Antonov AN-2

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Popham on an English summer's day, the field en fete for an Air Ambulance fundraiser; tents, dogs and daisies, and the tranquil buzzing of lazy aeroplanes in the circuit. Down into the arena come the parachutists, all five square on the mark in the face of a blustery breeze, then in the overhead we see the machine from which they fell ? an elderly biplane to which all eyes are drawn because in contravention of every law of physics it has stopped dead in mid-air.

At least it looks like it from where the crowd is standing; in fact it sideslips slightly into wind, making maybe ten knots over the ground, hanging on the prop with little more than 35 knots of air over the wings. Slats extended, flaps at 40 degrees, throttle on the high side, it hovers nose-up like a kestrel hunting mice at the roadside. Such a party trick is the province of few conventional fixed-wing aircraft; the Fieseler Storch can pull it off, but this old biplane can hold six tonnes aloft and fly backwards in anything of a wind. It is of course the massive, magnificent, ludicrous, lovely Antonov An-2. Fabled as the world's biggest single-engined biplane, the Annie makes other aircraft look, sound and feel anaemic, and once you have flown her you will always have a high mark against which to measure life's experiences. She pokes up two big fingers at the quaint notion that if it looks right, it'll fly right ? she's living proof of the fact that if you pack in enough power, you could get Tower Bridge off the ground.

Wrestling all that drag around calls for thick neck muscles and bulging thighs; the An-2 really ought to be flown by a Russian lady shot-putter or a tattooed gentleman in a string vest with his arm out of the window. On the ground, she trundles and lumbers and clanks and blats and hisses, and in the air she does the same. Flying her is like conning a barge, landing her like running aground, and everything from chocks to chocks is accompanied by flames and smoke and the

kind of noise you'd get if every bank clerk in the Home Counties revved his Harley in unison and gloried in the over-run.

Bill Leary has the fathomless good fortune to fly this puppy regularly and he wears a near-permanent grin. He took me for a jaunt around Hampshire to get some stick time, and strange though it may seem, you can do the same if you have a PPL(A) ? the aircraft comes in a shade underneath the weight limit for the ticket. Although I couldn't log the time I could log the aircraft, which I've done as P2. One day I'll look back on that entry and laugh ? a lot.

HA-MKF is owned by James Black, who has wanted an An-2 since he first experienced the inside of one while flying in the World Aerobatics Championships in Russia before the Wall came down. A Polish-built late model, KF differs little from the 1946 original ? the aircraft was never really developed during its long production run. The instruments and systems were adequate in the Paleolithic era, when Russian pilots apparently had the three arms you need to start her up and the gorilla muscles required to motor her around, and they still do the job today. The Annie is where aeronautical engineering meets blacksmithing; she was designed to be maintained by farm boys in the Siberian wastes, and all they needed were big spanners. She can suck up her own fuel from a connector under the belly, where there's also a compressed air take-off for inflating the tyres. What tyre pressure is required? Consult the manual, and do you know what it says? "Inflate until round."

The An-2 was built as a Jack of all agricultural and industrial trades, a short-haul, twelve-passenger airliner, a freighter, a crop sprayer, parachute dropper, firefighter, an air ambulance, a troopship and a military scout with machine guns and rockets, even a VIP transport with five plush seats; hot weather versions have been built, cold weather variants, they've put a jet engine in one and they've been mounted on wheels and skis and floats. I saw one once that doubled as a McDonalds in Budapest; this is far from the most unusual use to which this extraordinarily versatile aircraft has been put.

She has awesome presence. The An-2 is like a seaside blockhouse with five portholes, some random cables and a little conservatory on the roof. Bill and I

were joined on the walk-round by James Black, pilot Chris Thompson and ground crew Ernest Tipper, aged 83, and Cullum Hall, aged 14. I was only slightly surprised when Bill produced the first tool required, a twelve-pound mell hammer. As it happened, this was only to knock out the huge spikes to which KF was tied down. The second tool was a big stepladder for reaching the slat locks. You can climb up onto the top wing via kick-ins in the fuselage but the aircraft slants sharply down towards the tail and at Popham it was parked pointing uphill, so the angle was impossible to negotiate without crampons.

