

Gripen, will be improved by including a new navigation system (NINS) that will eliminate the need for ground-based navigation aids, says Saab Gripen chief test pilot Ola Rignell.

NINS combines inertial and GPS satellite navigation with a terrain database working with the radar altimeter to improve navigational accuracy and provide terrain avoidance. Part of the system will be a new instrument landing system – NILS. Any 800m (2,600ft) roadstrip can be used as an all-weather airfield, without the need for ground crews to set up and man tactical instrument landing systems, says Rignell. The system is also compatible with commercial airports. NILS takes data from the terrain database and navigation system to guide the fighter to a landing in a similar way to ILS but without external aids.

Flight tests of a helmet-mounted display started in January as part of integrating the Thales Optronics/Cumulus/Kentron Guardian helmet with the Gripen for South Africa. The helmet system will also be integrated with the IRIS-T for the FMV. It provides flight reference information and weapons data, the latter including the ability to aim the missile off-boresight.

Saab/BAE is considering expanding the capability to a binocular helmet, Brown says, although it has not been decided whether this should have an integrated night vision system (such as the Eurofighter system) or if FLIR images from the IRST should be projected on to the helmet visor.

Flight simulators

MMI improvements are first tested on desktop computers before the systems are fitted in the development flight simulators at Linköping, says Saab/BAE technical sales manager Daniel Boestad. The simulator is equipped with the new Ericsson-Saab Avionics colour displays, which will equip export Gripens and Batch 3 JAS39 for the Swedish air force. Three 150 x 200mm (6 x 8in) MFDs replace an equal number of 130 x 150mm monochrome displays while a new upfront control panel moves the



The two-seat JAS39 will be developed for a number of new roles including on-site battle management

data keypad/display to below the HUD.

A development aircraft is due to start flying with the colour displays before July. Other flight tests of improved MMI equipment will in future be performed in a converted Saab Sk60 side-by-side trainer, with one half of the cockpit modified to accept the new systems. Boestad adds that the FMV-funded programme uses off-the-shelf computers in the aircraft, which is due to make its first flight in August. Boestad says the aircraft will be used as part of the tests of a binocular, larger field-of-view, helmet and for direct voice input (DVI).

The aircraft will also be fitted for three-dimensional audio, which, for instance, allows the output from separate radio channels to appear as if they are coming from different parts of the cockpit. Boestad says DVI will initially be used for systems management such as changing radio channel or requesting fuel state, items that are not available with the top layer of commands controlled through the hands-on-throttle-and-stick system. Voice output is already used to inform the pilot of aircraft status and a wingman's activities. For instance, the aircraft will tell the pilot when a wingman has launched a missile.

Typically, radar and IRST data are shown on the right hand display and aircraft and systems data on the left-hand unit. On the middle MFD will be the tactical display – a “god’s eye view” of the battle – a fused image of radar and IRST information coupled with similar information from wingmen and the ground-based fighter controller passed to the fighter via its datalink. Öhman says navigation waypoints and target data – as well as EW information – can also be displayed on the tactical picture, which has automatic and manual declutter modes. As NetDefence develops, the god’s eye view will display a greater depth of information from land and naval forces as well as other fighters.

Display information

Öhman says simulator evaluations have shown that the colour makes it easier for the pilot to absorb the display information and improves categorisation of threats. For instance, although all enemy fighters may be given the same symbol, this can change colour as it becomes within range of the JAS39’s missiles, or the Gripen falls within range of the enemy aircraft’s weapons.

Datalinks are central to any electronic

“We are an integrator. We are building now so we are using available technologies.”

ANDREAS LADELL
SAAB AEROSPACE SYSTEMS
ENGINEER