TATS BULLETIN

FIRST EDITION !

Top Aviation news and insights...!

theaviatortraining.com

20/08/2025

THE UNIVERSAL BLUEPRINT

How Ground School Creates Safe Pilots

Capt. Sujith Subhash

Ground school lays the foundation for every pilot, equipping them with the knowledge to navigate the skies safely and confidently. At Aviator Training School, our curriculum spans seven critical disciplines that form a universal blueprint for aviation—applicable worldwide and ensuring pilots operate under international standards.

METEOROLOGY: MASTERING THE SKY'S MOODS

Weather influences every flight decision. Our pilots learn to decode complex weather reports like "METAR 121650Z 27010KT 9000 FEW030 25/20 Q1013" and identify hazards from thunderstorms to icing conditions. Through simulators and case studies, students develop the judgment to navigate around squall lines and adapt to rapidly changing conditions.

REGULATIONS: THE GLOBAL FRAMEWORK

International standards set by ICAO create consistency across borders. Students learn why English is mandated for air traffic communication worldwide and how regulations determine everything from minimum fuel reserves to obstacle clearance requirements. Scenario-based training builds the disciplined mindset essential for flight safety.

NAVIGATION: PRECISION PATHFINDING

From following visual landmarks (pilotage) to operating sophisticated GPS systems, pilots master multiple navigation techniques. This versatility ensures they can find their way even when primary systems fail. One graduate successfully navigated home using only pilotage after a complete GPS failure—preparation that potentially saved lives.

AIRCRAFT SYSTEMS: UNDERSTANDING THE MACHINE

Modern pilots are part aviator, part technician. They must understand engines, avionics, and instruments to identify and respond to malfunctions. Using virtual cockpits, students learn how a blocked pitot tube can create misleading airspeed readings and how proper pre-flight checks can prevent in-flight emergencies.

AERODYNAMICS: THE PHYSICS OF FLIGHT

The delicate balance between lift, weight, thrust, and drag determines an aircraft's performance. Students use models and simulators to explore how wing flaps increase lift for takeoff and how excessive angles of attack can trigger dangerous stalls. This knowledge optimizes performance while maintaining safety margins.

HUMAN FACTORS: THE PILOT WITHIN

Modern pilots are part aviator, part technician. They must understand engines, avionics, and instruments to identify and respond to malfunctions. Using virtual cockpits, students learn how a blocked pitot tube can create misleading airspeed readings and how proper pre-flight checks can prevent in-flight emergencies.

FLIGHT OPERATIONS: THE INTEGRATED APPROACH

Here is where everything connects. A pilot planning a cross-country flight considers weather patterns, airspace regulations, navigation options, system limitations, aerodynamic performance, personal fatigue levels, and emergency alternatives. Our simulator sessions challenge students to handle complex scenarios that require drawing on all seven disciplines simultaneously.

At The Aviator Training School, we make this comprehensive curriculum engaging through interactive technologies, relatable analogies, and real-world stories. Our supportive environment encourages questions and builds confidence, even when tackling challenging concepts.

This universal blueprint prepares pilots to fly anywhere in the world with precision and confidence. To aspiring aviators, we offer this advice: embrace each subject as part of an integrated whole, connect their lessons in everyday flying, and you'll be prepared for whatever the skies may bring.

Ground school's subjects—meteorology, regulations, navigation, aircraft systems, aerodynamics, human factors, and flight operations—form a universal blueprint for safe aviation. At The Aviator Training School, we teach these as an integrated whole, preparing pilots to fly anywhere in the world. To aspiring aviators, I say: embrace each subject, connect their lessons, and fly with precision. This blueprint will guide you through every sky, safely and confidently.

The Legendary Duo:

SERGEY BOGDAN AND THE SU-57

Pushing the Limits: The Su-57 and Its Legendary Pilot

Jishnu Lal

In February 2025, the Sukhoi Su-57, Russia's fifth-generation stealth fighter, captivated audiences at Aero India, piloted by Sergey Bogdan, Sukhoi's chief test pilot and a Hero of Russia.

