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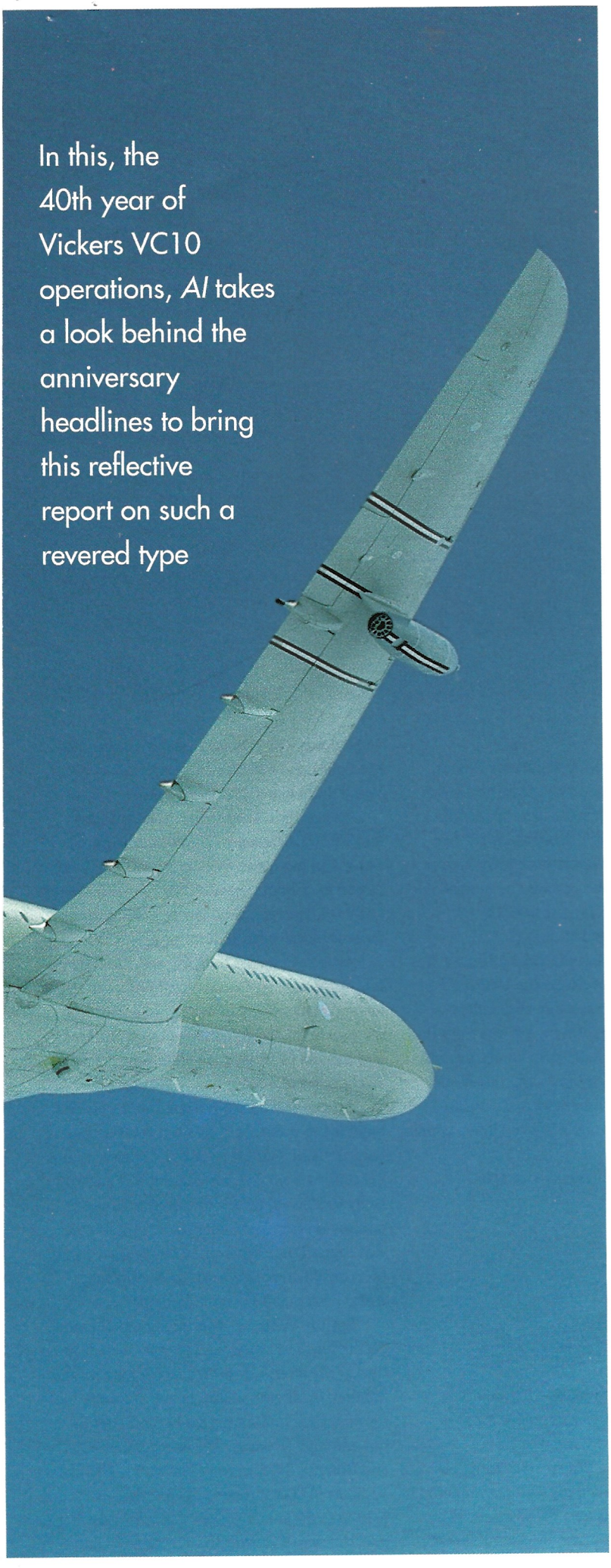
The Vickers VC10... a T-tailed masterpiece of aviation that has been held in the highest esteem for over 40 years, whether soaring the airways in commercial service or filling the thirsty tanks of 21st century combat jets in times of war.

Jeremy Flack/API



In this, the 40th year of Vickers VC10 operations, *AI* takes a look behind the anniversary headlines to bring this reflective report on such a revered type

words: **alan harper**

In the days when air travel was an adventure, when airline food was made of real plastic and in-flight entertainment was a model kit that your dad had brought for you to glue together on the fold-down table of your Comet, BOAC's marketing execs created the Junior Jet Club. You got a metal badge, an extraordinarily impressive certificate for every 25,000 miles flown, and a blue cloth-bound logbook in which the captain would record every detail of your flight.

'Oh God, I remember them,' says Nick von Berg wryly. 'You'd have spent hours flying through the night and you'd just be planning your descent when the purser would bring in this stack of little blue books to fill in. Terrible things!'

