Cobham Antenna Systems

Antenna capabilities and solutions

The most important thing we build is trust

AIRBORNE
Tuned, low profile and conformal antennas

LAND
Ground-based, vehicle mounted and manpack antennas

SPECIALIST
High Performance custom designed antennas

ASSOCIATED TECHNOLOGIES
Direction Finding, Avionics, GPS, Jamming, TETRA

Cover image courtesy of AgustaWestland
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, LNA 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.
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. All of the companies within the Cobham group manage their development projects using a structured Life Cycle Management (LCM) framework to ensure the development is of the highest quality and efficiency. At Cobham Antenna Systems the development life cycle will include one or more of the following elements.

**Solution Conceptualisation**

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.

**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.

**Qualification and Certification**

Cobham’s equipment and systems are so highly dependent 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 MIL-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 (DAOS) 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 quality. Regardless of the manufacturing quantities, the products are built to the highest of standards.

**Production**

The antenna migrates to the main production area for series manufacturing. Cobham utilises modern techniques in production including cellular manufacturing with flexible production cells, each with highly skilled and experienced production personnel conforming to rigorous quality assurance procedures to ensure products are built to the highest of standards.

Regardless of the manufacturing quantities, the precise tolerances demanded by the aerospace and defence markets are most rigorously controlled. First compliance checks and function tests are conducted on every finished antenna to guarantee that they perform to the world leading standard that is expected from Cobham.

**Product Development Life Cycle**

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.

This comprehensive suite of tests verifies the high performance of Cobham’s products and gives the customer the satisfaction that their specification has been met.
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.

Conformal UHF SATCOM Antenna
The conformal UHF SATCOM antenna fitted in the nose cone in front of the cockpit of the McDonnell Douglas F15E Strike Eagle.

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.

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

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.

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.

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

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

Just some of the many platforms on which Cobham Antenna Systems antennas are utilised:

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

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

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

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

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

Infantry Programmes
- Bowman
- STARS V
- WIN-T
- Clansman
- M777
- Falcon
- JP2072
- Grintek

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The following capability brochures are also available by request:

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
Coaxial Cable Assemblies

For further information please contact:

Cobham Antenna Systems
The Cobham Centre
Fourth Avenue, Marlow
Buckinghamshire, SL7 1TF
England
Tel: +44 (0) 1628 472 072
Fax: +44 (0) 1628 482 255
E-mail: antennasystems.marlow.marketing@cobham.com

Cobham Antenna Systems
1955 Lakeway Drive
Suite 200
Lewisville
TX 75057
USA
Tel: +1 972 221 1783
Fax: +1 972 436 2716

www.cobham.com/antennasystems

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