In Russia pilots don't do walk-rounds ? they sign for the aircraft and fly it away, and if there's anything wrong the engineer carries the can. Luckily we're in Hampshire, where a walk-round can take an hour and a half if you're on your own, James tells me. Much of this time is taken up walking the four-bladed prop backwards to clear oil from the bottom cylinders of the nine-pot WSK Kalisz ASz-62 engine, a licence-built copy of a Wright Cyclone tweaked to 1,000hp. I joined in this process after a briefing that basically said you don't let go of your paddle until the next guy has taken the strain because the prop may spring back and cleave open his skull. Shoulder to the wheel, Volga Boat Song playing in the mind, our little chain-gang walked through 36 heavy blades, stopping midway to empty the oil bucket hanging beneath the engine. The aircraft has a 22-gallon oil tank, and the 'min' mark stands at 13 gallons.

Actually, the An-2 is just like other biplanes, only there's more of it. The wings are vast, the upper span 13 feet greater than the lower, the lower wing having a full-span flap, the upper having an inner flap and an outer aileron. The fuel fillers are atop the top wing, and the nozzle is hoisted up on a rope. (The self-filler under the belly is very slow and isn't used). The tanks hold 1,300 litres, and that might carry you and a dozen mates for 500 miles, not very fast. Fuel feed is by gravity; in the cockpit you can select left, right or both, but you leave it on both.

Entrance is via a fuselage door, which is bolted inside a much bigger cargo door; changing over is the work of five minutes. Turn left towards the cockpit or right through a door into the tail section ? here's where you'll find the porta-potty (you'd burst before you'd use that thing) and two heavy-duty 28 volt batteries on

a tray, so you can lift them off and take them indoors on a cold Siberian night to keep them alive until morning. Scramble uphill to the cockpit and climb two more big steps to the pilots' seats; now your eyes are 13 feet off the ground. Strap in, lap-strap only, and of an old type ? male-female mate, then a throwover pin to secure. It's not so much a cockpit as a bridge. The wraparound glassware, the monstrous ironmongery and the ancient black-faced clocks put you in mind of those old pictures of Dr Hugo Eckener at his station aboard the Graf Zeppelin, manoeuvring that wonder of the age via speaking-tube. Worth a mention is the rear-view mirror on the pilot's side, "for warning of bird strikes on the trailing edges," Bill said. The two-horned, floor-mounted yokes stand on over-strength binnacles, and the instruments are laid out at random like salvage in a museum display. At top left are two fire warning lights. Fire is not taken lightly; there are nine detection points in the engine bay and a CO2 suppression system under a big red guard next to the warning lights. It's said that fire can consume an An-2 in 45 seconds, and at the very least you're certain to get a great gout of flame along the fuselage on start-up…

Next to these, a magneto switch and some gubbins for starting her up, then a long row of master switches… they've gone overboard here, because apart from the 'master' master there are toggle masters for sub-systems like individual electric trims, the electric flaps, cowl flaps, oil cooler flaps, fire extinguisher and so forth. You've also got the light switches up here, and there's a 'no smoking' sign switch; the pitot heat switch is guarded because apparently it draws a huge amount of power. The idea, Bill said, is to switch everything on unless you're specifically told not to. Next along there's a fantastic old Russian wireless, covered in Cyrillic ? it comes with a big box of spare crystals and valves. Moving to the top of the right side there's a clock and timer for the co-pilot, rev counter, OAT, airspeed, VSI in meters per minute and altimeter in metres, with the pressure setting in millimetres of mercury. (There's a conversion chart to millibars in the aircraft; 1013 mb runs out at 759 mm, if you're interested.)

Back on the left is a standard AH, DI (presented horizontally, E2B fashion), VSI, airspeed in kilometres per hour ? the numbers look normal until you make the conversion and realise that 60 is 32 knots ? and Ts and Ps. Cylinder head

temperatures from pots one and nine are presented Robinson helicopter-style on mirror needles, while a three-needle instrument at the bottom gives you oil temperature, oil pressure, and fuel pressure. On the centre console are five levers: the mixture, throttle, prop, carb heat and fuel cut-off. The ‘flaps down’ button falls to the thumb when holding the throttle; the ‘flaps up’ button is on the console below the mixture. Just ahead of the levers is the flap position indicator and an indicator for the oil cooler gills. Behind the levers you have the electric trim switches, with three green lights to tell you when they’re neutral. On the wall to the pilot’s left is the fuel management system, and all around are ventilation conduits. Ancient-looking fans occupy either side of the cockpit ? original Russian equipment, sorely needed on a sunny day. Overhead, the central glass panel can be pushed out for exit in an emergency. The rudder pedals are mounted on a pivoted girder and they travel over several feet ? you have to slide your heels back and forth, bending at the knee. On each yoke is a bicycle-type brake lever which operates pneumatic brakes according to which boot is advanced; the brakes are savage, and you can easily stand the plane on its nose inadvertently by overbraking on landing. Similarly, if you brake on rollout with one foot forward, you’ll groundloop in that direction.