East African Airways' special relationship with BOAC meant that colonial children like me could get their logbooks signed by either airline. According to mine, EAA captain Nick von Berg flew me to or from 'home' — for me it was Nairobi, for my parents the UK — on three occasions between 1969 and 1972 in EAA's Super VC10s: once in 5X-UVJ (now ZA149) and twice in 5H-MMT (ZA147).

Now, more than 30 years later, we were both back aboard 'UVJ, flying at 16,000ft over the North Sea. Sqn Ldr Nick Wilcock, the RAF's chief VC10 flying instructor, was in the left-hand seat, with Nick von Berg behind him. There was no sign at all in the cabin of the economy-class seat I had occupied on that London-Nairobi flight, aged 10, but in front of us, filling the windscreen, was the unmistakeable shape of another VC10, its centre hose deployed, the basket dancing in front of our nose refuelling probe. It was 'MMT.

LAST OF THE LINE

The only remaining operators of this most distinguished and elegant of British airliners are Brize Norton's No 10 and No 101 RAF tanker squadrons — and this little escapade was anything but surreal to them.

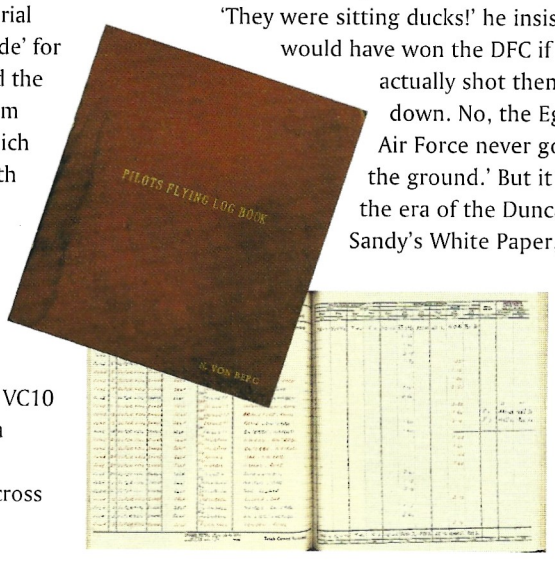
Having launched two of their ex-EAA Super VC10s, designated K3s, it was not long before the pair were tracking a familiar course around a designated Aerial Refuelling Area (ARA). Our 'Trade' for this particular mission included the thirsty tanks of RAF Jaguars from No 6 and No 54 Squadrons, which were replenished over the North Sea, along with a pair of Tornado F3s from No 111 Squadron. A third VC10 in the form of C1K XV107 then entered the fray, and our very own ZA147 ('MMT) then proceeded to refuel both of its VC10 sisters. The unlikely trio, with a combined age of 102, broke company as we high-tailed it across country to the Irish Sea for a rendezvous with prototype Eurofighter ZH588.

'Absolutely amazing,' said Nick von Berg. 'The whole day has been incredible. Although that refuelling was a bit hairy — I haven't flown that close to another aeroplane since my Venom days. I'd have liked to have had a go, though.'

HOT N' HIGH

South African-born Nick joined the RAF in 1953 and by the time of the Suez Crisis was with No 8 Squadron flying ground-attack Venom Mk4s from Khormaksar, Aden. For 2 November 1956, whilst on detachment to Akrotiri, his logbook contains the memorable line: 'Dawn Strike, Kabrit. 1 MiG-15 destroyed, 1 damaged.'

'They were sitting ducks!' he insists. 'I would have won the DFC if I'd actually shot them down. No, the Egyptian Air Force never got off the ground.' But it was the era of the Duncan Sandy's White Paper, which foresaw the death of manned combat aircraft, and promotion opportunities for young flying officers were few.



'I came out of the RAF in 1958 with 750 hours, thinking I knew it all' Nick remembered. But, at the start of his new flying career as a commercial pilot with East African Airways, he came down with a bump: 'I was then put into the right-hand seat of a DC-3 and suddenly found that I knew next to sod all!'

At that time East African was a modest and wholly piston-powered regional outfit, but it had big ideas. Within two years it had begun long-haul flights to Europe with the Comet 4, and was soon in the market for an airliner of the next generation.

