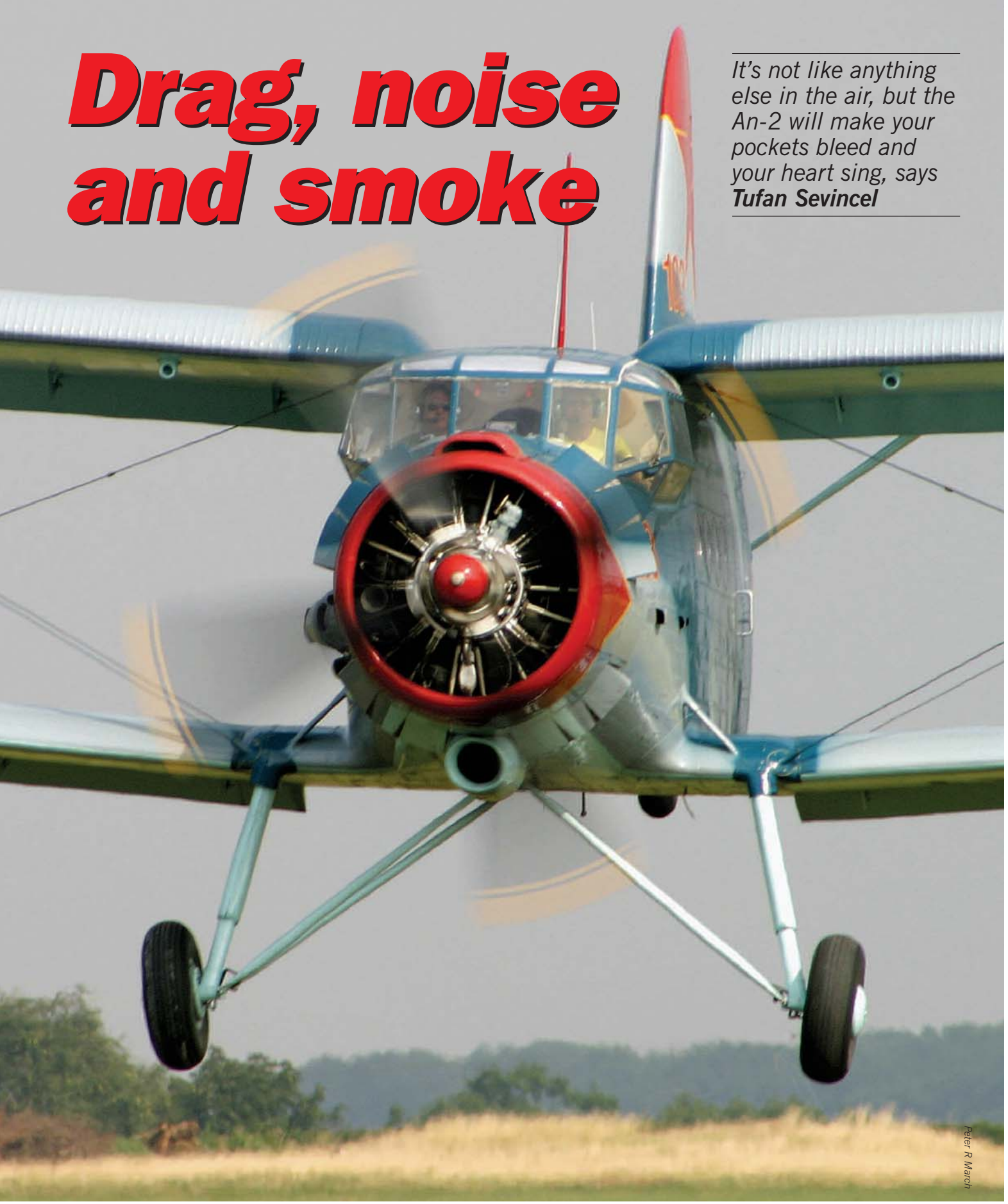
Drag, noise and smoke

It's not like anything else in the air, but the An-2 will make your pockets bleed and your heart sing, says ***Tufan Sevincel***



Peter R March

I didn't believe it, but it's true. You really can land an Antonov An-2 simply by pulling the yoke all the way back, cutting the engine and keeping the wings level. The descent rate will be parachute-like, the leading-edge slats will pop out at around 30 mph and the beast will meet the earth upright and with no damage. If you're ever caught out with an engine failure in hard IMC or at night, it's the technique that's recommended in the pilots' notes.

