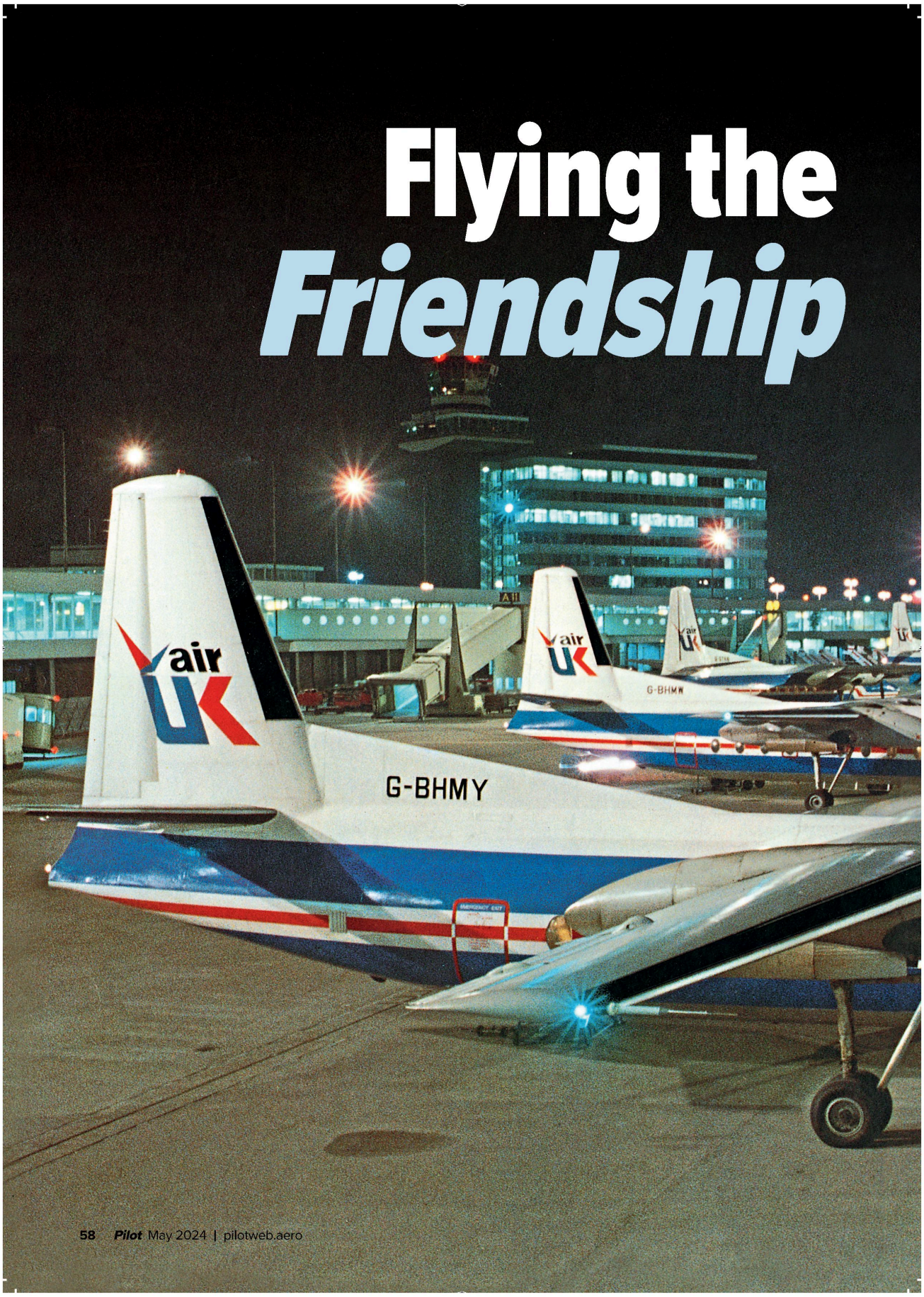
Flying the *Friendship*



A former airUK pilot recalls the pleasures and pitfalls of flying the F.27 – a fantastic aircraft that taught him his trade

Words: Pete Brand
Photos: Pete Brand and Keith Wilson

Captain Peter Brand in his airUK days

"Ok, speed good, gear down." It's the early eighties and we are out over the North Sea carrying out an air test on Fokker F.27 G-BAUR following maintenance. Just the first officer, an engineer and myself are on board. With a hiss, the pneumatics extend the gear – it takes up to fifteen seconds. *Clonk, clonk*... and that's it. The port main gear has not extended.

