

NASA to fly supersonic Tu-144

NASA HAS confirmed plans to use a Tupolev Tu-144 supersonic transport as a research testbed for its High-Speed Research (HSR) programme.

A later model Tu-144D built in 1982 will be modified by Tupolev under an \$8 million, three-year contract with NASA and the US HSR industry team, including Boeing, McDonnell Douglas, Rockwell, General Electric and Pratt & Whitney.

Funding for the flight-research effort is being provided by NASA's Office of Aeronautics, through its Virginia-based Langley Research Center in a contract with Boeing.

The collaborative plan, first considered late in 1993, calls for up to 35 test flights in the initial phase. For the flight tests, Tupolev will modify the Tu-144 with several new airborne data sensors and re-engine it with four Kuibyshev KKBK NK-25 turbofans in place of the standard NK-144s. Tu-144s have been grounded since the mid 1980s.

The 245kN (55,000lb)-thrust NK-25 engines, from which the 196kN NK-144 is derived, are normally used to power the Tu-22M Backfire bomber. NASA believes that the engine change will produce performance more in line with the expected characteris-



NASA deal brings Tu-144 out of early retirement

tics of the proposed US high-speed commercial transport.

The first group of NASA engineers will travel to Russia in mid September "...to finalise plans to modify the aircraft and carry out experiments", says the agency.

The first flight is expected to take place in Russia in mid-1995. "The first operations will all be in Russia, but some could take place in the USA later on as the programme continues and any additional co-operative efforts are agreed on," says NASA's Dryden

Flight Research Center at Edwards AFB, California.

NASA HSR programme director, Louis Williams, says: "Using the Tu-144 is a perfect fit between our needs and their [Tupolev's] capabilities. It's a model for co-operative programmes with Russia.

"This effort will give us up-to-date information on the 'real world' conditions that a supersonic airliner operates in — data we wouldn't otherwise be able to obtain easily."

Boeing engineers will study

external and internal fuselage temperatures, thermal effects on structures, cabin-noise levels and boundary-layer measurement. Rockwell will also monitor the fuselage temperatures and boundary layer and build up a propulsion-system thermal database.

McDonnell Douglas will perform a handling-qualities assessment. NASA will provide personnel from its Dryden, Langley and Lewis Centers, as well as former Shuttle pilot and Convair CV-990 research pilot Gordon Fullerton.

General Electric, which was involved in the programme before Pratt & Whitney, is designing an engine-test rig in Cincinnati, Ohio, for fabrication in Russia. The company plans to perform two major ground tests: an evaluation of close coupled inlet structures and a study of engine-face reflections.

"One way to lighten the weight of an engine is to shorten the inlet," says GE, which will test a shorter intake duct to evaluate its effect on performance. The reflection tests will evaluate inlet-stability margins by inducing air-flow transients behind the duct and seeing what effect changes in the reflectivity of the shockwave pattern have on performance. □

Head-up displays get Southwest thumbs-up

SOUTHWEST AIRLINES has placed the largest-ever single commercial order for head-up displays (HUDs) by ordering 236 Flight Dynamics Head-Up Guidance Systems (HGS), worth more than \$45 million for its fleet of Boeing 737-300s, -500s and -700s.

The order came about through Southwest's purchase of Morris Air earlier this year, when the small operator was mid-way through a programme to install the Flight Dynamics HGS in its fleet of 18 aircraft.

"It was the primary reason why Southwest even considered it," says the company. "They saw what Morris was doing and said

'hey, this makes a lot of sense.'"

The HGS will allow Southwest to conduct Category III operations with landings in visibility as low as 690ft (210m), and take-offs in visibility down to 90m. The HGS also increases operating capability at Cat I airports.

Increased operational flexibility in bad weather is becoming an important feature for Southwest as it expands into new areas of the USA, particularly the north-west Pacific.

The Southwest order, which does not include the -200s in the fleet, brings the value of Flight Dynamics HGS orderbook to more than \$100 million.

Flight Dynamics, jointly owned

by Rockwell-Collins and Kaiser Aerospace and Electronics, is also conducting HGS certification programmes for the Canadair Regional Jet, de Havilland Dash 8, Dornier 328, Dassault Falcon 2000 and Saab 2000.

The system was also used by Alaska Airlines on its Boeing 727 fleet and is now being certificated for use in Cat IIIa conditions on its 737-400s.

Southwest is due to accept in October 1997 the first of 63 737-200s on firm order, with deliveries extending through to 2001. It has options on a further 63 of the type. The first 737-700 is scheduled to be rolled out in December 1996. □

NEWS IN BRIEF

■ **FAA GIVES RVR APPROVAL**
Teledyne Controls has received US Federal Aviation Administration approval to begin deployment of its new-generation runway-visual-range (RVR) system. The forward-scatter meter-visibility sensor is the first RVR certificated by the FAA for full Category IIIB take-off and landing operations — from 1,900m (6,500ft) down to 45m. It will replace RVR systems at 258 large US airports. A system has been deployed to the new Denver airport and up to 24 airports will have it by the end of 1994.