Bogdan's jaw-dropping maneuvers -executing a 120° angle of attack and Pugachev's Cobra-showcased the Su-57's agility and his unmatched skill, cementing his status as a legend in military aviation.This is the story of Bogdan and the Su-57, a duo transforming aerial warfare and inspiring many aviators.

Born on March 27, 1962, in Volsk, Russia, Sergey Bogdan's journey feels like it was written in the stars. He graduated with honors from Borisoglebsk Higher Military Aviation School in 1983, then flew Su-17 fighters in the Leningrad Military District and Mongolia.

In 2000, he joined Sukhoi, becoming their top test pilot with thousands of hours on over 50 aircraft, from MiG-29s to Su-35s.

His big moment came on January 29, 2010, when he flew the T-50 (the Su-57's prototype) for its first 47-minute test, a leap that put Russia in the fifth-generation fighter game.

Bogdan's grit shaped the Su-57 into a masterpiece. He logged hundreds of test flights, pushing it through gut-wrenching high-G turns and heart-stopping stalls.

The Su-57 Felon Stuns at Aero India 2025

At Aero India 2025, Bogdan showed off the Su-57's magic—its engines twisting like a dancer to pivot mid-air, nearly pausing as if defying gravity. Those moves, praised across X, proved it can outmaneuver rivals like the F-22 Raptor.

The Su-57, nicknamed Felon by NATO, is a tech marvel. Its twin Saturn AL-41F1 engines hit Mach 2 (2,470 km/h) and cruise supersonically without afterburners, saving fuel for dogfights. Stealth materials hide it from radar, while advanced sensors give pilots a full view of the battlefield, like having eyes in the back of your head.

It carries missiles like the Kh-59MK2 in internal bays, ready for any mission. Bogdan's Aero India display, with moves like the Cobra, showed why its agility is a game-changer for evading threats.

Bogdan trains pilots worldwide, sharing lessons from his wild test flights. “Test pilots take risks so others can soar,” he’s said. Russia’s pitch to co-build Su-57s with countries like India, despite hurdles like sanctions, shows its global potential, all thanks to Bogdan’s pioneering work.

Conclusion

In the end, Sergey Bogdan and the Su-57 are a duo that I always inspire . His daring flights and the jet’s cutting-edge tech are setting new standards for air combat. For students like us Bogdan’s legacy is a call to chase the skies, proving that with grit and skill, we can fly higher than we ever imagined.

JET OR CLOUDS? SEPARATING FACT FROM FICTION

Shahana S A

The Fascinating Cloud Mistaken for Jets

Have you ever gazed up at the sky and spotted what you thought was a jet flying high, only to realize it was just a cloud? You're not alone. As a cadet pilot, I'm constantly learning about the wonders of aviation. One phenomenon that caught my attention is contrails - those cloud-like trails that can be mistaken for jets. In this article, I'll explore what contrails are, why they form, and how they differ from clouds. Let's take to the skies and uncover the mystery!

What are contrails?

Contrails, short for condensation trails, are cloud-like formations that can often be mistaken for jets. Contrails are clouds that form when the hot exhaust gases from an airplane's engines mix with the cold air in the atmosphere. This mixture causes the water vapour in the exhaust to condense into tiny droplets, creating a trail of cloud behind the plane. Contrails can appear as thin, wispy lines or thicker, more billowy clouds, depending on the atmospheric conditions.

How do contrails form?

Contrails form when the air is cold enough for the water vapor in the exhaust to condense into droplets. This typically occurs at high altitudes, around 25,000 to 40,000 feet, where the air is colder. The formation of contrails also depends on the humidity of the air. If the air is too dry, contrails won't form. But if the air is humid enough, contrails can persist for several minutes or even hours.

.

Why are contrails mistaken for jets?

Contrails can be mistaken for jets because they can appear to move across the sky, just like a plane. However, contrails are actually stationary clouds that can persist for a long time after the plane has passed. When the sun catches a contrail at the right angle, it can create a bright, shiny appearance that can be mistaken for the reflection off a plane's surface.