Seen here on surviving airUK F.27-200 Friendship G-BHMY, the port main undercarriage leg and doors

Preserved at the City of Norwich aviation museum and 'looking for all the world as if it's ready to go out on its next service', MY's cockpit

With its high wing design, the F.27's gear can be seen from the passenger cabin so the engineer is despatched to see what's going on. He soon comes back with a white face, "it's jammed up against the undercarriage doors". For me, if it had to happen the circumstances couldn't have been any better – no passengers or cabin crew to worry about, and a crosswind from the right at base, so I can yaw it to the left, plant the starboard main gear down and hold the port side up till the very last minute. Also, we are not fat with fuel.

We recycle the gear to see if we can bust it out, but to no avail and so we make a plan for landing. I am confident with the aeroplane and comfortable in my familiar seat, it's like a well-worn old armchair.

Being an aerobatic enthusiast, I decide that before returning to base I'll just have one try at pulling a little g and throwing the gear out at the same time. "Bang" the leg shot out, destroying the gear door as it went.

We landed safely and afterwards I nevertheless got a phone call to see why I hadn't used the emergency gear extension procedure! This being asked even though we had plenty of pressure in the main system, an engineer on board, were aware of exactly what the problem was *and* that I'd gotten the damn aeroplane back in one piece.

Ok, I wasn't actually congratulated but neither was I admonished. These were days before we had banks of ops manuals telling us what to do in every scenario (and woe betide you if you deviate in any way!) Captains were given the latitude to manage their flights through experience, good judgement, and common sense. We called it 'airmanship'!

NO FLIGHT DECK DOOR

I loved every minute of the five years and 3,500 hours I spent flying the Fokker F.27 Friendship with airUK. I have to say that part of the joy was that we had excellent training, management, and of course wonderful cabin crew.

There was no bullet-proof door to the flight deck, in fact no door at all! It was pre-9/11, and we would often have passengers visit the flight deck or sit on the jump seat. We got to know some of the regulars very well. The lack of a barrier between us and the cabin crew led to a great rapport. We were careful to include the passengers in any merriment, which I

think endeared them to the airline.

Of course, it was hard work for the cabin crew as well. For example, a typical Norwich to Amsterdam flight would take about fifty minutes, chock to chock. The airborne time would be about 35min and for part of that, they would have to be seated for the takeoff and landing. Typically, the complimentary breakfast service ('no frills' was as yet unheard of!) would include newspapers, orange juice, hot breakfast with teas and coffees, a second tea and coffee service, and a duty free service, emergency briefings, securing the cabin; oh, and flight deck drinks as well – we didn't like to be forgotten! That works out to about 35 seconds per customer on a full flight.

The cabin crew used to challenge the flight deck to get random words into the PAs, sometimes quite rude ones! I remember one was 'breast implants', which was skilfully rendered over the PA as "we are flying along the peninsula of Brest in France."

Another game we played was the little lottery, where we would mark the nose wheel tyre with different coloured chalks and the one nearest to the 6 o'clock position at the end of the flight would take the pot. As soon as the last passenger had disembarked, we'd pile out to check who the lucky winner was.

Such was the camaraderie within airUK that we still hold reunions every year.

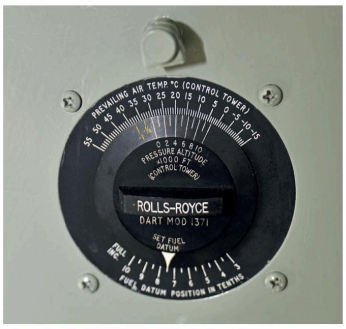
Most of the flying was done at 20,000 feet or below

PASSENGER COMFORT AND SAFETY

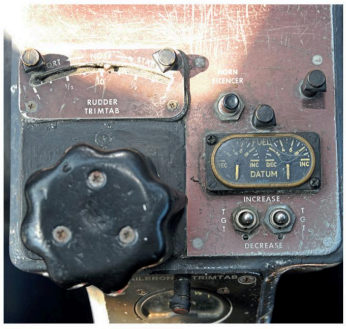
It was comfortable enough for passengers, even though most of the flying was done at 20,000 feet or below, where most of the weather was to be found. There were no emergency escape slides fitted, and if required, evacuations were carried out through the left and right rear doors, the sills of which are four feet above ground level. The forward cargo door was unofficially used, which was just over three feet up, along with two 'under-wing' exits, which were five foot six inches up. I suspect it would have been interesting jumping down from those.