'When we went shopping we asked for info from Boeing, Douglas and BAC, and having analysed it we invited them to come for a week to Nairobi answer our questions and explain to us why we should buy their aircraft,' recounts Nick.

'So the Boeing team came one week and made a big presentation. Then the Douglas team arrived. On the third Sunday two junior executives from BAC checked in at Heathrow to fly to Nairobi to sell umpteen million pounds-worth of aeroplanes, but Heathrow was fogged out. When they finally arrived on the Tuesday they were so knackered they were in no position to do business!

'But the VC10 was the only one that could do the job. You could load it up in Nairobi at four in the afternoon with 135 passengers and full fuel, fly direct to London and still have fuel for Prestwick in the tanks. It had no peer on hot and high runways. The Boeing 707, 720 and Douglas DC-8 were non-starters'. Nairobi's 13,500ft (4,000m) runway at Embakasi is 5,300ft (1,600m) above sea level: altitude that unacclimatised arrivals from Britain would

Clockwise from above

EAA's 5X-UVJ on finals. The aircraft, a Type 1164, is now operated by the RAF as VC10 K3, ZA149. Quality Aviation Photos International, via author

VC10 Standards and Supers of Gulf Air and East African fill the Filton hangar. Both airline's aircraft were eventually put back into operation with the RAF. Austin J. Brown/Aviation Picture Library**The**

Man and machine reunited at Brize Norton as ex-EAA Capt Nick von Berg gets acquainted with 'his' 5Y-ADA (now ZA148). Alan Harper

The Super VC10, with its uprated Rolls-Royce Conway 550s and central freight hold was the ultimate model of the type, and was arguably the finest airliner of its time.

East African's operation of the VC10 pushed the airline to the pinnacle of the region's air travel. Quality Aviation Photos International, via author

VC10 in East African colours. The RAF took these machines on after the airline ceased operations, and what was left of the fleet arrived back in the UK in 1977. Quality Aviation Photos International, via author

notice when they tried to lift their luggage in 30deg heat. On jet engines it had a similar effect. Indeed, even the mighty Boeing 747 could not take off fully laden from Nairobi on a hot day.

'But you paid a penalty,' says Nick. 'If you want to be first away from the lights, your fuel consumption goes up: it was very thirsty. And noisy too — we were always getting noise violations from Heathrow. You'd get a letter in your pigeonhole saying you'd rung the bell — black mark.'

SUPER STUFF

Sales pitch over, EAA opted for the type 1154 Super VC10, with the extended fuselage, uprated Conway 550 engines and freight hold between first class and economy. It was the ultimate model, the finest British airliner ever built and arguably the finest in the world in its day. The 1960s were a time of unparalleled optimism for the newly independent nations of East Africa. Kenya in particular became the destination of choice for adventurous German and American tourists of the post-war generation. Coastal resorts boomed as the cities sprouted high-rise hotels, and the five-strong fleet of ultra-modern, brightly-painted Super VC10s became a potent symbol of this spirit across the world.

The first, 5X-UVA, entered service in October 1966, followed a month later by 5H-MMT. The Kenya-registered 5Y-ADA joined the fleet in May 1967, when an order was placed for a fourth jet, 5X-UVJ, and an option taken on the fifth, 5H-MOG.

ADA was almost immediately involved in a drama that could have had catastrophic consequences. Soon after take-off from Bombay on a night flight to Nairobi, the flight engineer made an emergency trip to the lavatory with dysentery cramps picked up during his rest days at the stopover hotel. He told the captain his panel was 'safe', with all booster pumps at 'on' to ensure a steady flow of fuel to the Conways as the aircraft climbed through 20,000ft. While he was gone all four engines spooled down and the aircraft began a rapid descent from 15,000ft towards the Indian Ocean while the captain bellowed, 'Someone get the bloody engineer!'

Several thousand feet were lost as the crew watched the flight engineer go through the re-light procedure for each engine in turn. Full power was restored, altitude regained and the flight continued to Nairobi.

Perhaps embarrassed at having allowed his engineer to fly in an unfit state, the captain told investigators from EAA, Rolls-Royce and BAC that icing had caused all four engines to flame out — a most improbable explanation, but he stuck to it. In fact what probably happened was that a serious build-up of water in the fuel, common in Bombay during the humid monsoon season, had not been drained before departure. The boost pumps, drawing from the bottom of the fuel tanks, had sucked it up and extinguished the engines.

