ DANIJEL JOVANOVIC

So in early 2007, I drove to Copenhagen airport to start my training. First I had to do a multi-crew conversion (MCC) course and this consisted of theory and simulator sessions. We conducted the sessions on the 737, which gave me an excellent preview of the aeroplane. Type rating training followed soon after. I hung on to my university job, taking time off for type and line training and making allowances for a greater intensity of flying during the first year, so as to build up experience.

Need to Know

The most difficult aspect of the type rating course, for me, was the 'need-to-know' basis on which it was taught and examined. The 737 Next-Generation (NG) has hundreds of thousands of parts, a variety of different systems and lots of computers. It would not be feasible to teach pilots to take the aircraft apart and put it back together again (even in an imagined way). Of course, that is not far from how type ratings on the first jets were conducted, but that was at a time when a regulated industry had the luxury of allowing pilots to spend six months on a type rating course. This course was only a few weeks long and the first two were spent on theory, going through the aircraft's many systems in a combination of classroom teaching, computer-based training and self-study.

The author sitting in the cockpit of a Boeing 737 after completing a smooth landing at Chania, Crete. AUTHOR

I've always had a relentless curiosity for how people and systems work. The point of scientific research is to never be content with an answer; to always generate new, and better questions. »

On final approach to runway 04L at Nice Côte d'Azur Airport on the French Mediterranean coast – a destination favoured by the author. AIRTEAMIMAGES.COM/TT

BOTTOM • ***The Boeing 737NG formed the backbone of Cimber Sterling's fleet until it stopped flying on May 3, 2012.*** AIRTEAMIMAGES.COM/DANISH AVIATION PHOTO

I learned that this is not the mentality to bring to a type rating course. To give you an example, all that the section on hydraulics revealed about the physical layout of the system was a 'hydraulic power distribution schematic'. It was a superficial drawing in the 737 Flight Crew Operations Manual, a neat, rectangular collection of boxes and connections, with the odd pump, reservoir and valve drawn in for good measure. I'd in fact learned more details of the cable release mechanism of the K-8 glider I soloed on when I was 14. Yet as models go, the drawing of the hydraulic system was great: highly abstract, schematic and organised. It was all I needed to know, but how did that model correspond to the engineered reality strung throughout the aircraft? Well, it would be like giving a neurology student three electrodes and saying: here's a model of the human brain.

Later that week, we were taken on a walk-around of the aircraft. Standing on the tarmac and peering into the wheel well, my upper body was swallowed up. On every available surface, of which there are quite a lot, there was a spreading, buzzing, blooming, oily confusion of tubes and lines, of pipes and hoses, ducts and conduits, reservoirs and the occasional gauge. It looked like so many pounds of dry-cooked, hopelessly intertwined spaghetti clinging to the bottom of a pot. I could not fathom how this was actually deliberately designed by engineers.

When I asked the captain about it on the walk-around, he just pointed out two main reservoirs and some pumps. Clearly, all I needed to know was that there was a system A, a system B and a standby system, and some rudimentary (and hugely oversimplified) connections between them and the aircraft's controls. I could recognise precious little of that while standing in the wheel well. I ducked out and continued on the walk-around:

ABOVE LEFT • ***Airport arrivals chart for Nice Côte d'Azur Airport.*** ALL RIGHTS RESERVED BY LUFTHANSA SYSTEMS. THE CHARTS ARE A PART OF THE LIDO/ROUTEMANUAL PRODUCT, AVAILABLE TO THE FLIGHT SIMULATION COMMUNITY VIA NAVIGRAPH CHARTS AT WWW.NAVIGRAPH.COM

Caption

ABOVE AND INSET • ***From a Pilatus B4 aerobatic glider to a Boeing 737 passenger jet in a few weeks: Sidney Dekker sorting through charts before a flight to Amsterdam from Copenhagen.***

as I ever had, nailing the downwind leg at 1,500ft exactly, never overbanking, and touching down gently. And the 737, bless its builders, allowed it all. It was as if I'd upgraded to a slightly bigger version of the parachute club's Cessna 206. The softness and responsiveness of the controls, the sensory feedback of angles, speed, energy – this aircraft enabled me to be the pilot I knew (or hoped) I was. I learned quickly that an increase in engine power leads to a nose-up pitch (because of the underwing engines), and vice versa, but even that slightly adverse design effect was predictable and easily compensated with the yoke and trim.

My first flight with passengers was from Copenhagen to Agadir, Morocco. We took a safety pilot with us, a senior first officer. The poor guy had to sit on the jump seat for over four hours (and then four more hours on return). He didn't manage, because the seat was too hard. The longer we flew, the more he'd disappear, or stand up, or stretch, or generally moan about his fate.

