



SAAB

Electronic
Warfare
Antennas

Superior
Reception



World class performance in tough environments

Saab has been providing Electronic Warfare (EW) antennas and antenna sub-systems to the international defence market for over three decades.

Our high performance, reliable and compact antennas have been used in a large variety of systems for:

- Radar Warning Receiver (RWR)
- Electronic Support Measures (ESM)
- Electronic Intelligence (ELINT)
- Communication Intelligence (COMINT)
- Electronic Countermeasures (ECM)

All our products are designed and tested to military standards for any platform from naval surface and subsurface to airborne subsonic and supersonic.

We have a large variety of Military Off The Shelf (MOTS) products, but specialise in designing custom antennas or customising standard antennas. The core range of products comprise spiral-, sinuous-, horn-, LPDA-, biconical-, blade- and reflector antennas, particularly where extreme bandwidths or rugged designs are required.

All antennas are produced and tested in-house.



Saab has also developed and produced a large variety of antenna sub-systems, typically customised to specific user-and system requirements. These systems can comprise multiple antenna sets in different frequency bands and of different polarisations, optimized for customer specific Direction Finding (DF) techniques and integrated into housings that minimise installation effects.

By combining high performance integrated antennas with complementary products like RF front ends, switching matrices, microwave modules, controllers, positioners and radomes, Saab caters for almost any EW antenna sub-system requirement.

Our access to in-house and local antenna test ranges enables us to fully characterise these sub-systems, often delivering units with complete calibration coefficients, reducing integrated system testing requirements.

Electronic Warfare Antennas Key Features

- Designed and tested to military standards
- Extreme broadband applications
- Lightweight and compact
- Magnitude and/or phase matched sets
- Military off the shelf products
- Custom designs
- Integrated antenna sub-systems for high accuracy Direction Finding
- Integrated, custom RF Front Ends
- Platform placement studies
- Manufacturing and testing
- ITAR free

Spiral antennas - have found many uses in EW because of their circular polarisation, broad bandwidth and constant beamwidths. Saab offers a wide range of broadband, cavity backed, planar spiral antennas covering frequencies from 300 MHz to 42 GHz, many qualified for airborne use on high performance aircraft. Our standard portfolio ranges from a 300 mm diameter 0.3-2 GHz antenna to a 19 mm diameter 18-40 GHz antenna, with many other standard and nonstandard frequency bands and sizes in between. Customised designs for frequency bands, circular polarisation direction, form factor, mounting, colour and radomes can be implemented.

We pride ourselves in our ability to design and produce extreme bandwidth Marchand baluns up to 20:1, which result in improved squint and axial ratio performance. Inline fed spirals are available exceeding 40:1 bandwidth. Many of our spiral antennas are designed to be electrically small to enable tight array spacings for broadband interferometer applications. These antennas are typically supplied in sets, tracking each other in phase over frequency and angle.

Sinuuous antennas - are known as the ultimate EW antenna and for good reason - Modern RWR, ESM and ELINT systems are replacing spiral antennas with sinuous antennas because they offer full polarisation coverage and better pattern stability. We have perfected designing and producing these high complexity antennas and offer various options from 150 MHz to 18 GHz, either dual linear or dual circular polarisation with internally integrated hybrid. We offer some of the smallest dual circular antennas while achieving world class performance including a 2" diameter, 2-18 GHz antenna and a unique 1" diameter 6-18 GHz antenna. Customised designs and phase tracking sets are available.

Blade & Button antennas - are monopole-based omnidirectional antennas with integral, shaped radomes. We offer broadband, rugged blade antennas, typically provided in phase tracking sets, for airborne interferometer based direction finding in COMINT or C-ESM applications. Button antennas are electrically small making them ideal for compact signal monitoring or as a Built-In Test source. Standard blade antennas bands are 25 MHz to 500 MHz and 500 MHz to 2 GHz, and can be provided in sets of 8 or more units. A typical button antenna is optimized for 1.5 to 18 GHz and can handle 20 WCW.