Super VC10 data

Length	171ft 8in (52.32m)
Wingspan	146ft 2in (44.50m)
Height	39ft 6in (12.04m)
Wing area	2,932 sq ft (272.4 sq m)
Wing sweep	32.5 deg
Basic operational weight	156,828lb (71.14 tonnes)
Max payload	58,172lb (26.39 tonnes)
Max take-off weight	335,000lb (151.96 tonnes)
Max landing weight	237,000lb (107.50 tonnes)
Engines	Four Rolls-Royce Conway 43 (Mk550) turbofans, 22,500lb (10,200kg) thrust
High-speed cruise	505 knots (936km/h)
Long-range economy cruise	476 knots (882km/h)
Average approach speed	137 knots (225km/h)
Field requirements (max weights)	9,220ft (2,810m) at sea level 10,120ft (3,085m) at 5,000ft (1,524m)
Landing distance (max weights)	6,460ft (1,969m)
Cabin length	105ft 0in (32.00m)
Cabin width	11ft 6in (3.51m)
Cabin height (max)	7ft 7.5in (2.32m)
Max high-density seating	174 at 33in pitch
Typical seating	16 First Class, 123 Economy at 34in pitch
Total freight volume	1,842 cu ft (52.16 sq m)

Ironically, given the VC10's reputation as a pleasantly quiet aircraft for passengers ('You leave all the noise behind you', ran one advertisement) only one passenger noticed the engines run down. He demanded a stiff drink on the house.

By 1971 EAA had a network of routes that reached out from its Nairobi hub across southern and west Africa, eastwards to Hong Kong via India, north to seven major European capitals and across the Atlantic to New York. But on the ground all was not well. Domestic fares were pegged too low, established competitors from Europe and the US were competing aggressively for the tourist market, and promises made by New York travel agents had not translated into bums on seats. The airline was over-stretched, under-capitalised and although carrying more passengers each year, was starting to make large losses.

Into uniform — RAF VC10 K3 ZA147 (ex-5H-MMT) refuels C1 XV07, as seen from ZA149 (ex-5X-UVJ).

Generation game — Eurofighter ZH588 refuels from VC10 K3 ZA149 (ex-5X-UVJ) in ARA 13 over the Irish Sea, as C1 XV107 sits beyond. Alan Harper

Nevertheless, morale among flight crews remained high. In August 1971, with the captain's permission, the co-pilot of 5H-MOG en route from Dar es Salaam essayed a 'dead-stick' landing at Lusaka, closing the throttles at 39,000ft with the aim of not touching the throttles again until the runway threshold. He got it wrong. The rate of descent approached 6,000ft per minute as the airspeed climbed past the full-flap maximum of 186kts, but he stuck to his guns. The captain called finals, but the tower couldn't see the VC10. 'Look higher,' he replied from the plummeting jet.

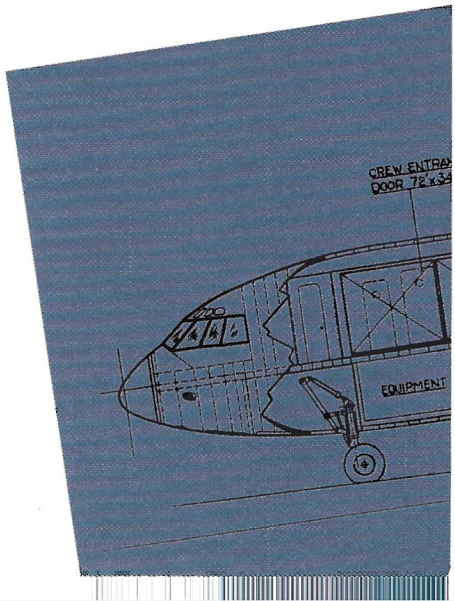
At the airfield fence the pilot called for 90% power to reduce the rate of descent, and the flight engineer pushed the throttles to the stops. It was a perfect touchdown, if rather fast — but the flight crew were so embarrassed they kept the cockpit door shut until the last shaken passenger had disembarked.