The next flight, the very next day, was to Amsterdam. The idea was that the professor didn't need a safety pilot anymore, and so I flew with just the airline's technical pilot (also a training captain). Amsterdam is a bit busier than Agadir, but it was a delight to land at the very airport near where I grew up, and speak a few words of Dutch with ATC. Not long after that, I flew to Berlin/Tegel from Copenhagen. But that wasn't a proper flight, it was so short it was more like a ballistic trajectory. Slipping over the runway threshold, I genuinely wondered how it happened that we were even correctly configured for landing. I felt like I was sitting on the tailplane, a distant observer way behind the curve.

"Slipping over the runway threshold, I genuinely wondered how it happened that we were even correctly configured for landing."

Hand Flying

My love for flying the 737 was unleashed for real on a flight to Nice, early on during line training. When you fly to Nice from the north, you have to clear the Alps, and then descend over the Mediterranean Sea. Sometimes it takes a while for ATC to clear you back to the field, and you get the sense of flying all the way to Libya before being allowed to return to France. On that first approach, to Runway 04L, I still had the 737 on autopilot while motoring towards a VOR on the beach. "What happens next?" I asked. "Well," said the captain, "nothing happens unless you switch it off and hand-fly her from here on." So I did.

The landing was so smooth that the only noticeable thing was the speed brake handle coming back on the centre console. I recognise Boeing likes »

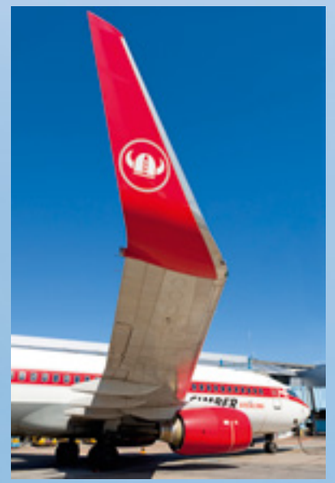
The approach into Madeira Airport is one of the most challenging in Europe. AIRTEAMIMAGES.COM/OLIVIER CORNELOUP

its pilots to land more firmly than that, because they want to make sure that the aeroplane 'knows' it has landed as well. But the passengers loved it and I got lots of compliments during disembarkation. Given that a pilot is only as good as his/her last landing, I felt pretty good that day.

As my confidence and enjoyment grew, I started hand-flying more complex approaches, and from higher up, sometimes clicking off the autopilot and auto-throttle at 15,000ft. Of course, I always asked if it was OK with the captain, as it creates more workload for the monitoring pilot. Without exception, they encouraged me to do it. I loved flying for an airline like that. I know that for the operator and the manufacturer, the heart of a 737 cockpit is the flight management system. For me, the heart of that cockpit was the yoke and the throttles.

My previous professional deformation never left me, however. On various occasions, training captains would tell me: "Stop thinking, Dekker. Start doing." My feeble response was that I got paid to think in my other job. I realised that this was very different. Once, during pushback and start-up, I reached up to the ignition switches and got my hand violently beaten back by the captain. I'd reached up too early: the engine bleeds were still on for air conditioning. It was my job to turn those off. I didn't take it personally. There was little time and lots of other work in that short moment right after pushback.

One occasion, however, my earlier professional life came in quite handy.



One of the carrier's Boeing 737s in the maintenance hangar at Copenhagen proudly displaying Cimber Sterling's new livery after the rebirth of the airline in December 2008.

This Boeing 737-7L9, OY-MRE (c/n 28008), was originally delivered to Sterling Airlines, but was transferred to Cimber Sterling in March 2009 after the formation of the new airline. AIRTEAMIMAGES.COM/EUROPIX

A lady passenger was suffering badly from fear of flying and the cabin crew didn't know what to do. With a background in psychology, I was asked if I could help. The captain agreed. The lady and I had a pleasant chat and I was able to assuage her concerns about the aircraft, its behaviour and noises. Towards the end, I asked if there was anything else I could do. "Yes," she answered, "please go back to the front and resume your work there." I was humbled.

The beauty of expertise

I have always loved seeing experts at work: the ease with which they apply their skills, the smoothness of their movements, the tacit knowledge they so easily draw upon. What never failed to impress me about a 737-only operation was the amount of deep expertise available. There were 30-year veteran pilots who knew every single nut and bolt on the airframe. Others had somehow specialised in a particular aspect of the aircraft: its avionics, or the best way to land it in a crosswind. With only six examples in the Cimber Sterling fleet [created on January 7, 2009 after Cimber Air acquired parts of bankrupt Sterling Airlines] it wasn't qualitatively different from what you find at a flying club: it contained big toys and boys (mostly boys), who were known variously for their prowess in de-icing fluids, their intimate knowledge about the finer details of lateral navigation (LNAV) approaches, or what exactly to use to wipe the bugs off the windscreen at the end of a day. The love for flying, the dedication to equipment and colleagues, the informal knowledge of whom to go to for what, the boyish zest for the whole activity: it was all there. I recall departing from Copenhagen with the chief pilot, who was flying. After rotation and calling for gear-up, he nursed the yoke with his hands and shrieked: "I love this, I love this!" Perhaps he'd just had a whole bunch of boring meetings – chief pilots do – or perhaps he really was in love with flying... or both. I tried to imagine a tax accountant shrieking the same thing when »

Cimber Sterling's Next-Generation Boeing 737s were fitted with fuel-saving Aviation Partners Boeing winglets. AIRTEAMIMAGES.COM/EUROPIX

touching the first file of the day.