The flight crew could escape through the cockpit side windows – a long way

Overhead panels in what was otherwise a very WWII-era cockpit include the engine start switches



Located in the extreme right quadrant of the overhead panel, the mechanical fuel flow calculator never used in airUK ops



At the rear of the centre console, the rudder trimmer and fuel flow gauges and switches, once operated inadvertently by the flight log!

down – or out through the forward cargo door. The captain of course, would be the last to leave the ship, and would have to check through the cabin to ensure everybody was out before leaving the aircraft. Part of the emergency training was conducted with the airfield fire service, where we practised evacuating from smoke filled cabins.

The passenger seat pitch was thirty inches, so the leg room was generous, but the toilet arrangements were quite primitive, as they consisted of a metal bucket under a toilet seat. The bucket would be removed for emptying during turnarounds. On one particular turnaround a member of the flight deck rushed to the back on an urgent mission. Unfortunately, the cleaner had just removed said bucket! In haste, a deposit was left, and a very red faced person rushed back along the cabin to the sanctity of the flight deck!

ROUTES

Routes for us, from all over the UK would end in Amsterdam, where we were feeding passengers into KLM's long haul network. In order to protect their interests, they eventually took over airUK, and in January 1998 we became KLM uk.

We also served the Channel Islands from Exeter, Southampton, and Heathrow, and provided a main 'bus stop' route for the offshore oil and gas industry, from Norwich or Stansted via Humberside or Leeds, to Edinburgh and Aberdeen. During the turnarounds on this service, we would keep the starboard engine running while disembarking passengers, offloading bags, and boarding the new passengers joining us. These turnarounds would be very quick, taking only ten to fifteen minutes.

Similarly, on the first sector, while boarding passengers on the port side of the aircraft it was routine start the starboard engine for expediency. I heard that in one instance while boarding in this manner the starboard engine caught fire. A cabin crew member told me later that as she was greeting the passengers at the rear of the aircraft, she noticed a bright glow in the corner of her eye and remembered thinking what a lovely sunset it was that night, while continuing to say "good evening sir, good evening sir, good evening madam". In contrast, the 'No.1' at the forward station had quickly grasped the situation and was evacuating passengers through the forward cargo door, shouting "Go, go, go!"

Once on the apron these passengers weren't sure what to do next. I don't know if it was story teller's licence or not, but some say they were rejoining the queue to board again via the rear steps!

FLYING THE FRIENDSHIP

The F.27's flight controls are conventional, cable operated with tensioners to adjust for thermal expansion and structural deflections. The ailerons are fitted with trim, balance and spring tabs, the elevator with a trim tab and rudder with trim and balance tab. Even so, she is heavy to fly, like hauling a juggernaut around the sky. Nevertheless, an enlightened airUK employed the highest proportion of female pilots of any airline at that time.

Starting was simple and once the start button was pressed, he process was automatic. Two 'fuel trim' switches were located on the right hand side of the centre console, with their associated datum dials directly above them. These were to control the fuel flow at different ambient temperatures and pressure altitudes. A setting computer was positioned on the starboard overhead panel. Since we didn't operate from high airports or in extreme temperatures, I can't remember ever using it. We just pressed the start button, opening the high pressure fuel cocks at 1,200-1,500 rpm and watched for the rate of rise of the turbine gas temperature. If it was rapidly increasing toward the maximum of 930°C we would use the fuel trimmer to reduce the fuel flow to keep it within limits. If that wasn't enough, we would 'milk' the fuel cock to achieve the

desired effect. You may be surprised to learn that there was no autopilot or flight director fitted in our aircraft, we continuously hand flew them! Raw data ILS approaches were flown to CAT 1 minima (200ft and 600m runway visual range), sometimes on six sectors a day. The almost universal 'landing drink' at the end of the duty was often well received!