Distinguishing contrails from jets

So, how can you tell if what you're seeing is a contrail or a jet? Here are a few tips:

- Contrails tend to be longer and more persistent than the trail of a jet.
- Contrails often appear as thin, wispy lines or thicker clouds, while jets appear as small, moving dots.
- If you're unsure, watch the "jet" for a few minutes. If it's stationary and doesn't move, it's likely a contrail.

The impact of contrails

Contrails may seem like a harmless phenomenon, but they can actually have an impact on the environment. Contrails can trap heat in the atmosphere, contributing to climate change. Additionally, contrails can also affect local weather patterns, influencing cloud formation and precipitation.

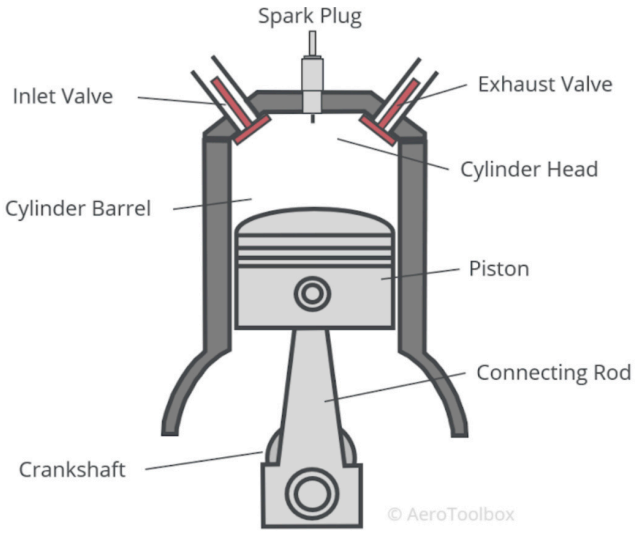
Conclusion

Contrails are fascinating cloud formations that can often be mistaken for jets. By understanding how contrails form and behave, we can better appreciate the complex interactions between airplanes, atmosphere, and climate. So next time you spot what you think is a jet in the sky, take a closer look – it might just be a contrail!

PISTON ENGINES STILL POWERING THE SKIES

Shreya Bimal

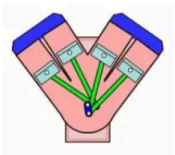
A Legacy in Aviation



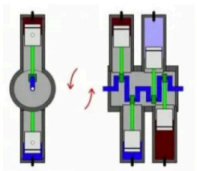
Piston engines, also known as reciprocating engines, have played a crucial role in the history and development of aviation. They are internal combustion engines that use one or more reciprocating pistons to convert pressure into a rotating motion. These engines are typically used in small aircraft due to their simplicity, reliability, and lower cost compared to turbine engines. Piston engines helped pioneer early aviation and remain integral to flight training and personal aviation.

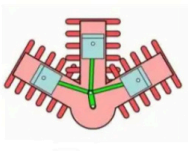
Types That Defined Decad

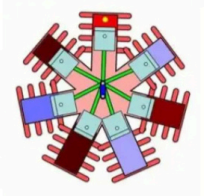

Inline Vertical Engine


V-Type Engine


Horizontal Engine


Opposed Cylinder Engine


W-Type Engine

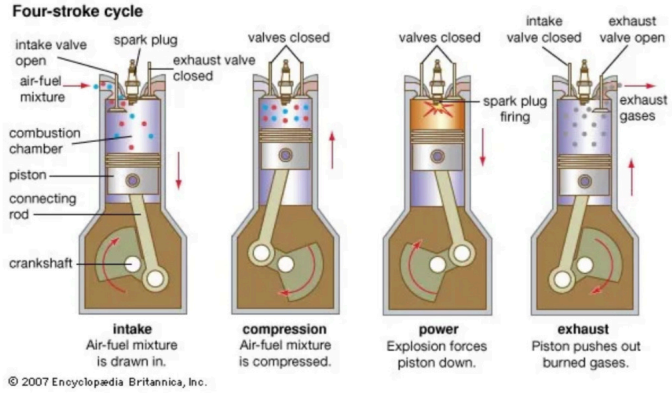

Radial Engine

Types of Piston Engines

1. **Inline Engine**: Cylinders are arranged in a straight line. Offers low drag but can be long and heavy. 2. V-Type Engine: Cylinders arranged in a V-shape. Compact and more balanced.