Three days later the same first officer was sitting alongside Nick von Berg in 5Y-ADA on an Entebbe-Nairobi leg. 'He never mentioned it,' recalls Nick drily.

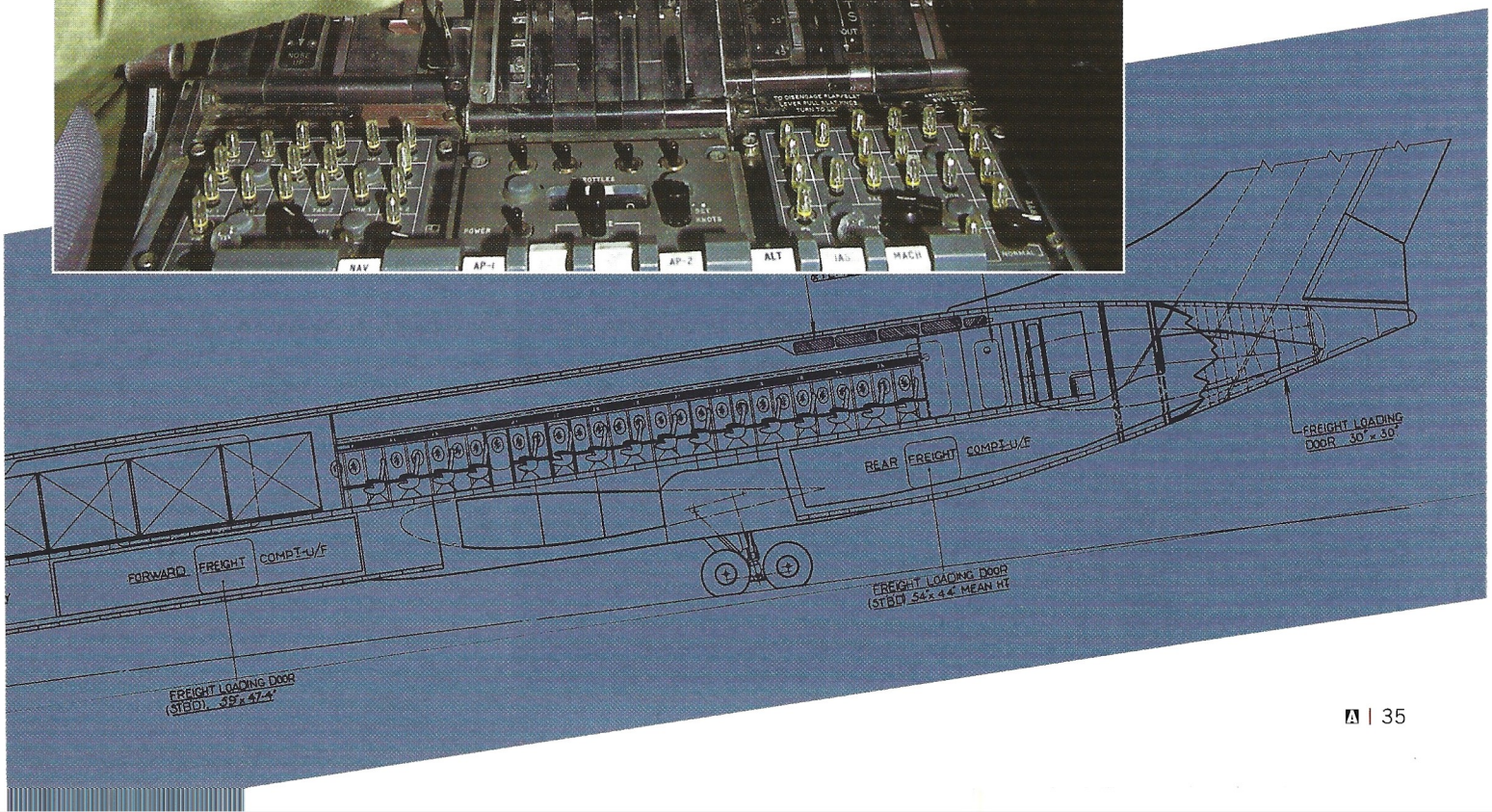
DOWNFALL

The Addis Ababa crash in April 1972 piled misery upon mismanagement. Take-off was aborted at 160kts after runway debris burst a front tyre. There was no safe run-off area and a drainage ditch stripped off 5X-UVA's undercarriage as the aircraft careered down a slope at the end of the runway. In the impact and fire 39 passengers and crew died. A wrongly-reassembled brake was later found to have contributed to the disaster: BAC engineers calculated that had all of UVA's brakes been working, it would have been able to stop before the ditch.