But before you brake you have to move, which means starting ? and that’s a whole pantomime on its own. Let’s presume your masters and lights are on, you’ve done your checks, the mixture, throttle and prop are set and the chap on the ground has signified that there’s nobody standing under the prop. First you need fuel pressure, and that’s increased to 2.5 PSI by means of a long wobble pump lever at your right heel ? pump it like you’re kick-starting an old Norton 500. Prime with your left thumb, pumping with heel as the fuel pressure falls. When ready, pull out the loo-handle that activates the inertia starter and listen as the flywheel begins to spin up. The electrical draw on an ammeter will show about 12 amps, reducing slowly as the flywheel accelerates: after 25 seconds or so, when it reaches about six, push in the loo handle and flick the clutch switch immediately below it. There will be an almighty choking noise as the flywheel engages the engine and the prop begins to turn: after a few blades have passed, turn the magneto switch to ‘both’ with your left hand and say a little prayer while

juggling the throttle as required with your right.

Bill Leary has performed this dance many hundreds of times and hardly needs to think about it. Sometimes when she's neither hot nor cold the old cow refuses to co-operate, but on this occasion ? she'd been standing for a week ? KF caught, coughed, and fired first time. There's never been a noise like it. A dramatic, sensory-deprivation-inducing roar began to rise in her throat, a hurricane of oil smoke was dashed aside by the blurring blades and she shook herself into life. For the spectators it was a thrill; for the pilots, sitting with 1,000 horsepower in their laps, it was pure joy. We checked we weren't on fire, donned headsets (without which I think I'd be deaf now) and watched the CHTs come up. Revs up from 700 to 1,000 until the oil temp shifted itself, then Bill released the parking brake on the back of the yoke upright, unlocked the tailwheel with a panel-mounted switch and jockeyed the throttle, and that monstrous radial began to drag Popham past the window.

'Taxi' doesn't quite describe it; we lurched and lumbered like the bandaged monster that chases young ladies in the films, emerging from our own smoke hissing and spitting as Bill snatched at the brake handle and the air pressure shrieked in the pipes. Bill was working the rudder like a mad cathedral organist and I, trying to follow him through, could barely make sense of it. You had to push the side you wanted to turn into, grab the brake momentarily as many times as did the job, then bring the rudder back beyond neutral to stop the turn, braking as necessary, so you often found yourself turning right with left rudder and vice versa. Bill called up the A/G. "This is the Antonov," he pronounced, "taxying to the pumps. Beware wake turbulence."

"They'll be pleased to see you," said a small voice in the Tower. They were, too. "Five hundred a side please," said Bill as the ladders came out.

Afterwards Bill was a bit worried about starting when she was warm, but she caught first time and the cacophony was reprised as we trundled towards 26. The air intake sits atop the engine and gets in the way of what is already a poor view, so a bit of weaving is required and, I think, unpreventable. Pre take-off checks included cowl flaps and oil cooler gills fully open-air cooling is poor at these sorts

of speeds ? and the prop governor. Pull the prop all the way back and ensure that the governor prevents the engine from stalling and anything else from breaking. Flaps 15, and set the trims ? elevator down for three to five seconds, more if heavy, and rudder right for three seconds to counteract torque.

Now we're rolling, and the din at max revs is terrific. Within seconds the tail is up, largely of its own volition, and Bill is pummelling the rudder and jockeying the brake with tiny spits to cope with the slight crosswind on Popham's runway 26. The ASI comes alive rapidly, until you remember it's in kph; a quick mental calculation (multiply by 6 and divide by 10) shows that at an indicated 60 we're doing 36 mph, then subtract 15 percent for knots (divide by 100, multiply by 15 and take it away) but at this point you realise that the ground is going down as fast as it's going by. We left the runway in 150 metres at less than 40 knots, and climbing at around 90 kph indicated, Bill is progressively retracting flap, reducing throttle to 900 millimetres of mercury on the MAP gauge, and bringing the prop back to 2,100, which gives a shade under 200 metres per minute on the VSI. I'm about to work on some mental calculations in Russian when Bill says: "Okay ? you have control."