3. **Radial Engine**: Cylinders arranged in a circle around the crankcase. Known for reliability and used in many WWII aircraft.
4.**Boxer Engine**: Also known as flat engines; cylinders are arranged horizontally in pairs. Common in general aviation.
Each of these types has design trade-offs in terms of cooling, weight distribution, and maintenance complexity.

How It All Works



Working Principle

Piston engines operate on the four-stroke cycle: intake, compression, power, and exhaust. During the intake stroke, the piston moves down, drawing in a mixture of air and fuel. On the compression stroke, the piston moves back up, compressing the mixture. Then, a spark ignites the compressed mixture, causing an explosion that drives the piston down (power stroke). Finally, the piston moves up again to expel exhaust gases (exhaust stroke). This cycle repeats to generate power.

Pros and Pitfalls

Advantages:
- Simple design and relatively easy maintenance - Lower initial and operational costs compared to turbine engines.
- Ideal for short-distance flights and low-to-medium altitude operations.
- Abundant availability of parts and maintenance expertise.

Disadvantages:
- Lower power-to-weight ratio compared to turbine engines.
- Performance declines at higher altitudes - More mechanical components, which increases chances of wear and tear.
- Noise and vibration can be more pronounced.

Everyday Aircraft Applications

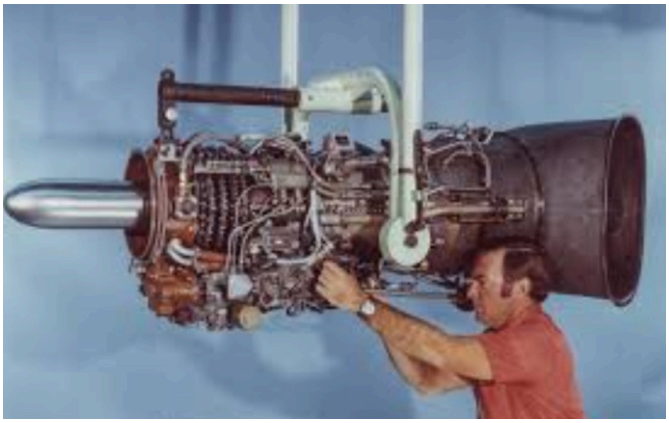
Applications:
Piston engines are widely used in general aviation. They power a variety of aircraft including:
- Light sport aircraft
- Single and twin-engine trainers
- Agricultural aircraft used for crop dusting
- Small cargo and mail planes
- Vintage and historic aircraft restorations

Their versatility, combined with ease of operation and repair, make them ideal for aviation enthusiasts, flight schools, and rural or remote operations.

Looking to the Future

Future Trends:
Despite the growing popularity of electric propulsion and hybrid systems, piston engines continue to evolve. Innovations include improved fuel injection systems, electronic ignition, and the use of alternative fuels like unleaded avgas and biofuels. These developments aim to reduce environmental impact and improve efficiency while maintaining the reliability that piston engines are known for.

A Journey Through Time



Historical Development:

The development of piston engines dates back to the early 20th century, with the Wright brothers using a basic four-cylinder engine for their first flight in 1903.As aviation advanced, so did engine design. Radial engines dominated during World War I and World War II due to their robustness and simplicity. In the post-war era, flat and horizontally opposed engines became more common in general aviation thanks to their compact design and improved aerodynamics.

Keeping The Engine Airborne

Maintenance and Reliability:
Piston engines require regular maintenance to ensure reliability and safety.