Corruption and incompetence continued to chip away at EAA's credibility. Arguments grew between the member states of the airline's parent countries, with Kenya accusing Tanzania and Uganda of falling behind with their financial contributions. Then Idi Amin seized power in Uganda and the East African Community itself began to



Steady... Two ex-East African VC10s meet in British skies as RAF VC10 ZA149 (ex-5X-UVJ) prepares to refuel from ZA147 (ex-5H-MMT).
Alan Harper



A cut-away drawing of the Vickers Super VC10 CPF, showing typical airline accommodation, with five 108in x 88in pallets and 93 Economy Class seats at 34in pitch.
Aviation Picture Library

come apart. The policy of 'Africanisation', replacing expats or 'colonials' with local workers, was steadily reducing the pool of experience in the hangars, at the check-in, and in the air. The letters pages of the East African Standard were filled with questions and criticism, and the paper's writers took the airline's management to task. A committee of inquiry was set up by the Legislative Assembly to look into the airline. Its report was damning. American managers from Eastern Airlines were drafted in by the National Bank of Kenya to clean up EAA's act, but even they couldn't do anything about volatile East African politics and the oil crisis of 1973. Credit began to dry up. Fuel prices soared. The thirsty VC10s, so recently a symbol of optimism and progress for East Africa, were now a liability.

THE LAST STRAWS

In December 1973 5H-MOG was en-route from London to Nairobi via Frankfurt and with strong headwinds forecasted, the decision was taken to divert to Tripoli to take on extra fuel. However, the local Shell man had his instructions from head office: no credit for EAA. It was the middle of the night and no-one knew them in Tripoli. No-one with any seniority could be raised in Nairobi. The crew were wondering whether they had enough fuel to make Malta when a first class passenger came forward and asked if he could help. It was the president of the Bank of Abidjan: his hand luggage contained several million dollars in cash.

There was further embarrassment, with expensive consequences, when an inexperienced fitter caused 5Y-ADA to slip off a jack in the hangar, coming to rest nose-up with the jack punched through one of the engine beams. There were no spares for such components: a new one had to be manufactured at Weybridge and spliced and plated onto its twin. To this day 'ADA is slightly heavier than her sisters.

THE VC10 AT WAR

'The RAF tankers are *always* on station and on time.' Not a mission statement from Whitehall's Ministry of Corporate-speak, but a testimonial from a US Navy F-14 pilot which was posted on the GovExec.com website during the height of the bombing of Afghanistan.

'Over time you get a feel for who are the cool tanker drivers and who the dolts are. The dolts? US Air Force guys, of course. Love all the gas they carry, but they have no personality whatsoever. Cool tanker guys? The Royal Air Force! Love those guys. They will always go the extra mile (literally) to make sure you get your gas when and where you need it.'

Flt Lt Dave Bellis, VC10 loadmaster with Brize Norton's Standards Evaluation Unit, plays down the heroics. 'It sounds a cliche', he says, 'but it's what we're paid to do. Oh dear,' he adds. 'I can't believe I said that to a journalist…'

'There's always the unforeseen, of course,' he concedes. 'But you have all the intel: you know you're not standing into danger'.

Flt Lt Jez Lewry of No 101 Squadron, a navigator who re-trained as a pilot and spent a month based at Seeb, Muscat, flying ops over Afghanistan, agrees with Bellis: 'There's no defensive aids suite, of course, and you're going into the relative unknown. But it's concerning, not frightening.

'When we were operating in a deployed environment, the most dangerous elements were the carts wandering across the runway, or the FOD risk. The other main danger was the sheer number of aircraft up — there were plenty of close calls.'