Flight instruments were of the basic analogue type, set out in the T-pattern of the day. They consisted of an airspeed indicator, artificial horizon and altimeter. Below these were an ADF, HSI (combined direction indicator and VOR) and a VSI (vertical speed indicator). A turn and slip indicator was positioned adjacent to the main instruments above, and a RADALT (Radar Altimeter) was fitted retrospectively.

The engine instruments sat in the centre panel in front of the throttles. Apart from the usual oil temperature, pressure and fuel flow gauges, the main parameters for engine operation were TGT (Turbine Gas Temperature), engine torque pressure in psi, and rpm.

The only navigational aids we had were VOR/ILS, ADF, and a DME.

The weather radar was an old cathode-ray tube type set. It took time to warm up and was sometimes referred to as the 'Stevie Wonder' or the 'Ray Charles' due to its limitations! When it was switched on, the ADF needle would go mad and sweep around the dial like a radar controllers display. Once, when cleared to cross the airway at a precise distance east of the Ottringham VOR, I aimed the radar down to map the coastline and set heading accordingly. Crossing exactly at the distance required the first officer was astounded and begged to know my secret! He soon lost interest when I blagged it with some complicated trigonometry. Of course, it was more by luck than judgement...

NDB APPROACHES

Many of the airports that we operated into required an NDB approach (mainly obsolete nowadays). We became very accomplished at flying them. Our standard operating procedure was to establish inbound, or after crossing the beacon 'plummet' to minima and fly level until landing or going around. (This was not unusual, and indeed was the way it was taught during my initial Instrument Rating training). We nicknamed these 'dive and drive' approaches.

After one such approach to Norwich Runway 09, a passenger who was a pilot with a big airline, rather arrogantly came to the flight deck declaring that we were dangerous and that he would be writing to the company, the CAA and anyone else he could think of. I guess he must have been alarmed at the sight of the houses passing below at about 400ft agl.

He must have got busy with his pen as well, because shortly afterward our procedures were amended to fly an approximate 3° constant descent angle, going around as soon as we hit minima (which imitated a stable precision approach). This was undoubtedly safer, but it is a gifted person who can think outside the box and visualise a better way of doing something that has been ingrained through years of training.

Most light aircraft carried more modern equipment than we did

I can't confirm it, but there was also a rumour that we had changed the procedure because when a simulator was finally available, it was found that when flying a single-engine approach, the aircraft would turn on its back as power was applied to fly level at the MDA (Minimum Descent Altitude).

We were amused by the fact that most light aircraft carried much more modern equipment than we did. Physical flying skill was a high priority at the time, rather than the more systems-oriented operation for today's pilot. The atmosphere more relaxed, before the onerous security checking became necessary.

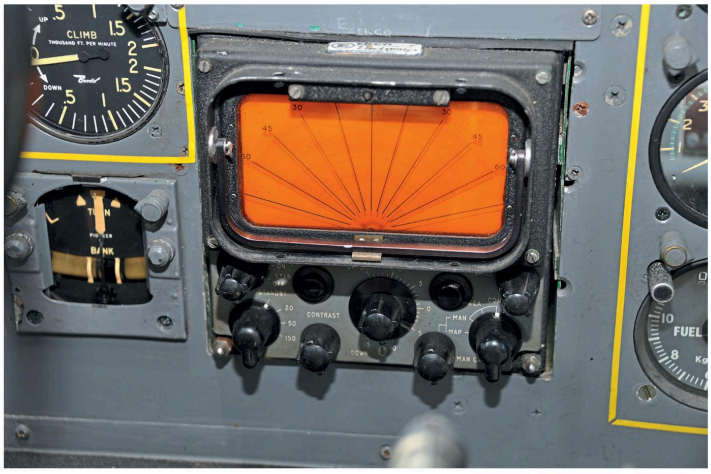
SINGLE-ENGINE & DITCHING

After flying the Piper Aztec, with its single hydraulic pump on the port engine, requiring you to pump like hell on the manual retraction handle, while flying engine out, I found the F.27 rather easy at first. All I had to do was fly the aeroplane! Calling for the PNF (pilot non flying) to carry out configuration changes, action checklists, get the weather and speak on the radio etc.

