

## Computerised ATM takes worry out of being close

A computer-based alternative to current air traffic control (ATC) systems is being demonstrated by Sensus on Stand C32, Hall 2.

Called the New Model for Air Traffic Control, the system provides advice to air traffic controllers on the climb, descend or turn instructions for each aircraft, based on their computed routes and other aircraft in the area.

"It is rather like the satellite navigation system found in a car, where the system tells the driver whether to go left, right or straight on," says inventor David Parkinson of Sensus.

He says that by putting the whole ATC issue under computer control, conflicts are eliminated from all normal ATM operations.

He adds that with networks of computers looking after all flights, routes could be optimised, ATC delays eliminated, fuel savings made and safety



**David Parkinson:** looking for partners

increased.

Using the demonstration system at the show, visitors are able to carry out the role of a future air traffic controller.

After generating the advisory instructions for the controller the text-to-speech capability of modern PCs can be used to get the computer to speak the instructions in genuine radio telephony (RT) phraseology as the system talks to the simulated aircraft.

"Even at traffic levels higher than those of today a person with no previous experience can be using the system within a couple of minutes of sitting down," Parkinson says.

"Our aim at the show is to locate a partner company with which to develop a full multisector simulator within 12 months. The first organisation – an air navigation services provider or systems manufacturer – to understand this approach fully will have an enormous and immediate global market place."

## Canadian research logs wake vortex data

The dangers of turbulence behind en route commercial aircraft could be better understood and thereby limited, following new research by Canada's National Research Council Institute for Aerospace Research (NRC Aerospace).

NRC Aerospace (Hall 4, C17a) has installed and tested new instrumentation on its Canadair CT-133 aircraft that will enable it to gather extremely detailed information on the effects of turbulence generated by commercial aircraft.

Aircraft travelling through wake vortices can experience substantial aerodynamic loading and flight path upsets, possibly causing injuries to passengers and structural overload.

Armed with its new air data acquisition system, which can collect 600 samples of inertial and air data a second, the CT-133 performed six calibration



**The NRC CT-133: gathering information on the effects of turbulence.**

flights in May, followed by a wake vortex flight behind three commercial aircraft – an Airbus A310, A319 and Boeing 767-300.

Later this summer, NRC Aerospace will refine the instrumentation and undertake further data gathering flights.

The study follows one conducted by NRC Aerospace in 2004, using a Dassault Falcon 20 and less

sophisticated instrumentation.

Anthony Brown, NRC Aerospace research officer and test pilot, says: "We gathered data at 600Hz, which is 600 samples per second. To our knowledge, this is the first atmospheric research aircraft to do so at that high a rate. It gave us an immediate impression of the wake vortex flow field that we just didn't observe

when we gathered data at 32Hz using the Falcon. As a result, we feel that this is a good platform to obtain detailed information on wake vortex flow fields.

"Our goal is to obtain data on the flow phenomena to clarify the risk and highlight the desirability or the need to develop wake vortex turbulence warning instrumentation that can be installed on aircraft."

# SafeRoute puts pilots in the picture

## Steve Nichols

ACSS (on the L-3 display at Hall 4, A14) is forging ahead with the development of the SafeRoute software suite for its TCAS products.

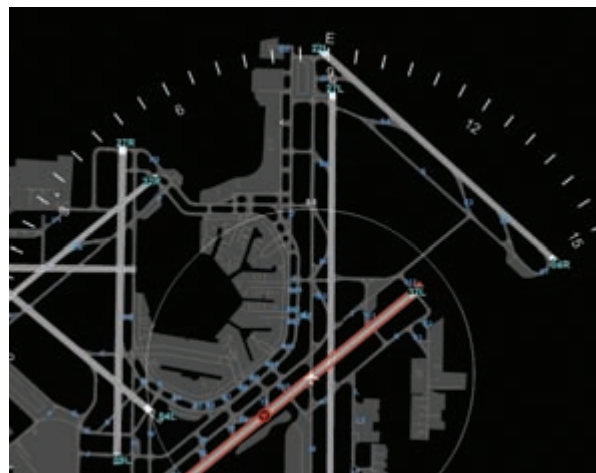
SafeRoute, which uses Automatic Dependent Surveillance-Broadcast (ADS-B) technology, offers a number of software options including merging and spacing (MAS) and surface area movement management (SAMM).