He had heard that the US Navy pilots seemed to favour the RAF tankers over those of the USAF. 'Their approach was quite rigid. We take a more flexible attitude. If they want to go nearer their target or CAP area, we'll try and accommodate them.'

'You've got a pilot who's just been in action, running on fumes, and we know we can hang around for another 20 minutes,' adds Bellis. 'It's not a problem. It's our role: we're meant to be there for the fast jets.'

US Navy

With EAA well behind in its stage payments to BAC for the aircraft, efforts were made to sell the VC10s and replace them with more economical American-built jets from Eastern.

South Korea and Cuba were approached, but to no-one's surprise they could not be persuaded to invest in these exotic, expensive British aircraft. Soon afterwards the airline was declared bankrupt. The last service was a VC10 flight from Frankfurt to Nairobi in January 1977, bringing a plane-load of German tourists to Kenya's game parks and beaches.

'It was very sad,' recalls Nick von Berg. 'It was a wonderful airline. We built it up from a bush outfit into a service that stretched from New York to Hong Kong. It's hard not to feel bitter.' After 16 years with EAA he had seen the way things were going and jumped ship in 1974 to join Gulf Air, flying Standard VC10s and then TriStars.

The beautiful VC10s sat at Nairobi for four months, before being repossessed by BAC and flown back to Filton between May and August 1977. There they were mothballed for many years. Out of the mess of East African, Kenya Airlines was born, a small African airline with modest ambitions — and Boeing jets.

HELP THE AGED

Despite the age of the RAF's tanker fleet, the aircraft are called upon more now than ever before. Their Oxfordshire refuge from the pace of operational tasking offers full servicing facilities inside this huge maintenance bay. Testament to the service provided here, the crews' flying skills and even the original manufacturer, the reliability of these elderly machines is rarely an issue. Alan Harper

SO WHAT'S NEXT?

Although the end of VC10's career is still a little way off, the heat is on in the race to replace this venerable machine in the RAF tanking role. Of the parties bidding to win the contract, AirTanker has recently spoken out about its chances of being selected.

The Chairman of the Board of Directors for AirTanker, Peter Smart, confidently told the press at a recent briefing that 'We believe we are in the best shape to win the FSTA competition and we are committed to delivering this capability through PFI'.

AirTanker is one of the consortiums bidding to operate the RAF's Future Strategic Tanker Aircraft (FSTA) through a government-directed Private Finance Initiative (PFI). The rival bidder, Tanker and Transport Service Company (TTSC), includes BAE Systems and Boeing. AirTanker's proposal for FSTA is based on new-build Airbus A330-200s, while TTSC is offering second-hand Boeing 767-200/300s.

AirTanker believes that 19 A330-200s would be the optimum number needed to fulfil the FSTA task, supported by 600 personnel. This would represent the second largest order for the type, with AirTanker's figures allowing for a third of the fleet to be on task during peacetime, another third either on maintenance or awaiting tasking, while the final third could be available for civilian charter work. 'There is no restraint on where we can operate an aircraft, it could be for a third party anywhere around the world', claimed Smart. 'It could even be used on the charter market over the weekend, then return to the RAF the following week'.

Significantly, this AirTanker briefing came within weeks of a Ministry of Defence decision to defer the FSTA decision by a year. If AirTanker wins, it will operate from new facilities at RAF Brize Norton, which it must invest in under the PFI. This would comprise a giant new hangar capable of handling two A330s, an integrated Tasking and Operations Centre, a Training Centre and a new squadron headquarters. Current planning envisages the whole complex being constructed opposite the existing hangar site built in the 1960s.

Interestingly, AirTanker refuted a USAF evaluation of the Airbus A330 as being too large for its new air-refuelling requirement. It was this assertion from the USAF that allegedly formed part of its argument to reject the Airbus A330 in favour of the Boeing 767. Peter Smart said; 'We believe we will be in with a shout in future USAF programmes, if AirTanker is selected by the MoD'. MARK ASHLEY

INTO UNIFORM

The RAF has operated the VC10 since 1966, when it took delivery of its fleet of C1 transports. These were a hybrid design specially built for the service, essentially comprising the Standard fuselage married to the improved wing of the Super (the Standard wing had left much room for improvement, especially at 20,000ft when the differential between high-speed and low-speed stall buffet came down to a few knots) plus the uprated model C43 Conways, and the Super's side cargo door and fin fuel tank. The cabin could be configured for any combination of cargo, passengers or stretchers. Each one was named after an RAF winner of the Victoria Cross.