That's only one of the strange and wonderful facts about this fabulous old aircraft, the biggest single-engine biplane in the world, the living embodiment of drag married to brute horsepower and given wings to fly in the air. Only the Russians could have created the An-2, only the Russians could have kept it in production for half a century with very few modifications, and as an owner I can only say, thank heavens they did!

Nothing attracts attention like

Top: somewhere in northern Sweden, Tufan meets his new purchase
Above: Vladimir starts up the An-2 for the first time in two years
Left: the An-2 is a big beast – owner Tufan is a six-footer

'Anoushka', which is what the Russians generally call the Ant (although they have many names for all, almost all of the grudgingly complimentary). There are thousands of An-2s out there, and you can pick up a good one for the price of a family car. It will thereafter eat you out of house and home. A thousand litres of avgas is good for about 600 miles, and is uses oil the way a spamcan uses fuel. But if you have a rough strip smaller than a football field and you need to get twelve passengers somewhere not very quickly, you need Anoushka. You will fall in love with her and it will be painful, but you will not regret it.

How does a Turkish pilot living in the Home Counties of England come to own a Russian biplane he keeps in Lithuania and plans to fly to South Africa? I can explain. In 2000 I created what was to become the biggest online recruitment company in Turkey, employing 150 people, and in 2006 I sold it to the Americans, which gave me time and resources to devote to aviation. Flying was something I'd wanted to do since I was six years old, when I'd been given a ride in an L-19 artillery liaison aircraft. My father was in Army logistics in the Istanbul area; he didn't fly himself, but I can still remember the shapes of the clouds I saw on that flight and I've been chasing them ever since.

Rough, tough drag queen

Designed in 1946, the Antonov An-2 has changed little over the decades despite having had the longest production run of any aircraft bar the Lockheed C-130. It was still in production in Poland after the Wall came down and some 20,000 may have been made, in Russia, Poland and China. As a design, it was knocked up pretty quickly in response to the need for a bullet-proof bush plane that could carry passengers or freight, spray crops, fight fires, drop parachutists or whatever while operating unsupported from a few metres of rough turf. It is self-contained to the point where it can refuel itself from barrels using on-board power and pump up its own tyres and shock absorbers with a pneumatic connector on the underside.

The fuselage section was that of a DC-3, or rather, a license-built Li-2, cut down by about half, and engine is a Russian development of the nine-cylinder radial Wright R-1820 Cyclone. Called the Shvetsov Ash-62, it has been improved to the point where it pumps out 1,000 hp. And while it takes a lot of fuel to keep the beast burning – budget for 200 litres an hour and you won't be far out – it's all squandered on weight and drag. If she's making 100 kt in the cruise she's doing well, and downhill with a following wind she might attain 130 kt.

Dimensions

Length:	12.4 m (40 ft 8 in)
Wingspan:	
	Upper wing: 18.2 m (59 ft 8 in)
	Lower wing: 14.2 m (46 ft 9 in)
Height:	4.1 m (13 ft)
Empty weight:	3,300 kg (7,300 lb)
MAUW:	5,500 kg (12,000 lb)
Useful load:	2,140 kg (4,700 lb)

Performance

Max speed:	139 kt
Cruise:	100 kt
Stall:	26 kt
Range:	456 nm

I got my PPL in 2000 at the Istanbul Aviation Club at Sabiha Gokcen, Istanbul's second airport, which in those days had very little commercial traffic although it was a vast airport with 300 staff. The flying club, with its 17 members, represented virtually its only customers, and I can remember doing 13 touch-and-goes on that massive runway in a single circuit in a C152.

