Looking for trouble
A NASA plane is flying in the Orlando, Fla., area testing devices that identify "microbursts," deadly winds that can cause plane crashes. Such instruments would supplement windshear-detection radar being installed at U.S. airports.

1 Microburst consists of cold air blasting down from a shower or thunderstorm
2...causing a sudden shift in wind speed and direction that can cause planes near the ground to crash.

The NASA 737 is testing three kinds of microburst detectors:

- Doppler radar: Radio waves bounce off raindrops. Reflected waves detect air motions typical of microbursts.
- Laser radar (called Lidar): Laser light reflects off particles in air, detecting motion.
- Infrared light: Senses air temperature changes, which can indicate microburst.

Source: NASA Langley Research Center
By Julie Stacey, USA TODAY

Danger in the air:
Pilots storm into violent winds

By Jack Williams
USA TODAY

ORLANDO, Fla. — Tourists might not like the idea, but Roland Bowles would love to see lots of heavy showers over central Florida for the next couple of weeks.

Heavy Florida rains are sometimes accompanied by potentially dangerous winds called microbursts — the object of research by Bowles and a group of 50 NASA pilots, scientists and technicians.

Unexpected microbursts have caused several airline crashes, including one in New Orleans in July 1983 and another at the Dallas-Fort Worth airport in August 1985 that killed a total of 287 people.

When the weather looks promising — for microbursts, not for a good day at Disney World — Bowles and about 30 others strap themselves into a Boeing 737 and go looking for the kind of weather pilots usually are taught to avoid.

"It sounds dangerous, but really it's very well-orchestrated," NASA pilot Dick Yenni says. "I guess we do take some risks, but they're so well-calculated it's probably about as dangerous as the space shuttle."

For instance, the NASA 737 flies into potential microbursts at about 240 mph. A jetliner that runs into a microburst landing or taking off is likely to be going less than 150 mph with landing gear and flaps down, making it harder to quickly gain the speed needed to escape.

"All you have to do is outrun it or outclimb it," pilot Lee Person says of a microburst. "We can do both."

The NASA researchers aren't trying to find out what a microburst can do to an airplane.

Their aim is to learn more about microbursts and to test on-board warning devices that could be required on airliners by 1996.

Working from a ground-based radar system, Massachusetts Institute of Technology scientists guide the NASA 737 into showers that look like microburst producers. Yenni makes the final decision. "If we decide it doesn't look right, we don't do it, much to the dismay of the researchers," Yenni says. "But they get over it."

The ground-based microburst warning radar is a prototype for radars that the Federal Aviation Administration is installing at major airports around the country.

Even with these radars, on-board warning devices are needed, Bowles says. All airports won't have the ground radars, and the on-board devices could give quicker and more precise warnings. "You would be like the turtle: Your protection goes where you go," he says.

The researchers are looking for a balance between detecting all dangerous microbursts, but without giving false alarms, Bowles says.

Doppler radar to aid airports

To detect microbursts and other dangerous weather, the Federal Aviation Administration is installing ground-based systems — called Terminal Doppler Weather Radar — at many major airports.

Experimental units in operation: Denver's Stapleton, the Orlando, Fla., airport.

Now being installed: at the Memphis airport and at the FAA Training Center in Oklahoma City.

To be installed in 1993: Houston, Atlanta, Washington, Chicago, the new Denver airport, New Orleans, St. Louis, Orlando (a permanent unit), Tampa.

Units are to be installed eventually at 43 other airports in the USA.

— Jack Williams

Full weather, 12A