The system works by tracking every aircraft in its vicinity that is equipped with a standard-fit Mode S transponder.

## Largest

UPS, the world's largest package delivery company, is adding Saferoute with the SAMM and MAS options to its aircraft. Boeing is also involved with the project by displaying the SafeRoute information via the Jeppesen Class III electronic flight bag (EFB), which it manufactures.

ACSS president Kris Ganase says: "The relationship we have with Boeing is giving us a lot more opportunities for other aircraft.



**The SAMM display.**

"We are still on schedule to have our first flight trials with UPS in November this year on their Boeing 757 aircraft and certification is still targeted for mid-2007."

Ganase says SafeRoute's SAMM capability offers pilots a better picture of what is happening around them when they are on the ground.

"The SAMM option not only shows a pilot where he is on a runway or taxiway, but where other aircraft are as well. It shows flightcrews their position on an airport surface map and by using other aircraft's ADS-B transmissions, plus TIS-B and

CDTI data, can display the position of other aircraft.

"As SafeRoute is software-based, it can be added as an upgrade to our existing ACSS TCAS products, including T<sup>2</sup>CAS, TCAS 3000, or TCAS 2000, or it can be hosted within a competitor's system as long it complies with the ARINC653 standard."

Ganase adds that the SafeRoute SAMM option has cost-saving implications too. "If a pilot has a better picture of how many aircraft are taxiing and queuing to take off he can make a more informed decision as to whether he

should start the engines or APU."

SafeRoute's MAS option is also capturing operators' attention due to potential for fuel savings. At a typical commercial airport, aircraft arrive in bunches, causing headaches for air traffic controllers who have to juggle the demands of aircraft wanting to get on the ground with safety and other considerations.

## Plan

SafeRoute's MAS facility allows pilots to plan their routes more carefully by showing what aircraft ahead are doing up to 100nm (185km) out. The pilot can then adjust speed to sequence or converge with them in a more efficient manner.

ACSS is also looking at a SafeRoute option that it calls Intrails Procedures.

"This will provide the pilot with enough information to allow him to safely overtake a slower aircraft on long-haul routes." Ganase says. "We are focussing the development of our products on what is already out there and in use. ADS-B is going to be an important component of the Next Generation Air Transport System (NGATS)."

## Light relief from Rockwell Collins

Rockwell Collins (Hall 4, Stand F10) is showcasing its CISS-2100

Configurable Integrated Surveillance System, which combines weather detection, traffic alert and collision avoidance, Mode S surveillance and terrain awareness and warning functions into a single system.

It also features Rockwell Collins' MultiScan Hazard Detection System, which provides fully automatic weather hazard detection up to 320nm, ground clutter suppression, and enhanced turbulence detection capabilities.

The CISS-2100 uses 40% fewer parts than traditional aircraft surveillance systems, reducing the weight, volume and power consumption.

## Eaton's low-cost fluid sensor

A new oil indicator sensor that determines oil fluid levels in intermediate, tail rotor and main gearboxes has been developed by Eaton Aerospace (Hall 4, F12).

The retrofit item works with existing aircraft wiring interfaced with a remote indicator at the cockpit caution panel to detect the presence of oil.

This also eliminates additional wiring and space requirements and minimises upgrade costs.

## Thales upgrades Merlin sonar

Thales UK (Hall 3, C5) has been awarded a £27 million contract by Lockheed Martin to upgrade the acoustics (sonar) system of the Merlin multi-mission helicopter.

The award covers the upgrade of 30 helicopter systems with options for eight further systems in the future.

The upgrade, together with a Sonobuoy command and receiver system, will give the aircraft enhanced performance, especially in shallow water environments.

The upgrades will be undertaken by Thales UK's underwater systems Anti Submarine Warfare (ASW) Airborne group in Stockport, England, and supported by airborne group elements in Brest, France.