You may think that flying is difficult in Britain because of over-regulation and red tape. All I can say is that you wouldn't enjoy learning in Istanbul. There is a barely-concealed political antipathy to GA in Turkey, and every bureaucratic obstacle

will be put in your way. That said, I learned at a time when the Turkish authorities were going through a short-lived spasm of support for aviation, saying that Turkey was falling behind in the training of pilots; unfortunately it was a false dawn, but the positive side was that my training was free of charge.

With my PPL I began flying long distances in Turkey and Greece, then I got a CPL in order to learn more about aviation. I learned to fly the Beechcraft T-34 Mentor, eight of which had been passed to the flying club by the military. Unfortunately they were expensive to maintain, and they were eventually grounded because of wing spar cracking, but they were excellent advanced trainers and I enjoyed the 45 hours I flew in them.

In 2005 I bought my first aircraft, a new Cessna 172R. I wanted to fly across the Atlantic with the ferry pilot but my business was booming and I couldn't make the time. I sold the aircraft in 2006 and took an ATPL course with Atlasjet in Istanbul, together with a type rating on the Airbus A320. I did 100 hours on the 320 before deciding airline flying was not for me, and shortly afterwards I moved to England.

In 2009 I flew around the world in a Robin DR400 with fellow pilot Bill Hall in a 37-day tour organised by the FAI, during which I met a Russian pilot, Pavel Romanenko, who was looking to buy an aircraft. Pavel convinced me that I needed a classic plane with real character, and we looked at a Yak-52. But I thought something bigger, and much cheaper to buy, was more in my line. I'd seen many An-2s in the former Soviet Union; in fact, they say that if you have a couple of hundred dollars and you're in Kazakhstan you can buy a couple of hundred Antonovs – they are simply everywhere. I liked the idea of flying a single that carried 12 people and a ton of cargo, albeit not very fast.

Top right: welcome to the 1940s – random instrument placings and big handles
Right: vast prop and 1000 hp radial make cockpit life far from peaceful
Lower right: owner Tufan in the right seat on the ferry flight out of Sweden

Pavel and I knew that if we bought from Russia we'd have lots of permit problems, so we looked for one on a European register. Eventually we found a Lithuanian registered An-2, LY-AEX, at a very reasonable price – €25,000 – and bought it sight unseen. The trouble was that it was parked in a Swedish forest somewhere near the Arctic Circle, where it had been abandoned by a parachute club two years before. We took a high-time An-2 pilot, Vladimir Volokoslavsky, and an experienced mechanic who happened to be his son, and headed off into the middle of absolutely nowhere. On the way we spent the night in the car because it got stuck in the mud, and when we found the aircraft covered in tarpaulins Vladimir almost turned round and went home again. The long side of the clearing was 400 metres and there were tall trees at either end. But they soon established that AEX was in good condition – Polish-built in 1993, it had only flown 2,000 hours and had a new engine. We got it up and running quite quickly, and of course Vladimir was able to lift it out of the clearing with ample room to spare.

I thought it was running well, but Vladimir and his son thought it was using too much oil, So he set it back down on the strip, and the two of them dismantled much of the engine in awful conditions – four degrees and raining – traced the trouble to a leaking gasket and fixed it. Then we took off again and flew five hours to Lithuania, at 200 feet over the sea.

In Kaunas there's a big maintenance centre for the An-2, where they have a lot of massive hangars and a tiny grass strip for the aircraft to come and go. Hangarage is cheap – we pay about $100 a month. They're working on small modifications to AEX because of the trip I'm planning to Cape Town next year.

Flying the An-2 is not like flying any other aircraft I know. The main impressions are of the size, the noise – you've got 1,000 hp in your lap, and without headphones you'd be in big trouble – and the muscle-power you need to wrestle the plane through the air. The controls are not boosted, and the word "heavy" doesn't quite cover it. It comes down like a five-ton truck. Once the

Top left: the An-2 is at home on grass – some have never seen tarmac
Left: the door may remain open in flight without affecting the flying characteristics
Lower left: Tufan has fitted an exhaust extension to reduce noise and prevent fuselage streaking

wheels touch you have to be extraordinarily sensitive with the brakes because you can stand it on its nose in no time. On the ground, you can only move under engine power; I've tried pushing it with six other guys, and we couldn't.