I soon found out, however, that in reality it took skill to fly. There was no simulator at that time, base checks being carried out on the aircraft itself. The starboard engine is the critical one and when simulating failure on that side it would take full opposite rudder and up to half aileron to keep it straight in the second segment climb, and your leg would be shaking uncontrollably trying to hold it for long periods.

Stalling characteristics were benign, although a wing drop was a possibility with full flap and gear extended. Aileron could be used during the recovery however, and a stick shaker would activate on the left hand control column at a 16.5 degree angle of attack.

During the certification process, ditching was never considered, even though our passenger safety card



Sometimes referred to as the 'Stevie Wonder' or 'Ray Charles' weather radar display, the cathode-ray tube device that was of limited effectiveness

A replacement for the DC-3?

The design for the Friendship originated in the early 1950s, and it certainly looked sleek and modern alongside the DC-3. Two Rolls-Royce Dart turboprop engines, each providing 1,910shp plus 505lb of thrust, were utilised after their success on the Vickers Viscount. Furthermore, two 33-gallon tanks of water methanol were carried and could be injected into the engine to restore it to full operating power in high ambient temperatures, for what was referred to as a 'wet' take-off.

The huge Dowty Rotol four-blade propellers had a 'ground fine pitch', setting that would move the props into a zero-degree pitch after landing, creating two twelve foot discs of drag. Two further pitch stop switches prevented the propellers moving to fine pitch during flight, protecting the aircraft against structural damage (due to asymmetric drag) and propeller separation due to overspeed in the event of propeller control malfunction.

The F.27 was sold on the premise of passenger comfort, the claims being that there was much less vibration and that the Darts were much quieter than previous radial piston engines. Someone must have been spinning a line here because these turbines were so loud that the high pitched and shrill whistle was part of the character of the aircraft that you just could not ignore. An AME once said that he could tell whether his patient was a captain or a first officer on the F.27 due to which ear was more high tone deaf! (And yes, I have tinnitus in my left ear.)

They were, of course, much more efficient than piston engines at the higher flight levels. The service ceiling was 23,000 feet with passengers on board and of course it was one of the first pressurised aircraft.

Construction of the Friendship was rather innovative, don't titter in the back please! The airframe was glued together, rather than riveted. Redux (a contraction of Research Duxford) was a formaldehyde-based metal glue, and was said to make stronger joints and also better to withstand the severe conditions that aircraft are exposed to. The airframe is also aerodynamically cleaner and the lack of rivet holes benefitting pressurised fuselages.

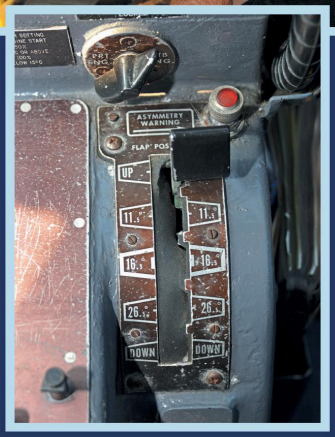
The F.27 was designed to operate from unprepared strips and remote areas, so it utilised pneumatics rather than hydraulics (hydraulic fluid may not have been available or stored at these remote locations), while the high wing kept the props away from the ground, where they may have been vulnerable to debris and FOD. The spin off from that was that the passengers had a great unobstructed view downwards from the cabin windows.

The brakes and the nose wheel steering were pneumatic, and it had a character all of its own, with the "psst, psst, psst" sound of the system, as you meandered to the holding point. An isolation bar, located behind the captain's seat, was pulled out while the aircraft was parked overnight, to avoid leakage by cutting off the pressure to the services. Unfortunately, the isolation bar also made an ideal coat hanger, and many captains taxied off, inadvertently taking 'a short cut across the grass', as they groped for the bar to reinstate nose wheel steering and brakes!

The three pneumatic bottles – main, brakes and emergency – were kept pressurised by engine-driven compressors. While flying circuits during base checks, the pressure would have to be carefully monitored, due to the continuous operation of the gear etc, and often when the pressure reduced, we'd have to fly with the gear extended to give the system a chance to catch up.