This includes oil changes, spark plug inspections, magneto timing checks, and compression tests. The relatively simple mechanical structure makes them easier to service compared to turbine engines. Despite requiring more frequent attention, piston engines can remain operational for decades when properly maintained.

Next-Gen Powerplants

Emerging Technologies:
Innovations in piston engine design are focused on improving fuel efficiency, reducing emissions, and integrating with modern avionics. Electronic fuel injection, full authority digital engine control (FADEC), and hybrid-electric systems are gaining traction. There is also growing interest in using alternative fuels, such as biofuels and synthetic AVGAS, to make piston-powered flight more sustainable.

WORLD'S SMALLEST AIRPORT TERMINAL

Elaine Selix

THE **ANGAUR AIRSTRIP IN PALAU** HAS the world's smallest airport terminal.
It's an open-air structure, smaller than a bedroom , with minimal amenities like a bench and a baggage loading area.There are no walls, bathrooms,or electricity.
It's a unique and charming example of a tiny airport terminal.

Location & Background

- Angaur Island, part of the Republic of Palau in the western Pacific Ocean.
- Angaur is a very small island (only about 8 km²) with a population of under 150 people.
- The airstrip provides essential air connectivity for locals and visitors.

Features of the Terminal

- Structure: Just a simple open-air shelter, smaller than a bedroom.
- Facilities: A bench, a roof for shade, and a small baggage loading area.
- No walls, bathrooms, or electricity – extremely minimal.
- Runway: A grass runway suitable for small propeller aircraft.

Function & Usage

- Primary role: Acts as a pit stop for short island-hopping flights in Palau.
- Planes serving the airstrip are small, usually twin-engine turboprops like the Britten-Norman Islander.
- It's mainly used for local transport, medical evacuation flights, and cargo deliveries.

BREAKTHROUGH IN ELECTRIC AVIATION: 90-PASSENGER BATTERY-POWERED AIRCRAFT ANNOUNCED

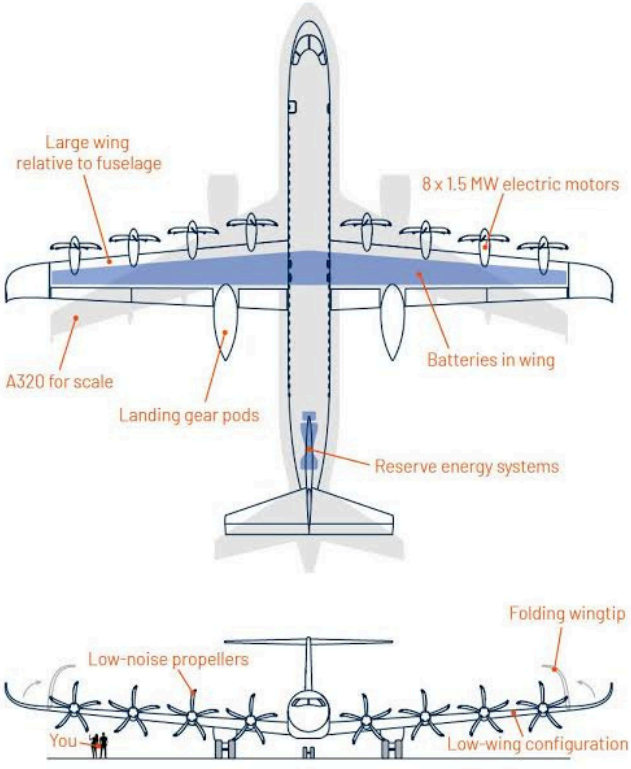
Muhammed Nassim

In a landmark moment for sustainable aviation, **aerospace startup **Elysian and Delft University** of Technology have unveiled a breakthrough in electric aircraft design. New research presented at the 2024 AIAA SciTech Forum revealed the feasibility of building a 90-passenger battery-electric aircraft capable of flying up to 800km—far surpassing previous expectations for electric flight.

The Science Behind the Breakthrough

Researchers achieved this milestone by increasing battery energy density to 360 Wh/kg, making it possible for larger commercial planes to fly regional routes entirely on electric power. This addresses the long-standing challenge that battery weight and energy limitations restricted electric aviation to only very small, short-range planes.

