AVIGUIDE
NEW-GENERATION
HEAD UP DISPLAY
Pilots rely on a large and complex amount of information to complete their mission safely. This information must be clear and intuitive to ensure the aircraft is in a head up and eyes out state – at all times.

Using our thinking edge, Saab has developed AviGuide, an advanced, multi-function system featuring a simple and open architecture. The solution is easy to install and has a short integration period. Powerful graphic processing enables complex image rendering from multiple sources in order to provide the crew with superior control – in all conditions.

**TACTICAL FLIGHTS**

Tactical waypoints and intuitive graphics reduce the risks of Controlled Flight Into Terrain (CFIT) during flights below clouds or radar. AviGuide will substantially increase the benefits of Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS) and similar systems compared to those commonly used today.

**APPROACH LANDING ZONE**

Artificial helipads and approach symbology will increase the probability of successful approaches in any conditions even without EVS or SVS. The intuitive graphics will help the pilot no matter if the landing zone is improvised, using a Localizer Performance with Vertical guidance (LPV) or an Instrument Landing System (ILS) approach.

**OIL RIG APPROACH**

An oil rig approach is a particularly difficult mission, often complicated by tight time schedules and less than perfect visual conditions. Head Up information will improve situational awareness and alleviate the risks from well-known hazards such as single references, CFIT and loss of spatial awareness. AviGuide is designed to be able to serve as a central part of systems with operational credits according to FAA AC No: 90-80B.
**FIREFIGHTING**

The altitude and heading references and the ground-directed water drop areas are displayed as conformal data on the Head Up Display (HUD) in front of the pilot, enhancing spatial awareness. A sudden loss of outside visual cues is no longer as much of an issue as without a HUD with conform presentations. AviGuide has the capability to overlay synthetic and/or enhanced vision data. Even cost-effective EVS sensors provide a remarkably clear picture through ordinary smoke.

**SARH**

HUD graphics help enhance pilot focus in difficult situations, such as adverse weather conditions. The range or time spent at an operation may be increased if the system is certified for approach and landing in reduced visibility.

**IFR & MARGINAL VFR**

AviGuide will alleviate difficulties related to transitioning to hover and descend modes under instrumental conditions, as well as marginal Visual Flight Rules (VFR).
SAAB’S OFFERING TODAY

Saab is working with an extensive roadmap for HUDs and related systems. Our current on-axis solution is very flexible, with optical and electrical modules designed to facilitate a high level of customisation while minimising cost and technical risks. Several versions that are well suited for the rotary wing market are already available or expected to be ready soon. AviGuide is designed to be certified to civilian standards with current and future opportunities for operational credits in mind.

**LARGER UTILITY AND MEDIUM-TO-HEAVY LIFT TRANSPORT HELICOPTERS**

Platforms in this size feature a large field of view and an eye box that allows normal head movements. Most will be able to use this form fit in both the right and left seats. The unit is created to be part of systems certifiable for operational credits.

**SMALLER UTILITY HELICOPTER**

With a narrower cockpit, the form fit from a larger aircraft might pose difficulties. The picture is from a 30° field of view solution for the right seat of a very tight mid-size utility helicopter. The unit is designed to minimise greenhouse area obscuration. It is NVG compatible and complies with normal HIC requirements. For even smaller cockpits, we have a unit with a 22° field of view.
In the 1980s, a new generation of helicopter-borne reconnaissance system integrated with the TOW missile began, called HeliTOW. The high magnification of the direct-view optic, combined with the inherent wide field of view and high performance IR, laser and CCD sensors, ensured excellent situational awareness. Best-in-class sensor stabilisation gave the system outstanding image quality. The Saab HeliTOW system won a number of high profile deals worldwide, including Belgium, Italy and Saudi Arabia.