The Dunlop Maxaret anti-skid braking system was also a recent innovation incorporated into the design. It was found to reduce landing distance by about 30% and avoid tyre bursts and flat spots due to skidding. During our walkaround we would test the Maxarets by spinning them up with our foot while listening for the pressure release. I recommend ensuring that chocks are in place while doing this, as one Captain was last seen desperately hanging onto the undercarriage drag strut as the aircraft gathered speed rolling downhill until it found its own chock in the form of a catering van! The last vestige of brake pressure had been released when he'd spun up the Maxarets.

Large, electrically-controlled fowler flaps had the following settings: 0, 11.5, 16.5, 26.5 and 40 degrees. Takeoff was 0° or 16.5°, cruise 0°, approach 16.5° then 26.5°, and landing 40°. We never used the 11.5° setting and, in fact, never found out what it was there for! The flaps could be manually extended by de-pressurising, pulling the circuit breakers on the flap control and brake, and going into the passenger cabin with a crank handle, removing a plug between the wings, and winding away.



Matt Taylor demonstrates the manual flap extension crank

Multiple settings for the flap lever include a curious 11.5° never used

instructed the use of the underwing exits only for such an event. Once, over the North Sea, my first officer opened the metal cover of our technical log. It rested between the trim wheel and the fuel trim switches. As I retrimmed, winding the wheel back, it pushed the cover against both fuel trim switches at once, with the resulting sudden large reduction in rpm, on both engines! Following the usual, 'universal exclamation' used by pilots in these circumstances, and the instant thoughts of pioneering one's own techniques during a ditching, it dawned on us just what had happened, and we were quickly able to remedy the situation.

Generally, it was a simple aircraft, with easily understandable systems. The emergency checklist consisted of only 23 items, compared to the *War and Peace* volumes of the 'quick reference' handbooks of some of today's electronic masterpieces!

The F.27 was also one of few aircraft that were able to be operated from surfaces with declared 'braking action poor'. On one occasion, I saw the end of the runway at Humberside far too close for comfort. It was also one of the only times I heard the anti-skid system working.

ICING AND GALES

The aircraft was cleared into moderate icing only. De-icing being accomplished electronically on the props and the engine intakes, and with pneumatically operated rubber boots on the leading edges of the wings, tailplane, and fin. They had to be used carefully, you had to be patient and wait until about 1/2in of ice had accumulated before inflating the boots, otherwise you risked pushing soft ice forward where it would freeze solidly, creating a void behind, where the boots would then inflate and deflate completely ineffectively.

On a sector between Aberdeen and Edinburgh we were once caught in rain ice and experienced severe icing below a warm front (one of the worst possible icing scenarios). Glaze ice formed so quickly that with speed decaying we were unable to maintain altitude. Deliberately mishandling the throttles in an effort to shed ice from the props, we turned out to sea in a constant descent, eventually flying low along the Firth of Forth and landing on Edinburgh's Runway 24. That was one flight that I was glad was over!

During the gales of '87, I was rostered to fly four sectors. Leeds Bradford-Belfast-Leeds Bradford-Amsterdam-Leeds Bradford. I'd decided that if I could get the aircraft along the taxiway which was a significant crosswind, we'd have a go at it.

Generally, it was a simple aircraft with easily understandable systems

As we struggled heads-down against the wind to get to the aircraft, a ladder which had been left on a ground power unit got airborne of its own accord and disappeared over our heads! Maybe we should have called it a day there and then, but we were 'go orientated'.