I did see another side to all this, however. The word pilots use for being at a single-type airline is 'homesteading'. First, it is known to be associated with its own risks – indeed the other side of expertise. Once you have accomplished your type rating as a homesteader, there is no further lengthy encounter with the technology and systems of the aircraft, other than the recurrent proficiency check, but that only covers a sliver. How can you be sure that your knowledge, particularly in unusual situations, is still detailed enough, that it is well calibrated and quickly accessible – not stunted and numbed by the years-long repetition of uneventful operations?

Second, you could argue that there is something slightly tragic about homesteading. Imagine upgrading to 737 captain in your thirties, and realising that the very same left seat will be your working station for the remainder of your career. There may be no possibility of any other equipment to fly, as the airline is unlikely to ever buy it. Seniority lists still create something of a golden cage for airline pilots: often you can only escape to another carrier by downgrading, by relinquishing seniority, or by starting at the bottom altogether. Of course, some might find the predictability of role, routes and equipment reassuring, while getting endorsements for trickier approaches, such as Innsbruck or Madeira, can add spice.

And yet, with all of that expertise, even an airframe as tried and tested as the 737 contained, in the words of our technical pilot, "booby traps". Think of the insidious radar altimeter/auto-throttle connection that was brought to the fore in the February 2009 Turkish Airlines Flight 1951 accident at Amsterdam. It is interesting to note that 737 pilots the world over did not know the auto-throttle always gets its height information from the Captain's radar altimeter, even when the co-pilot is flying and has all the autopilot systems switched over to his/her side. This fact is not disclosed in the 737 Flight Crew Operations or Training Manuals, and there is no indication of it in the cockpit.

The Dutch Transportation Safety Board asked me to conduct the human factors part of the investigation, which I did. It was a fascinating journey into automation surprises, and humbling too: the behaviour of the auto-throttle was a problem that many other pilots would have also been vulnerable to.

In testament to how quickly the industry tries to learn, however, the Turkish 1951 scenario was played through the very next proficiency check in the simulator. To me, it was no longer a surprise when the auto-throttle closed and speed started bleeding off. I was able to intervene in time. Having just finished the human factors report into the accident, I agree, that wasn't necessarily impressive, but it was instructive to see it live, and to realise that learning from failure is part and parcel of the way the whole industry is set up.

Of course, you could argue that the best way to prevent recurrence of the accident would be to change the design, rather than teaching pilots to stare harder at their displays and intervene more aggressively at the first sign of trouble. However, with more than 6,000 examples produced, there are evidently limits on what manufacturers and operators are willing to bear.

I flew part-time for about four years before Cimber Sterling went bankrupt. Did it ever get boring? That is like asking whether being a professor ever gets boring. During certain faculty meetings, yes, being a professor gets so boring that I lose the will to live. But put me in a lecture theatre filled to the brim, with an electrified atmosphere, and I'll tell you there is no better job. The same goes for flying a 737. Droning on autopilot above an unrelenting layer of clouds in the evening, with nothing to see or do, when all you wish is for the thing to go faster so you can get home – yes, that gets tedious. But hand-flying a right-hand circuit to Rhodes in still, thick, honey-coloured evening air, making a landing like a sweet kiss, and then turning the plane around in exactly 30 minutes, in a collaborative choreography of walk-around, FMS programming, boarding, load sheet, procedures and checklists, and then taking off in time? I never felt so alive. AW

> "...while getting endorsements for trickier approaches, such as Innsbruck or Madeira, can add spice."

The author describes the handling of the Boeing 737 Next-Generation as simply a bigger version of the parachute club's Cessna 206.
AIRTEAMIMAGES.COM/ MICHAEL PRIESCH

Parked on the apron, this Cimber Sterling Boeing 737-7L9, OY-MRG (c/n 28010), awaits its next load of passengers.
AIRTEAMIMAGES.COM/ EUROPIX

Three of Cimber Sterling's Boeing 737-700s are parked at Copenhagen after the airline filed for bankruptcy on May 3, 2012.
AIRTEAMIMAGES.COM/ EUROPIX

Sidney Dekker has returned to being a full-time professor, after his brief but eventful commercial airline career, although the flying bug hasn't disappeared altogether as he continues to fly his aerobatic glider at weekends. More at sidneydekker.com