I did my training last year in the Ukraine, at the Army Aviation School near Kiev. It was an interesting experience, partly because they didn't speak any language I know. Pavel Romanenko translated for me, but he's a Russian and they don't really understand Ukrainian anyway, so I started learning some Ukrainian – left, right, circuits, words like that. Our instructor had 20,000 hours and had flown the An-2 in Afghanistan, and we were the only two students in the school; they closed it down after we left. The course was 15 hours, and all the flying was done from a short, rough grass strip. It was a lot of fun.

It's not the Russian way to do a walk-round. They look at it from a distance, and if there's nothing missing, they fly. Sometimes all they do is walk the prop through fourteen or fifteen blades – very heavy work for two men – to clear any oil lock in the lower cylinders, then jump in. I had printed all the checklists and got them out as I settled into the left seat; the instructor snatched them out of my hand and threw them in the back. The attitude was that you're learning to fly the aircraft, not the checklist… everything you need should be in your head. I've come round to that way of thinking, but there were some interesting items on the checklist – removing the can that collects the oil dripping constantly from the engine, and checking the escape manhole in the cabin floor is secure.

The cockpit is very agricultural. There's a lot of light and visibility is great, with wraparound windows stretching far behind you and over your head. The yokes are massive and mounted on the floor. There's a bicycle-type brake lever on the left one, and you steer by differential braking; left pressure on the rudder bar – or rudder girder – and a squeeze of the lever turns you left. You really have to be careful when you're stopping because the pneumatic brakes are very powerful and you'll find the prop chewing the ground before you know it. A notable feature is the two rudimentary fans for improving pilot cooling; you might laugh, but I've been in the cockpit of the giant An-225 and they've got exactly the same.

There are endless toggle switches and instruments apparently thrown into the panel at random, and in the centre is a big console with an array of levers – the throttle, the mixture, the fuel master, the prop, and at the back, a series of switches for all the electric trims. You really need these. There's a rudder trim you don't use much, and elevator and aileron trims you use all the time. With such heavy controls, it's vital that you keep the aircraft balanced, and in fact it's quite easy to trim out so you can fly hands-off. There are three green lights on the console to show when you're perfectly in trim. But then your friends in the back start to walk up and down, and think it's funny…

A word about the flaps – they're electrically-driven and massive, and given the amount of drag built into an An-2, adding 40 degrees of flap would seem to be gilding the lily. But along with the leading edge slats they allow truly extraordinary short field landings. There are flaps on both mainplanes, full span on the lower and half span on the upper, and extending them means pushing a button on the throttle lever; retraction is via a second button on the console. There's a flap position gauge on the centre console but it seems to have only a passing acquaintance with where the flaps actually happen to be; however, the flap motors are so noisy that you can easily hear them working, even above the din of the engine.

The six fuel tanks are in the top wing and there are two ways of filling them; one, climb up the fuselage using the kick-ins and hoist up the fuel nozzle with a rope, or two, plug a pipe underneath the aircraft into a barrel and use the plane's internal power to suck up the fuel. The An-2 was designed to be self-contained. One man can refuel it without help in the field, and there's a pneumatic connector on the underside with which you can pump up the tyres. The two 28-volt batteries slide out on a tray, so you can remove them in seconds and carry them into your yurt to keep them warm during the night. All very well thought-out.

The fuel selector is on the pilot's left side, down on the cockpit wall where the co-pilot can't reach it. While there are six tanks, there are only four positions – left, right, both and off – and you usually have it either on off or both. The fuel gravity-feeds to the engine. There's a plunger-style primer and you give her about six good squirts, more if you're flying in winter, much more if you're flying in Siberia in winter.

