Cobham Antenna Systems

Antenna capabilities and solutions

The most important thing we build is trust

Cover image courtesy of AgustaWestland
Experience You Can Trust

Cobham Antenna Systems’ pioneering spirit, breadth of capability and worldwide reputation for quality and reliability have made it a world leader in the design and manufacture of communications and navigation antennas and subsystems that enable people to communicate and navigate on land, at sea and in the air.

With more than six decades of antenna design experience, Cobham Antenna Systems leads the industry in the design of tuned, low profile and conformal airborne antennas as well as rugged, reliable and high performance land based antennas.

RF devices closely associated with the antenna solutions include couplers, combiners, filters, diplexers, attenuators, LNAs and HPAs.

The antenna products are complemented by a range of RF and digital subsystems that meet the increasing demand for communications on the move. These associated products include direction finding systems, avionics subsystems, interference cancellation and airborne TETRA radio systems.

As part of Cobham plc, a global aerospace and defence company, Cobham Antenna Systems has the scale to support continual development of their own market leading products as well as partnerships with other companies within the Cobham group to further enhance their capabilities.

Cobham Antenna Systems offer a complete design to supply solution for innovative antenna systems covering a broad range of civil and military applications at operating frequencies ranging from HF through to microwave.

With its great wealth of experience and a forward thinking approach Cobham Antenna Systems is able to match the antenna solution to the customer’s requirement. In many cases an off the shelf solution can be provided from the existing broad product range. Alternatively an adaptation of an existing product can be provided, giving the assurance of a proven and reliable solution that is tailored to meet the needs of the customer.

If a solution is not already available then the company’s team of experienced design engineers will collaborate with the customer to develop a new product that will deliver the capabilities required.

The company is constantly looking to the future and developing its own innovative and cutting edge solutions to meet the increasing demands of the latest communications systems. Products meet exacting requirements to enable dependable communications, navigation and jamming from troops on the ground to supersonic aircraft in the sky, improving operational effectiveness to ensure mission success.

1 Conformal and low profile antenna on Eurofighter Typhoon
2 Terminal & SATCOM communications and interference mitigation on light armoured vehicles
3 Full antenna and DF suite on AW101
4 Manpack and bodyworn antennas
5 Satellite communications, navigation and TETRA on Embraer Legacy
Cobham Antenna Systems possesses the full range of capabilities required to take the customer’s antenna requirement from a concept all the way through to a manufactured solution.

Modelling and Simulation

Cobham’s world leading RF design team use their vast experience as well as a comprehensive set of computer modelling tools to reliably predict the antenna’s electrical performance. Techniques such as Method of Moments, Finite Elements and Finite Difference Time Domain are used to determine aspects of the antenna performance such as radiation pattern, antenna port matching, Radar Cross Section (RCS) and On Platform Installed Performance.

Antenna Prototyping

Cobham Antenna Systems has a major investment in facilities and personnel to support the rapid prototyping of products in development. Technicians are highly skilled in the assembly of PCBs and cable assemblies, and the capability of the prototyping team is enhanced by the ability to link the computer generated 3D solid model of the product to automated CNC milling machines to enable fast and accurate prototyping of complex objects.

The company’s materials specialists provide expertise in the selection and processing of materials, ensuring the properties are tailored for optimum product performance.

Performance Verification

Each design is engineered to operate and survive in its native and often hostile environment. The mechanical and electrical performance of the product is verified using the company’s in-house test facilities which include multiple anechoic chambers, two free space test ranges, and a range of environmental test chambers.

From an RF perspective, parameters such as radiation pattern performance and gain and impedance matching are tested to validate the actual operating specification.

Mechanically, a full suite of environmental test facilities are available to measure the product’s performance against factors such as vibration and shock, lightning, humidity, temperature etc.

Product Development Life Cycle

The design team benefits from hundreds of man years of experience gained from the successful development of thousands of products that span across a broad spectrum of platforms. They have a deep understanding of how the equipment will be used and how to optimise its performance for the particular environment it will be operated in, giving the customer peace of mind that their problem is understood. In conjunction with its technology leading research Cobham is able to create an antenna concept which best matches the customer requirement.

Solution Conceptualisation

The ability to predict antenna performance through computer simulation accelerates the product development process by reducing physical prototype iterations, enabling development of the most efficient and cost effective solutions.

The product is developed using the latest 3D design software to create a model which can then be used for further electrical and mechanical analysis. The mechanical properties of this model can be analysed using techniques such as Computational Fluid Dynamics and Finite Element Analysis to verify the aerodynamic performance and structural integrity of the design at an early stage.