**VIRTUAL IMAGE DISPLAY**
In the 1970s, the Maverick air-to-ground missile was integrated into the Viggen system. There was no space for the TV rangefinder on the cockpit’s instrument panel, which the pilot needed to view targets. The solution was VID, which is comprised of HUD-related optics without a reflecting glass and 90° prism. The optics presents a virtual picture that gives the pilot the impression of a larger screen floating in the air at a comfortable distance.

**HELITOW**
In the 1980s, a new generation of helicopter-borne reconnaissance system integrated with the TOW missile began, called HeliTOW. The high magnification of the direct-view optic, combined with the inherent wide field of view and high performance IR, laser and CCD sensors, ensured excellent situational awareness. Best-in-class sensor stabilisation gave the system outstanding image quality. The Saab HeliTOW system won a number of high profile deals worldwide, including Belgium, Italy and Saudi Arabia.

**PANEL-MOUNTED ON-AXIS HUD**
This solution has the same large field of view and head motion box as our overhead mounted versions. It is very suitable for helicopters where the overhead structure limits installation of an overhead mount. Modern flat panel glass cockpits often free up space behind the panels, which we use with this solution.

**FIGHTER HUDS**
The HUD was a huge step forward in aircraft design by making a fighter easier to fly, especially during extreme low-level flights. The development of the HUD resulted in the first wide angle HUD system with holographic diffraction optics, and since then the system has been developed and fine-tuned. Since the 1990s, this type of HUD has been established and is in use in most modern fighter jets.
AviGuide is an advanced, multifunction system with a simple and open architecture. It enables powerful graphics processing and complex image rendering from multiple sources in order to provide the crew with superior control, even in adverse weather conditions.

**SAFETY FIRST**
- Flight data with eyes out – fly and navigate head up
- Intuitive presentation – faster decisions
- Conformal data – situational awareness
- Enhanced/synthetic vision
- Enhanced control

**CONFORMAL DISPLAY**
- Improved awareness of aircraft state
- Flight Path Vector (FPV) improves energy management
- Head Up guidance display
- Head Up at IFR/VFR transition
- Precision take-off and landing

**OPEN AND CONNECT**
- Lightweight and compact
- Improved cost of ownership
- Compatible with EFVS – reduced minimums
- Compatible with future EFVS systems – SVS, CVS

**MISSION COMPATIBLE**
- Flexible and adaptable display modes
- Night vision goggle compatible
- Enhanced synthetic vision
- Integrated flight mission data
- Picture-In-Picture (PiP)
The AviGuide system consists of a HUD unit from either of our series of display units, depending on the need for field of view and the custom form factor.

The system also includes a Head Up Display Processor (HDP) for optimal processing of data and graphics based on a modular series depending on customer needs. The HDP interfaces electrically and mechanically with the aircraft structure sensors and systems, runs a variety of algorithms related to data verification and formatting, and generates the characters and symbols making up the display.

**TECHNICAL SPECIFICATIONS**

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**HUD SYSTEM (HDU + HDP)**

- Weight:
  - Rotary wing: 13 kg (29 lbs)
  - HDU: 7 kg (15 lbs)
  - HDP: 5 kg (11 lbs)
- Power: 28 VDC, 160 W (average)
- Environment: RTCA/DO-160F
- Software: RTCA/DO-178B Level A

**DISPLAY UNIT (HDU)**

- Total field of view:
  - 2000 series: 22° x 16.5°
  - 3000 series: 30° x 24°
- Resolution: 1400 x 1050
- Contrast: >1.3 at 10,000 ft ambient
- Luminance: >2,900 fl

**ELECTRONICS UNIT (HDP)**

- Size:
  - ARINC 600 2-4 MCU
- Power supply: 28 VDC
- Comprehensive I/O:
  - ARINC 429 input
  - ARINC 429 output
  - ARINC 818
  - Dual digital video output
  - RS-170 video input
  - RS-422 – RS-232
  - Discretes
- Electronic bore-sighting function
- Integrated BIT reporting to aircraft diagnostic system

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