Through the 1960s and 1970s the RAF operated this fleet of elegant transports as a military airline, carrying supplies, service personnel and their families, and diplomatic staff all over the world. The enormous 'Base One' hangar was constructed at Brize Norton to accommodate the jets, which at the time were the RAF's largest-ever aircraft, and to provide the full engineering and service support that continues today.

In the late 1970s it was recognised that the RAF's Victor tankers weren't going to last forever, and the MoD's thoughts turned to a ready-made fleet of heavy jets in the shape of the four repossessed EAA Super VC10s and the five ex-BOAC Standards which were by now being retired from Gulf Air. Vickers had always had plans for its VC10 in the air-to-air refuelling role, and these were finally realised as five cylindrical 700-gallon fuel tanks were fitted in the cabin of each aircraft behind the few rows of seats (facing backwards) retained in the 'first class' section. Hose drum units were fitted under the wings, the extra weight of which requires constant 'aileron upset' in flight, reducing lift at the wingtip to avoid overstressing the wing. Also, after considerable modification, a central hose was installed under the tail, which in practice is seldom used.

The new fleet of nine jets, designated K2 (Standards) and K3 (Supers) entered service with No 101 Squadron from 1984. The last K2 was retired last year, but the ex-EAA Supers still soldier on.

The Victors, pretty much time-expired by the end of the Gulf War, were finally withdrawn in 1993. The spotlight now fell on another group of retired VC10s, ex-BOAC/BA Supers which had been sitting idle at Abingdon and Brize Norton for over five years. Of 11 airframes, five were found to be salvageable, and these were converted at Filton with the addition of wingtip and centreline HDUs. Extra tanking was not installed; the aircraft dispense fuel from their own wing and belly tanks, and the cabin seating has been retained.

These 'new' tankers were added to No 101 Squadron's inventory from 1990-96 as K4s and swelled the squadron's fleet to 14 (before the K2s were retired). During the same period HDUs were added to the 13 remaining C1s of No 10 Squadron (XR809 was bought out of the RAF to serve as an RB211 engine testbed, and was later scrapped), providing another string to the bow of this already versatile type, and changing its designation to C1K.

Although the two VC10 squadrons at Brize Norton nominally 'own' their own aircraft, in practice the machines are pooled and indeed often fly with mixed crews: the tanker squadrons are among the busiest in the RAF and there are never quite enough crews or aircraft to go round. Indeed, this problem is confounded by an ever-increasing requirement for overseas support of UK and Allied assets, on top of the 'behind the scenes' work undertaken to support fast-jet deployment and general UK-based refuelling duties. The RAF tankers (TriStars included) certainly perform a vital role in these times of forces overstretch — a role that often does not get the limelight that it deserves.

For the pilots, the differences between the Standards and Supers, and between the ex-airliners and the original RAF types, are negligible, although the Super's 13ft (3.96m) of extra fuselage length compared with the Standard — 'that great long nose', as Nick von Berg puts it — does make the aircraft less comfortable on the flight deck during severe turbulence. 'It's almost like a whiplash effect' he grimaced.

The average age of the VC10 airframes currently serving with the RAF is 35 years, and it will be at least 40 by the time they retire. But they were beautifully built — 'milled from the solid', as it's often said — and although spare parts and engine serviceability are increasingly problematic, structurally they are in good shape. And the hardbitten professionals who fly them — in most cases younger than the airframes themselves — regard their venerable jets with the affectionate esteem that is only bestowed upon the truly deserving: a classic aeroplane.

Recommended reading: *Vickers VC10, by Lance Cole (ISBN 1 86126 231 0). Published by The Crowood Press, Marlborough. East African: An Airline Story, by Peter J. Davies (ISBN 0 95230 470 8). Published by Runnymede Malthouse Publishing.*