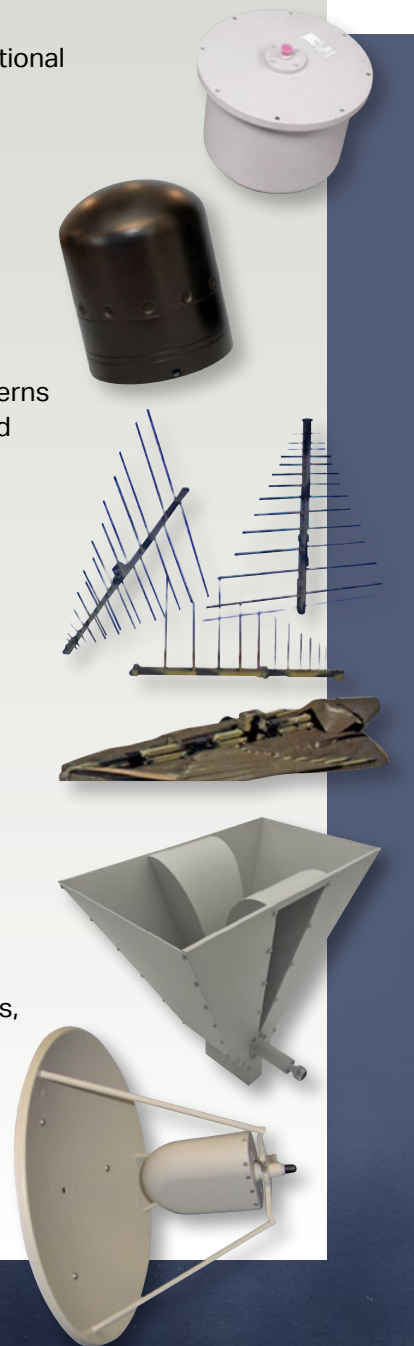
Biconical omnidirectional antennas - provide broadband omnidirectional coverage, making them ideal for signal monitoring, sidelobe blanking or receiver tasking EW applications. We offer land-, naval- and airborne versions, with relevant polarisers and radomes, and often integrate these antennas into antenna sub-systems. We offer a range of products covering 500 MHz to 40 GHz, either vertically- or slant-45° polarised. Standard antennas include typical frequency bands like 2-18 GHz and 18-40 GHz, with ultra-broadband 0.5-18 GHz single band antennas also available.

Log-Periodic Dipole Array (LPDA) antennas - offer directional patterns over very wide frequency bands. Although this type of antenna has found many applications, the Saab portfolio is mostly focused on ruggedised land and helicopter based jamming.

A typical example is a 100 to 1000 MHz ruggedised antenna that can handle up to 800 W CW of power and has been qualified for helicopter use. For testing- and reflector feed applications we also produce a lightweight, broadband etched 1-40 GHz version with a radome.

Horn antennas - provide relatively high gain over limited bandwidths. Saab has, however, invested in the capability to design extreme bandwidth horn antennas, offering a unique 0.5-18 GHz unit ideal for EMC/EMI testing. The other typical application of our horn antennas is for airborne based jamming. This is normally implemented in 2:1 or 3:1 bands, with power handling capability up to 800 W CW. Optional high power polarisers are also available.

Reflector antennas - are used in a wide variety of applications where high gain and narrow beams are required. As with the rest of our products, we specialise in broadband applications, typical thus steerable ELINT, spinning DF or radar simulators. Reflectors with custom shaped patterns can be designed and be paired with many of our broadband antennas as feed, depending on specific requirements.



Amplitude and phase DF sub-systems -

use multiple spiral-and/or sinuous antennas integrated into a sub-systems for custom DF solutions. Our core specialities of compact and phase tracking antennas make for high performance systems. Typical implementations make of use partial or full circular arrays of 2 to 6 elements. Using these configurations with typical DF techniques can provide ambiguity free angular errors of sub-2°. These sub-systems can include omnidirectional and GNSS antennas and can be supplied with integrated Saab- or third-party RF components.

Interferometer panels - typically using three or four spiral- or sinuous antennas, can be used to achieve DF accuracy of sub-1° over a 120° sector. Our panels can include radomes and integrated absorber to reduce platform installation effects, and elements spacings are customer defined to match the DF algorithm requirements. Our leading product is a unique single band 1-18 GHz, 4-element, compact, lightweight unit ideal for small airborne platforms and drones.

Spinning DF sub-systems - sacrifice instantaneous Probability of Intercept (POI) for significantly improved range and DF accuracy. Using reflector-, horn- or LPDA antennas that rotate at up to 400 RPM, the gain is increased by up to 25 dB and the achievable DF accuracy is fractions of a degree, making it an ideal monitoring ELINT solution. The rotating assembly, with optional RF front-ends, is housed under a radome and paired with an omni-directional antenna for monitoring or sidelobe suppression. The positioners have fast spin-up times and can be used in various modes for tracking or sector scanning. Our spinning DF sub-systems are highly customisable and have been used in land stationary, land mobile, naval and even airborne applications.

Platform simulations - our knowledge of antenna design and EM design tools, means that we can simulate antenna installation effects accurately, and predict the resulting system performance. Using the information leads to optimised antenna placement early in the design cycle, and can also be used to analyse EM system interoperability.





Photographs represent typical antennas of the type, final product may vary.
Specifications subject to change without notice.

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