Saab has a long tradition with Head-up-displays and optical products. The initial breakthrough came during the development of the supersonic fighter aircraft Saab 37 Viggen in the early 1960’s.

The design of this fighter was unique and on the forefront of development of modern fighters at the time. It had double delta shaped wings and canard wings, an onboard computer for navigational purposes and a head-up display system.

**Fighter HUD’s**

The premier Viggen flight was made in 1967 and it was taken in operational service by the Swedish air force in 1971, and then one of the most advanced fighter aircraft systems in the world.

The head-up display was a huge step forward by making a fighter aircraft easier to fly, especially on extreme low level flights carried out by the SwAF air-to-ground attack squadrons, when they trained to be a spearhead in the frontline of Sweden’s armed forces during the Cold War era.

The development of the HUD continued during the 1970’s, in cooperation the British company Smith Industries. This resulted in improved Field Of View, with better brightness and improved contrast making the symbols more visible.

Saab also cooperated with the American company Hughes Aircraft, who had the capability to manufacture a hologram big enough to meet the requirement in fighter aircraft. Saab (SRA) integrated the holographic display in a presentation system, which was flight tested in a Viggen by the FMV (Swedish defense Materiel Administration). This became the first airborne wide angle head-up display system with holographic diffraktional optics.

Sweden and Saab were thru pioneers in this field and the system was developed and fine-tuned. Since the 1990’s this type of HUD has been established and is in use in most of the modern fighter jets. This technology is also used in Saab’s combat proven Gripen fighter system, and hundreds of units are installed in the Gripen fleet, which is in operational frontline service in five countries.
Virtual Image Display (VID)
The Maverick air-to-ground missile was
integrated in the Viggen system during the
1970’s. There was no space for the TV
rangefinder on the instrument panel in the
cockpit, which the pilot needed to lock
on targets.
The solution to this problem was the Virtual
Image Display, which was installed to the
right of the HUD. Another term used for
VID is HLD – Head Level Display. The VID
contains of HUD related optics without
reflecting glass and 90 degree prism, and the
optics presents a virtual picture which gives
the pilot the impression of a larger screen
floating in the air at a comfortable distance.
An important characteristic of VID is that a
picture watched on distance is much easier
to read in turbulent and shaky environment
compared to an image featured in the instru-
ment panel. This makes VID excellent also in
ground combat vehicles.

HeliTOW
In 1980, Saab in cooperation with DRS
(formerly Emerson Electric in the US) begun
to develop a new generation of helicopter-
borne reconnaissance systems, integrated
with TOW missile etc., called HeliTOW.
The basic HeliTOW was primarily devel-
oped for helicopter-borne reconnaissance
with high performance in the form of long
range target acquisition, i.e. detection and
identification primarily of ground targets, as
well as guidance and control of TOW mis-
siles and various other weapon systems as
swiveling guns etc.
The high magnification of the direct-view
optics used in HeliTOW, combined with
the inherent wide field of view and high
performance IR, Laser and CCD sensors etc.,
ensured excellent situation awareness. Best
in class sensor stabilization gave the system
outstanding image quality.
The Saab HeliTOW system won a number of
high profile deals worldwide for the system
during a number of years.
The systems where combat proven in several
countries and theaters all over the world.
The HeliTOW systems where integrated on
many different helicopter platforms:
- Eurocopter AS550 Fennec (Denmark and
  Singapore)
- Eurocopter Bo105, (Sweden and Nigeria)
- AgustaWestland A109BA (Belgium)
- AgustaWestland A129 Mangusta (Italy)
- Bell 406CS (Kingdom of Saudi Arabia,
  through a FMS deal)
More than 150 helicopters/systems where
delivered together with the respective heli-
copter manufacturer (OEM).
The total value of the Saab HeliTOW pro-
grams where in excess of 300 Million Euros,
and Saab still support the systems that
remain in operation.