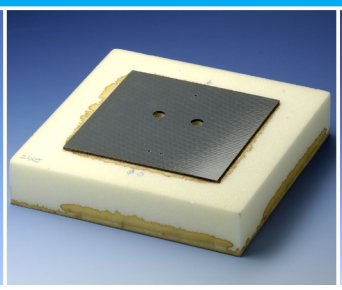
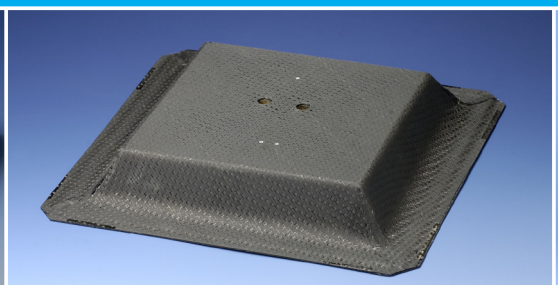
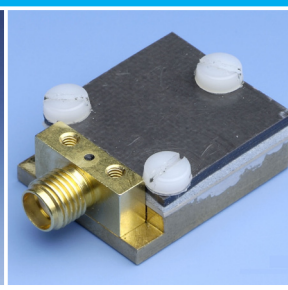
Smart Airborne Antennas

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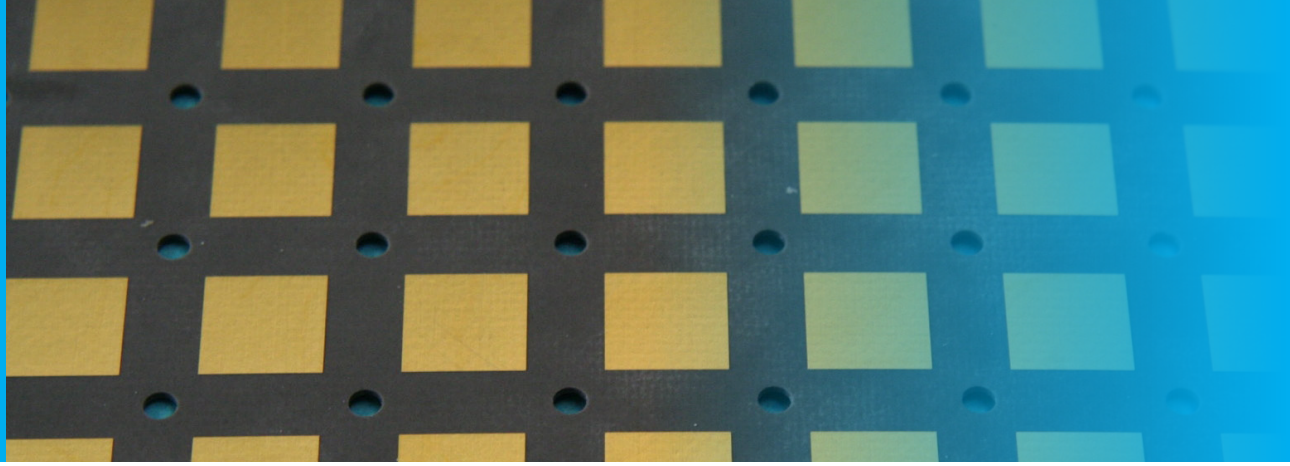
"SUPPORTING YOU IN SOLVING THE INCREASING DEMAND FOR ANTENNAS IN AEROSPACE"

- Development of low-profile and structurally integrated antennas for satellite communication and satellite navigation
- Research into smart airborne antennas adaptable to its environment



What you need

- Low-profile high-gain antennas for satellite TV or Internet on board aircraft
- Structurally integrated communication antennas on RPAS/UAS
- Smart satellite navigation antennas with suppression of intentional interference.

What we deliver

- Support in design, development and integration of electronically steerable antennas into aircraft structures
- Multi-disciplinary know-how, tools and facilities for investigation of electromagnetic and mechanical interaction of antennas with its surrounding structure.

Structurally integrated antennas

We develop composite panels with embedded multilayer antennas. The skin of the panel is transparent for the electromagnetic signals received by the embedded antennas. The panel withstands the applicable mechanical, temperature and aerodynamic pressure loads applied during flight.

Smart antennas

We develop prototype planar phased array antennas for broadband Ku-band satellite communication for satellite TV reception and Internet on board aircraft. During flight, this antenna system (without moving parts) continuously steers its beam towards the geostationary satellite to be received.

We develop electronically steerable antenna arrays to be integrated into light weight structures of air vehicles, which are subject to aero-mechanical vibrations. Such vibrations degrade the antenna performance. Smart antenna technology can re-establish the antenna radiation characteristics and can improve the quality of data communication. In real-time the phase errors due to displacement of the antenna elements can be measured and the beam of the array can be adapted accordingly.

We investigate Controlled Reception Pattern Antennas (CRPA) to mitigate (intentional) interference in reception of satellite navigation signals. Here the reception pattern of the antenna is adapted in such a way that the interference signals are suppressed.

Measurement facilities

We operate several facilities for the measurement of antenna performance. We have a far field outdoor Antenna Test Range of 160 m which can be used to measure the radiation pattern of prototype antennas, either stand-alone or installed on a cockpit mock-up or a reduced scale aircraft. We also can perform in-flight measurements with our research aircraft which has facilities for installation of antennas. In-flight antenna measurements on helicopters can be performed from our heliport.

European cooperation

As partner in the European FP7 project SANDRA we developed a low-profile Ku-band SatCom antenna that covers the complete receive band for aeronautical earth stations and DVB-S broadcast in Ku band (10.7 – 12.75 GHz). The antenna front-end consists of 32 tiles where each tile has 8x8 Ku-band stacked patch antenna elements. Optical True Time Delays in an Optical Beam Forming Network enable a squint free beam steering over the whole band to geostationary satellites.

Features

- multilayer dual-frequency band
- broadband Ku-band satellite communication
- electronic beam steering
- low-profile
- high-gain
- airborne
- integrated into light weight structures
- suppression of intentional interference

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