-**Larger scale**: The proposed plane could carry 90 passengers.
- **Longer range**: Capable of a journey up to 800km (roughly the distance from New York City to Chicago).
- **Commercial potential**: Covers 50% of existing global flight routes, which are responsible for a significant share of aviation's CO_2 emissions.



The Industry Impact

Elysian aims to have this aircraft operational by 2033. The announcement marks a paradigm shift—electric flying is no longer just for small, experimental planes, but could soon serve mainstream regional travel.
Researchers say this design can deliver five times higher energy efficiency per passenger kilometre compared to hydrogen- or Sustainable Aviation Fuel-powered aircraft. The team estimates it would be as energy-efficient for each passenger as a typical electric car.

Why This Matters

This breakthrough could dramatically reduce aviation's environmental impact, especially on short-haul routes. Electric planes produce zero direct emissions and much less noise, promising cleaner, quieter skies for the future.
Governments across Europe and North America are now accelerating certification and infrastructure updates to accommodate this next wave of green aviation, with the Netherlands already charting a roadmap for commercial electric flights by 2026.

This story captures how science and innovation are turning one of aviation's biggest dreams—clean, affordable, electric-powered flight—into a soon-to-be reality.

20 August .2025

CONCORDE:THE SUPERSONIC LEGEND REVISITED

Aiswarya Antony M A

Origins & Legacy

Born from a bold 1962 Anglo-French pact, the Concorde took to the skies in 1969 and entered service in 1976.Of the 20 built, 14 served paying passengers via British Airways and Air France. Today, multiple preserved Concordes stand as cultural icons in major museums worldwide .

Power, Performance & Supersonic Life

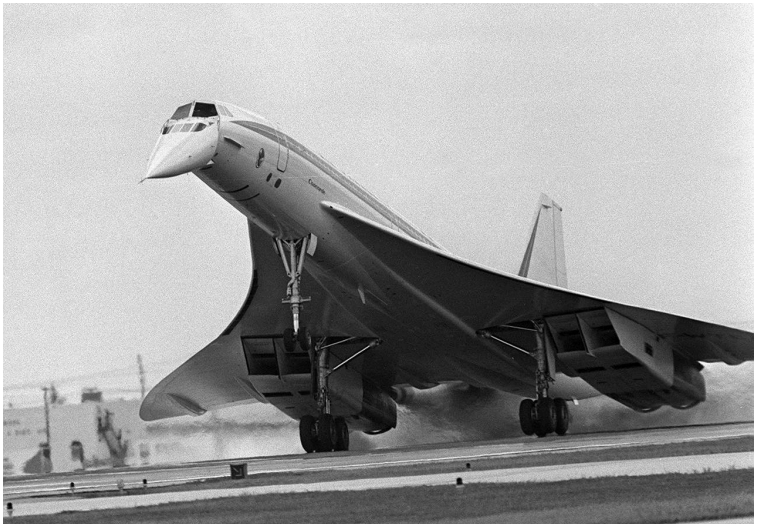
Equipped with four Rolls-Royce/Snema Olympus 593 turbojet engines, each delivering ~38,000 lb of thrust, Concorde achieved M a c h (~1,350 mph) and 60,000 ft altitude. It famously flew London-New York in just under 3.5 hours-once even in under 2 hours 53 minutes .

What made a journey on Concorde so special?

Flying faster than the rotation of the earth, Concorde could pick up passengers from London at breakfast time and transport them to New York well before breakfast US time – the same day! Sir David Frost once described Concorde as 'the only way you can, in human life, be in two places at once'.

More than 2.5 million passengers have flown supersonically on Concorde since 1976. Each passenger was issued with a certificate to prove that they'd broken the sound barrier.

As the plane gathered speed, those on board could watch the Mach meter at the front of the cabin. The Mach meter measured speed not in miles per hour but in units of 'speed of sound'. Mach 1 is exactly the speed of sound; Mach 2 is twice the speed of sound.