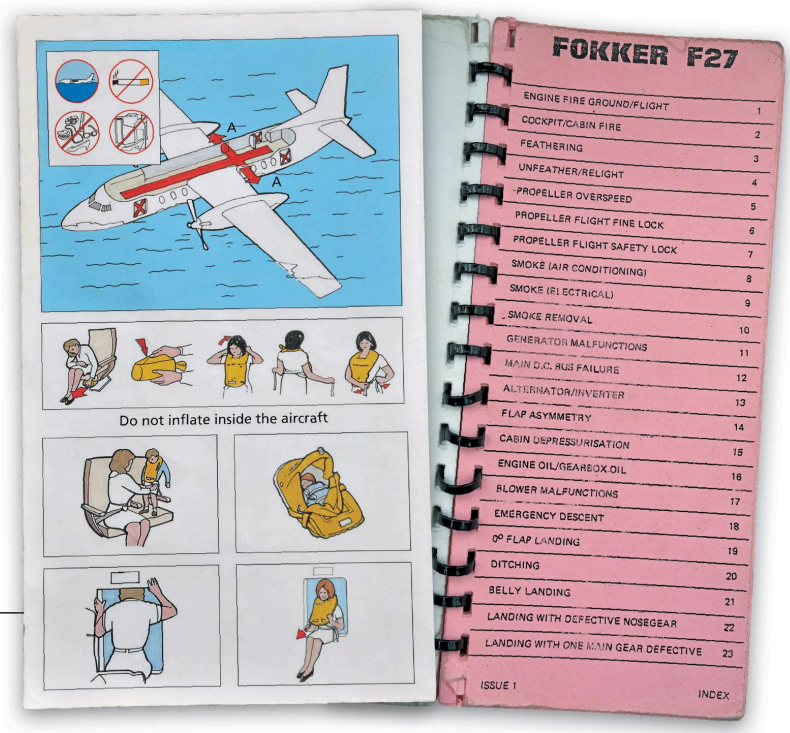
We got airborne without a problem and once having climbed above the low level turbulence, the flight was pleasant enough, although the ground speed was pitifully slow. Thankfully, the wind was down the runway at Belfast.

Returning to Leeds Bradford, the wind was directly across the main runway, so we flew the ILS for Runway 32 and made a visual circuit to land on R27, a runway that has since been closed. As we broke for the visual circuit, the ground speed downwind was incredible and you can imagine the turn onto final with that amount of drift! The final wind check given was "gusting 93 knots"!

The ground speed on the final approach was next to nothing and that led to an 'as smooth as silk' landing, accompanied by a tumultuous applause from behind.

The cabin crew later commented that they'd never seen the fuselage twisting and groaning like that before. The view from the rear of the cabin along into the flight deck must have looked alarming as the tail twisted from side to side.

Amsterdam found us an into-wind runway, and as the cloud base at Leeds had lowered considerably,



Passengers were instructed to escape via the underwing hatches only after ditching and the emergency checklist was brief by today's standards

FO's view of the starboard wing in icing conditions

Back in the 1980s, passengers not only had a view of the cockpit but enjoyed ready access too

and we wouldn't have been able to carry out the visual circle to land procedure again, we diverted into Humberside on that last sector.

Throughout airUK's operation with the F.27, we only had four incidents of note – a testament to the aircraft's strength and serviceability. The first incident in October 1984 was dramatic, when G-BHMZ was on a flight from Leeds to Charles De Gaulle and suffered flutter of the rudder trim tab, eventually causing the rudder to jam at full right deflection, 15-20° of left bank being required to maintain directional control. The port engine then ran down due to the fuel collector tank emptying, perversely this assisted in control. Skilful flying brought 'MZ into an emergency landing at the French military airfield at Creil, north of Paris. It was only during the landing roll that control was finally lost, the aircraft running harmlessly off the right side of the runway. If ever an award for flying excellence was deserved, surely this would qualify?!

In September 1987, G-BAUR landed at Stansted with an unsafe nose gear. There were no injuries and only minor damage. In July 1990, G-BCDO was skilfully landed at Amsterdam with an unsafe starboard main gear. Again, no injuries to passengers or crew but the aircraft was eventually written off.

Lastly, G-BNCY had a landing accident at Guernsey in December 1997. The aircraft landed long on a wet runway with wind shear on the approach and a very strong crosswind. The runway is just 1,463m long and the aeroplane overran into the safety area, the starboard gear collapsing in the soft ground. Passengers and crew were safely evacuated but the aircraft was damaged beyond repair.

MY TIME WITH airUK

I was told early on in my career with AirUK to fly smoothly so as not to spill granny's G & T in the back; that stayed with me throughout my subsequent career. I started out on the F.27 as a first officer, I gained my first command on her, and I finished as a training captain, before moving on to larger jets.

What a fantastic aircraft to cut my teeth on; the F.27 taught me my trade. I wish It was possible to go back and do it all over again!

If you want a chance to see what the fuss is about, the City of Norwich aviation museum has one of our aircraft on display, looking for all the world as if it's ready to go out on its next service. I must visit again soon and commune with my old friend.