Prop is forward, mixture control backward (full rich) fuel master lever is forward (open), carb heat is off, oil cooler and cowl flaps (they're electric) closed and you're ready to go. There's an inertia starter with a master switch at the top of the panel on the left side. Flicking it powers up the flywheel, then you pull out a clutch handle to engage the engine while at the same time turning the magnetos to 'both' and pumping the throttle. She usually starts quite easily, and it's very impressive to see from the outside, with whipping clouds of grey smoke from the oil in the cylinders, and lots of noise. I'm

having an extension put on AEX so it exhausts under the lower wing, partly to reduce the noise, but also to remove the oil and smoke streaks that tend to repaint the fuselage on every flight.

At this point the Russians tend to be very concerned about fire. They reckon it takes about 45 seconds to consume a freshly-fuelled An-2, and starting can produce impressive gouts of flame and fire back into the carburettor. There are two fire warning lights and a big red extinguisher button on the panel, and a Russian hand will hover near it while the engine coughs and snorts into life.

Assuming you're not on fire, set the throttle for a 1200 RPM warm-up and your attention could wander to the cylinder head temperatures. These hold magnetic interest to the pilot throughout the flight. 1,000 horsepower travelling not very fast through the air calls for judicious use of cowl and oil cooler flaps at all times. The power checks are done quickly because of cooling issues and are pretty standard; just remember to exercise the prop two or three times in cold weather. Pre-take-off checks are what you'd expect, with cowl flaps open and flaps set to 15 degrees, but you do need to motor the rudder and elevator trims to help counter the torque on take-off – elevator nose down and rudder a couple of seconds to the right.

Advance the throttle, and the An-2 lifts of after a ridiculously short run, a hundred metres if you're light, then climbs like a lift. It leaves the ground at less than 50 kt, and you want to get the flaps in before it reaches 75 kt. Surprisingly little elevator trim change is required as they slowly retract. Keep an eye on the CHTs and moderate the rate of climb if necessary. Level off when you're ready – there's no point wasting time getting to altitude, low flying is what the An-2 is about – and nurse the trims back to three greens. You won't notice a burst of acceleration as you level off.

Everything happens in slow motion, especially aileron response. You must lead with rudder, heaving your leg on the girder before hauling two-fisted on the yoke. The ball is surprisingly lively and given the control forces it's hard to nail it at first, but as with everything else, a bit of practice and some judicious trimming does the job. Holding a steep bank calls for a good deal of musclepower on top rudder.

I've tried to stall her and she just won't. Raise the nose and idle the engine and the drag will wash the speed off pretty quickly, but she mushes back ever more slowly until, with the yoke fully back, the slats pop out, the nose goes to the horizontal and she begins to descend with all the grace of an elephant. If you keep the wings level she'll approach the planet in a three-point attitude at something under 30 mph and maybe 600 feet a minute, and that industrial undercarriage just eats up forces

like that. I was a little surprised when she flounced down onto the ground, largely because you're a long way up in that cockpit and I wasn't expecting it

Don't try it in a crosswind. The big fin and the slab-sides make the Ant very susceptible to side winds, and even experienced pilots don't like landing other than with the wind on the nose, and they prefer three-pointers to wheelers because of potential crosswind effects. Given the short landing roll, it should be possible to land close to the wind every time, even if it means landing across the runway. Just remember not to be too enthusiastic with the brakes. In fact, it's best to stay away from them altogether. Remember, they're differential brakes, so if you touch the brake handle when you've got, say, a bit of left rudder in, the left wheel will stop and you'll groundloop. For normal landings, approach at 60 to 65 kt and bear in mind just how high up the cockpit is when judging the flare. Sometimes you'll get the slats popping out in the flare, but you have to be down to about 25 mph to make it happen.

If you need an SEP with an on-board toilet, if you've got muscles like Popeye and you're happy to take six hours to fly 600 nm, and if you want a piece of low-tech aviation history that won't break the bank until it's hopelessly fixed in your affections, then Anoushka is for you. Fill her up, throw away the checklist and fly like the Russians do; she'll carry you back to 1947 and it's a great place to be.

Top: wraparound windows provide fabulous views of a slow-moving planet
Above right: porthole windows provide an unusual view of the world
Right: fire risk – it's reckoned that an An-2 can burn out in 45 seconds
Below: If you keep the wings level she'll approach the planet in a three-point attitude at something under 30 mph

Keith Wilson