2025 Boeing ecoDemonstrator Explorer takes flight for IPS Testing

Boeing's latest ecoDemonstrator Explorer conducted flights over the Midwest portion of the United States, the United Kingdom and the European Union to test Internet Protocol Suite (IPS)—advanced digital communications designed to enhance operational efficiency and security while reducing congestion.

THE MISSION

The integrated team conducted live flight tests to demonstrate the efficacy of IPS and its readiness for initial deployment. Nine flight tests were conducted in the U.S. and in Europe.

THE AIRPLANE

This ecoDemonstrator Explorer is an in-service United Airlines 737-8.

- **The 737-8** was chosen for this testing because it has the architecture and satellite safety services equipage needed to demonstrate IPS. Additionally, this model can be retrofitted with IPS capability once the ground infrastructure is enabled per the FAA roadmap and the use of IPS on board the airplane is subsequently certified.
- **The ecoDemonstrator Explorers** conduct short-term testing, focused on improving safety and sustainability.

THE TEAM

- **Boeing:** Served as technology integrator and provided test ground systems and facilities
- **Collins Aerospace:** Supplied off-airplane technology for connectivity and avionics software
- **Embry-Riddle Aeronautical University:** Managed the FAA contract for testing
- **European Space Agency:** Provided VIASAT support and funding for the SATCOM-based IRIS global ATM solution
- **FAA:** Provided funding for IPS testing to modernize the U.S. airspace system
- **Honeywell:** Supplied avionics prototype software
- **NASA:** Collected aircraft data for operational enhancements
- **SITA:** Provided technology for air-to-ground connectivity and ground infrastructure
- **Thales:** Supplied SATCOM-related avionics software
- **United Airlines:** Provided test platform, Boeing 737-8, pilots and technical support
- **Viasat:** Provided SATCOM service technology and ground infrastructure

THE SCIENCE

IPS is an internet-based, multilink communication capability that provides safety-critical information for aviation.

- **IPS** is a future network communication standard that will provide an alternative to two legacy protocols that have been in use for decades and will eventually run out of bandwidth.
- **IPS** has significant potential to modernize data transfer between the flight deck, air traffic control and airline operation centers, and can work with existing communication protocols for safety services and strengthened cybersecurity.
- **Boeing** will share Airplane Operational Intent data with NASA, including current position and where the airplane expects to be at different points in time, to improve predictive routing algorithms and airspace trajectory planning for future air navigation and traffic control.

ITINERARY:

Flight
Oct 29-30
Domestic
IAH - IAH

Flight
Nov 1-2
Domestic
IAH - IAH

Flights
Nov 4
International
IAH - BGR - EDI

Flight
Nov 6
EU
EDI - EDI

Flights
Nov 7
International Return
EDI - BGR - IAH

*Routes shown are for graphic purposes.

THE IMPACT

The data collected from these flight tests will be used by the standards committees to enact changes for a technical framework and for future implementation.

- **IPS** is a key enabler for Trajectory Based Operations (TBO); TBO can optimize flows and reduce fuel use and emissions by up to 10%.
- **IPS** increases cybersecurity protections for air-to-ground communications and enables more efficient use of safety service bandwidth.

More information on the Boeing ecoDemonstrator program can be found here: boeing.com/sustainability/environment/ecodemonstrator

Scan to learn more about the ecoDemonstrator program.

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