Positive Airplane Control (PAC): A Vision for Predictive Air Safety

Executive Summary

Positive Airplane Control (PAC) is a proposed aviation safety innovation designed to proactively mitigate mid-air collision risks. PAC introduces a cloud-connected, AI-assisted cockpit interface with dual acknowledgment protocols and voice-activated alerts triggered when pilot or ATC responsiveness is compromised.

Key Components

- Dual-Acknowledgment Protocol
- Voice-Activated Emergency Alerts
- Predictive AI Risk Monitoring
- Augmented Reality Guidance (Pilot Interface)

The Problem: Acknowledgement Blindspot

Even with advanced avionics and well-trained pilots, aviation safety is still vulnerable to one deceptively simple flaw: the lack of verified acknowledgment during high-risk moments. In modern airspace, pilots are often overwhelmed with tasks, while air traffic controllers juggle multiple aircraft, all relying on assumed compliance.

When a pilot fails to confirm a critical command or when a controller assumes compliance without response the delay or silence creates an acknowledgment blind spot. This gap can be catastrophic in high-congestion or time-critical scenario.

PAC is envisioned to close this acknowledgment blind spot before it becomes fatal.

Regulatory Alignment

PAC is intended to support the FAA's and EASA's strategic priorities, particularly those focused on airspace modernization, predictive risk identification, and reduction of human factor-related incidents. References include FAA NextGen programs and EASA AI Roadmap alignment.

Deployment Vision

PAC will be licensed to major manufacturers and embedded within cockpit systems. The system is modular, scalable, and designed to integrate with current ADS-B and TCAS infrastructure without requiring full aircraft retrofitting.

Legal Notice

References

1. FAA NextGen Programs https://www.faa.gov/nextgen

2. FAA Safety Briefing on Positive Aircraft Control https://www.faasafety.gov

3. EASA AI Roadmap https://www.easa.europa.eu/en/domains/research-innovation/easa-artificial-intelligence-roadmap

4. ICAO Global Aviation Safety Plan https://www.icao.int/safety/GASP 5. ADS-B Requirements and Implementation
https://www.faa.gov/air_traffic/technology/equipadsb

6. AC 120-109A: Stall Prevention and Recovery Training FAA Advisory Circular

7. Eurocontrol Human Factors in Safety https://www.eurocontrol.int

8. Aviation Safety Reporting System (ASRS) https://asrs.arc.nasa.gov