Qualification and Certification

Cobham’s equipment and systems are so highly depended upon that precision and reliability cannot be compromised. Cobham Antenna Systems qualifies its products to a range of civil and military standards such as DO-160 and M&B-STD-810. The company’s approved design and production procedures enable ETSO, TSO and UK Civil Aviation Authority equipment approvals to be obtained under the following authorisations: EASA PART 21 G, EASA PART 145, EASA AP DOA and UK CAA BCAR Design Approval. The company also holds approval to ISO 9001, AS9100 and UK Military Aviation Authority (MAA) requirements.

Pre-Production

Following prototyping and design verification the antenna moves into the pre-production area where low rate initial production (LRIP) is carried out. The production process is closely controlled and the assembly method is optimised to ensure robustness and quality. Specialised tooling is developed to further improve efficiency and consistency before the antenna moves into full scale production.

Production

The antenna migrates to the main production area where high rate production is carried out to the transfer of responsibility to the designated production cell. Staff are trained by our in-house teams to produce products to the highest standards. Each design moves through a dedicated area for initial production (IP) before moving to the LRIP area where low rate production is carried out. Following prototyping and design verification the antenna moves into the pre-production area where low rate initial production (LRIP) is carried out. The production process is closely controlled and the assembly method is optimised to ensure robustness and quality. Specialised tooling is developed to further improve efficiency and consistency before the antenna moves into full scale production.

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Advanced Products with Proven Performance

Air Collision Avoidance System (ACAS)
The low profile ACAS antenna was developed for Rockwell Collins in support of the latest Boeing 787 civil airliner, incorporating a phased array with both directional and omni-directional transmit and receive modes.

Civil Aircraft
- Boeing
- Airbus
- Embraer
- Dassault
- Gulfstream
- Bombardier
- Pilatus
- CAC

Rugged MUOS Antenna
To provide effective and robust communications on complex vehicle platforms, a ruggedised ground plane independent UHF SATCOM antenna was developed for use on marine platforms and future fighting vehicles.

Armoured Vehicles
- MRAP
- LAV-C2
- Challenger 2
- Bushmaster
- Rookat 101
- Warrior
- Landrover
- Abrams

Tuneable Antenna
A tuneable antenna providing maximum gain performance for minimum size was developed for the frequency hopping radios aboard the Sikorsky UH-60 Black Hawk helicopter.

Transport/Tankers
- A400M
- C130
- C27J
- A330 (STARS/MRTT)
- Erieye
- C295
- Nimrod
- C17

UAVs
- Watchkeeper
- Fire Scout
- Global Hawk
- Predator
- Mantis
- Reaper
- MALE
- Tarans
- X-48B

UAV
Communication and Navigation antennas for Northrop Grumman Fire Scout UAV.

Conformal UHF SATCOM Antenna
The conformal UHF SATCOM antenna fitted in the nose cone in front of the cockpit of the McDonnell Douglas F18-Strait Eagle.

Fast Jets
- Typhoon
- F15
- Gripen SAAB
- Rafale
- Tornado
- F-16
- Mirage
- SU-30

Nose Cone Radome and Antenna
Combined radar nose cone with integral navigation antenna, together with a commms & navigation suite.

Trainers
- T-50
- Hawk
- M346
- Super Tucano
- T-6B
- Falcon
- KT-1
- PC-9

Anti-Jam GPS
The Controlled Radiation Pattern Antenna (CRPA) and Digital Antenna Control Unit (DACU) provide an anti-jam GPS system to the AgustaWestland 159 Lynx Wildcat helicopter.

Helicopters
- Eurocopter
- AgustaWestland
- Sikorsky
- Boeing
- TAI
- KAI
- MHI
- Bell

Multi Function Antenna
A manpack antenna incorporating a broadband communications antenna with an integrated L1, L2 GP element provides effective communications and navigation ability whilst reducing the weight and footprint of the systems carried by personnel on the ground.

Infantry Programmes
- Bowman
- STARS V
- WIN-T
- Clansman
- MTBR
- Falcon
- JP2072
- Grintek

Just some of the many platforms on which Cobham Antenna Systems antennas are utilised:
The following capability brochures are also available by request:

- Airborne TETRA Radio Installations
- Direction Finding Systems
- Rotating Microwave Sub-Systems
- Coastal Cable Assemblies
- Dischargers for all airborne applications
- Vehicle Communications and Jamming Antennas
- Microwave Antennas
- Manpack and Portable Jamming Antennas
- Airborne TETRA Radio Installations
- Direction Finding Systems
- Rotating Microwave Sub-Systems
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