Cabin Interior & Passenger Experience

Despite a narrow cabin - with 16in aisle, 17in seats, and tiny 4.in windows-Concorde offered a luxurious setting. Elite flyers enjoyed gourmet dining and champagne at supersonic altitude.

In the 1990s, designer Andrée Putman reimagined the interior with lighter furniture and ambient lighting to expand the feeling of space within the confines of a slender fuselage.

Sidebar trivia: Blue LED ceiling lights glowed across the cabin at Mach break to subtly cue passengers to the supersonic milestone.

The dream becomes a nightmare

On 25 July 2000, the Concorde dream became a nightmare. An Air France Concorde crashed shortly after take-off at Charles de Gaulle airport in Paris. One hundred passengers, nine crew and four people on the ground were killed. The Concorde fleet of Air France and British Airways were subsequently grounded, but not before Alpha Alpha made what was to be her final flight, from JFK New York to London Heathrow on Saturday 12 August 2000.

In 2001, Concorde was back after a £17m revamp, but Alpha Alpha was not selected for upgrade. But British Airways and Air France could not have foreseen the events of 11 September and the slump in worldwide air travel. Empty seats meant only one thing: Concorde had reached the end of the road.

A graceful retirement

On 10 April 2003, British Airways announced that it was reing its fleet of seven Concordes. A farewell tour of the UK and North America commenced, with tens of thousands of fans saying their goodbyes to the iconic aircraft.

The decommissioned aircraft have gone on public display at museums around the world. G-BOAA (Golf-Bravo Oscar Alpha Alpha) takes pride of place at the National Museum of Flight in East Fortune.

Concorde's Peculiarities Summary

Peculiarity Impact & Detail

- Mach 2 cruise Earth curvature visible at **60,000 ft**
- Droop nose + visor Low-speed visibility combined with supersonic efficiency.
- Compact cockpit space A cockpit packed with instruments and crew-stations.
- Fuel-centre balancing Dynamic fuel shifts served as trim control.
- Blue LED Mach 1 cue Subtle cabin lighting to mark transition to Supersonic speed.

🔧 **Challenges of Supersonic**

• Noise Regulations: Sonic booms restrict overland supersonic travel (still banned in the U.S. and many countries).

• Fuel Efficiency: Supersonic jets consume 3–5× more fuel per passenger/km than subsonic.

•Environmental-Impact:High-altitude emissions and fuel burn raise sustainability concerns.

•Cost & Accessibility: Very high ticket prices—likely limited to premium passengers or government use.

THE FUTURE OF FLIGHT: ELECTRIC AIRCRAFT ARE TAKING OFF

20 August . 2025

Jyothis Shibu

The way we fly is about to change. With rising concerns about climate change and a strong push to cut carbon emissions, the aviation industry is looking to the skies for cleaner, smarter alternatives. And electric aircraft are quickly becoming a promising solution.

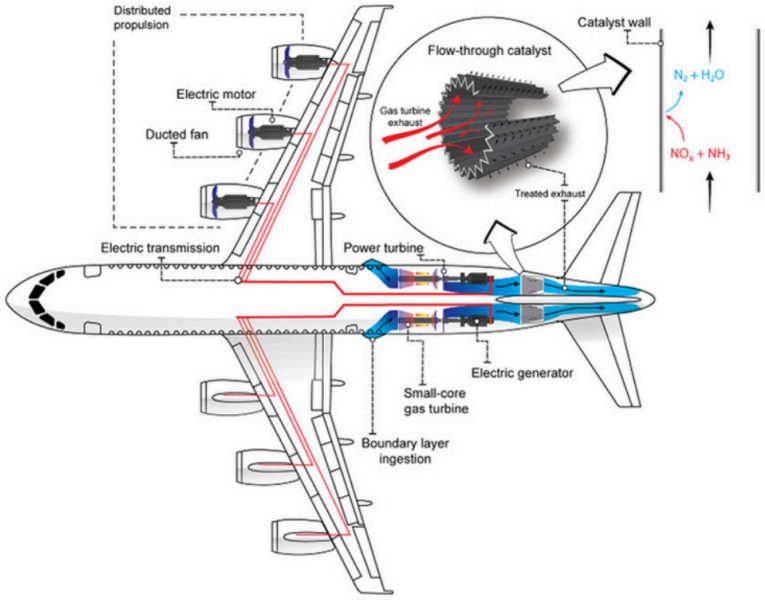
One of the standout names in this space is Eviation Aircraft, which has already flown its all-electric plane, Alice. Designed for short regional trips, Alice can carry nine passengers and travel up to 400 kilometers on a single charge. It's quiet, efficient, and if all goes to plan could enter service by 2027. That's not science fiction anymore; it's just around the corner.