Hands on the aircraft and I feel a burst of elation: as a kid on the farm I used to drive an old Nuffield tractor with an extended steering column, and that's exactly what it was like, except we were in the air ? the long nose, the noise, the vibration, the feeling of power under your hand. The view all around was fabulous; only in front of you was almost everything obscured. We were climbing at between 90 and 100, the needle didn't seem entirely sure. (Multiply by…) I began to level off with 755 somethings on what looked like the altimeter and was surprised at how light the aircraft was in pitch: throttling back slightly reduced the racket and stilled the vibrations, and the ball quickly slid off-centre. The rudder, too, was surprisingly light ? the smallest application of boot produced a lively reaction in the ball, something Pilot's Editor, Philip Whiteman, who was sitting in the back, was moved to comment upon. Rudder work was constantly required, however, as the smallest power change wagged the tail. We agreed that Bill would retain control of the rudder trim, and Philip managed to survive the sortie with his breakfast intact.

Trimmed out straight and level we were ‘17 square’, which was 1700 RPM and 700 millimetres of mercury on the MAP, which happens to put 170 on the ASI ? that’s around 85 knots. The altimeter had us at 800, and frankly it was all pretty confusing, especially when you can’t remember which clock was which. So forget it all, look out of the window and fly the aircraft.

In a turn, the An-2 becomes a brute. Firstly, you have to lead with rudder (sorry, Philip) and getting that just right takes more practice than I was going to get. Then you begin to turn that monstrous yoke, and that’s where the muscle-power comes in. It just doesn’t want to go… you really have to heave her over, add a smidgeon of throttle and a tiny bit of back pressure, and hunt the air intake around the horizon. I thought it went well; I suspect from the outside it looked like an ungainly porpoise at play. I settled into a steep turn to the right, and Bill said: “Okay ? straight into a steep turn to the left.” Mother Machree! It felt like I was physically lifting the entire five-ton aircraft, hauling it through the vertical and throwing it over the side. In sharp contrast, the rudder went over easy and I ended up pedalling a bit to stay somewhere close to in balance. I hacked out a 360 and hauled her upright again, starting to sweat a bit.

“Now I will demonstrate a stall,” said Bill. Gently he pulled the stick all the way back, retarded the throttle and motored the trims. Speed, such as it was, decayed pretty rapidly, and KF began to wallow as the nose came up. The VSI showed an increasing sink rate, settling at around 500 metres a minute, and the leading edge slats popped out somewhere around 45 knots ? and that’s it. In the 20-knot wind, we would have looked from certain angles as though we were perfectly stationary. No breakaway, no drama, she simply sagged towards the ground under perfect control. (The Flight Manual makes no reference to stalling speed. Legend has it that if the engine fails in IMC or at night, you pull the yoke all the way back, keep the wings level and wait for the ground to arrive, which it will do at a rate which is survivable.)

Recovering from the stall, Bill pushed the throttle fully forward and the Annie leaped as 1,000 horsepower went to work. Unfortunately the drag curve rose up even faster and the acceleration was short-lived. He handed her back and I

trimmed the forces out ? ailerons, elevators, rudder ? as we flew back towards Popham, where we approached Runway 21 to give the spectators the benefit of her best side. On finals we dropped 40 of flap and watched the slats pop out, and I followed Bill through as he flared ever so slowly and ridiculously high, I thought. The Antonov settled gently in a perfect three pointer ? it's best not to meddle with wheelers because of her susceptibility to crosswinds and differential braking issues, I'm told. Landing roll was around 200 metres, then we turned off slowly with a jolting and hissing of brakes and rumbled down the crowd line. "Give them a wave," said Bill, so I did. "You'll be on YouTube by midnight," he said.

Shut-down is a lot easier than start-up ? park brake on, throttle to idle, fuel cut-off all the way back until everything goes buzzingly quiet, then mags off, cowl flaps and oil cooler gills closed, tailwheel locked and about a hundred switches to off.

The An-2 is not a difficult aircraft to fly, if you have the strength to turn it, and when you master the trims. It would be easier if you didn't have to figure out which clock you were looking at and what it was trying to tell you. The massive undercarriage is forgiving of poor landing technique, although the bounce is said to be proportional to the size of the crowd. And flying her puts a permanent grin on your face; the private pilots who come down to Popham to get some right-seat stick time on KF, maybe just taking a dozen mates to Old Sarum for afternoon tea, will know what I mean. They had planes like this in the friendly days before bureaucracy caught up with flying, when you went from A to B in your own time and without an equivalent weight of paperwork. Many things may be different now, but gratifyingly, some things will never change.

End