



Aeronautics

Advanced Display Device for Aviation Safety and Operational Efficiency

Pilot head-worn display for
enhanced situation awareness

NASA's Langley Research Center researchers are developing a head-worn display system for pilots to improve safety and efficiency in aviation operations, particularly taxiway and runway safety at airports. Airports are experiencing tremendous increases in traffic, leading to runway near-incursions and incursions, setting the stage for potentially tragic accidents. NASA's technology provides pilots using the device with a voice-controlled system that displays a real-time, virtual display of the airplanes surroundings. Initial testing shows that this system provides significant safety and operational benefits during aircraft surface operations by enabling pilots to taxi alertly without having to look down at a cockpit screen.

BENEFITS

- ➔ Full-color display can show computer-generated airport view and aircraft state data in 3-D detail over an unlimited field of regard with minimal clutter
- ➔ Voice command simplifies operator interaction
- ➔ Head-worn display and voice interface minimizes the pilots head-down time
- ➔ Head tracking enables the system to highlight key information for the pilot, using symbols to direct the pilots attention to locations and objects outside the airplane
- ➔ Independent system - minimal impact on currently installed cockpit displays

APPLICATIONS

- ➔ Avionics - pilot head-up displays
- ➔ Transportation - ground/marine vehicle operator display
- ➔ Varied applications - military vehicles/vessels, construction, and mining operations

technology solution



NASA Technology Transfer Program

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THE TECHNOLOGY

The NASA system includes a head-worn display, a head tracker, computer hardware and software, and a voice recognition system. The system displays computer-generated images of the airport, taxi route, and traffic information on the head-up display, replacing traditional paper airport maps that pilots typically carry. Preliminary system trials managed by NASA suggest the system provides an increase in surface situational awareness, as well as reduced workload, compared to currently available technologies.



Heads-up display depicted roll-out, turn-off, and taxi guidance



Head-worn display

PUBLICATIONS

Patent No: 7,737,867

National Aeronautics and Space Administration

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