Meanwhile, big players like Airbus and Rolls-Royce aren't sitting still. They're investing in next-gen tech like hybrid-electric and even hydrogen-powered planes. Airbus, for example, has its eyes set on launching a zero-emission commercial aircraft by 2035 under its ambitious ZEROeprogram.

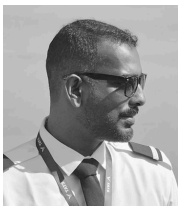
Of course, there are still some bumps in the runway. Batteries need to get better to support longer flights, and aviation regulations have to catch up with this new tech. But progress is happening fast.

With governments backing green initiatives and innovation moving at full speed, electric aircraft are no longer a far-off dream. They're the future and that future is taking flight

But electric aircraft aren't just about cutting emissions. They're also expected to be cheaper to operate, easier to maintain, and much quieter which could make flights more pleasant for passengers and nearby communities. Plus, their ability to use smaller runways means more direct routes to rural and regional destinations.



THE FUN AND FACTS OF BUSH FLYING



Jebin Georgy Koshy

There's a certain magic in the moment when a small airplane lifts off from a dirt strip, a gravel bar, or even the glassy surface of a lake. This is bush flying—aviation stripped down to its raw, adventurous core. Far from the busy runways of big cities, bush pilots fly where few others dare to go, connecting remote communities and exploring landscapes that seem untouched by time.

The Thrill of Bush Flying

Every flight is an adventure. One day, a pilot might be navigating narrow valleys in Alaska; the next, dropping supplies to a mining camp in the Canadian tundra or landing on a sandbar in Africa. Unlike airline flying, bush pilots don't just press buttons and watch autopilot do the work. They rely on skill, instinct, and a deep respect for the wilderness.

Passengers never forget their first bush flight. The roar of the engine, the short takeoff run, and the breathtaking views of mountains, rivers, and wildlife—it feels less like transportation and more like stepping into an explorer's storybook.

Fun Facts About Bush Flying

• **STOL Aircraft**: Many bush planes are masters of "Short Takeoff and Landing." A well-handled Piper Super Cub can leap off the ground in less than 200 feet.

• **Adaptable Gear**: Huge tundra tires, floats, and skis let these airplanes touch down almost anywhere—be it a frozen lake, a forest clearing, or a sandy beach.

• **Essential Service**: In places like Alaska, Papua New Guinea, and parts of Africa, bush planes aren't just for fun—they deliver food, medicine, and even help transport sick or injured people to hospitals.

•**Cargo with Character:** Pilots have been known to carry everything from building materials to goats and chickens—sometimes all on the same flight!

• **Weather Warriors**: With fewer navigational aids in remote areas, bush pilots often fly under visual rules, making them masters at reading the land, sky, and wind.

Why Pilots Love It

Ask any bush pilot why they do it, and you'll hear words like freedom, challenge, and connection. Flying in the bush isn't just about skill—it's about becoming part of the wilderness itself. Every landing is a small victory, every takeoff a thrill, and every trip a story waiting to be told.

For many, bush flying represents aviation at its purest: just a pilot, an airplane, and the endless wild skies.

THE AVIATOR

TRAINING SCHOOL

Vol. 1 Edition No. 1

https://theaviatortraining.com/