Cobham Antenna Systems

Microwave Antennas

Specialist Antenna Design and Manufacture

Antennas for RADAR

The most important thing we build is trust

Man Pack Antennas

Antennas for Light Vehicles

Antennas for Armoured Vehicles

Antennas for Vehicles on Patrol

Radar

FMCW, Pulse and Reflectometer

Radar for secure peacekeeping

Radar Antennas

There are a wide variety of radar systems operating across the RF spectrum and they all work on the principle of a high power pulse or CW transmitted RF signal being reflected from the 'target' and usually being received by the same (or nearby) antenna.

Cobham Antenna Systems, Microwave Antennas has developed antennas for radar in Stripline and Waveguide for CW Doppler, FMCW, fixed beam pulse, and reflectometer arrays.

The antenna characteristics are critical to the system performance in order to resolve the target image.

Sophisticated modelling techniques combined with 20 years of experience in the design of microwave antennas will provide customers with an efficient, reliable antenna that meets their exact requirements. The company's near-field spherical anechoic test chamber supplies accurate patterns and 3-D images to demonstrate compliance with customers' specifications.

Application: Single panel, 28dBi gain antenna used in the X-Band CW Doppler Radar System

BAE Systems commissioned Cobham Antenna Systems, Microwave Antennas to develop a series of high specification directional antennas as part of the receive and transmit antenna system for their CW Doppler Radar system.

The radar system architecture uses commercial components to provide improvements in operation, simplifying logistics support and minimizing life cycle costs. This system was provided to the UK Aberporth Test and Evaluation Range, operated by QinetiQ on behalf of the UK Ministry of Defence and has been supplied to other Test Ranges.

The equipment comprises high gain directional transmit and receive antennas, each of which is made up of 16 directional 28dBi gain panel (sub-array) antennas designed and manufactured by Cobham Antenna Systems.

By using an array of phase-matched antennas that are suitably spaced apart, and by controlling the power and phase to each antenna element, the final beam shape can be controlled by the operator to provide greatest system flexibility.

Panel antennas for CW Doppler Radar System, as front cover

Radar

FMCW, Pulse and Reflectometer

Small Aperture X-Band Radar

Cobham Antenna Systems has developed an all printed circuit (PCB), 30dBi gain X-band antenna.

The benefits of the use of PCBs are that the weight can be less than the traditional parabolic dish, and have a wider bandwidth than the equivalent waveguide-based structures.

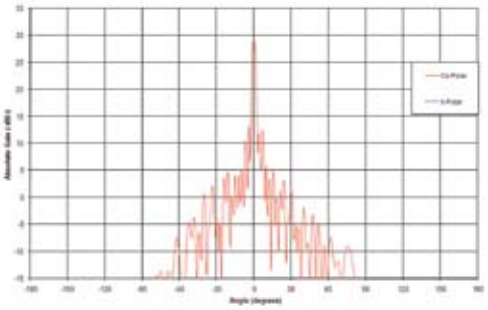
A full corporate feed network allows control of phase and amplitude at each patch element to ensure that the -29dB sidelobes are maintained over the entire band.

The use of a multi-layer PCB allows the radiating elements to be separated from the feed network, ensuring high level cross polar and sidelobe performance.

For higher gains and higher powers, Cobham Antenna Systems is designing hybrid waveguide-PCB flat panel antennas which provide the benefits of PCB-based antennas, but without the associated inefficiencies.

X-band panel antenna, 30dBi high gain, horizontal polarisation.

Flat panel antenna azimuth pattern shows 2.5˚ beamwidth and very low sidelobes



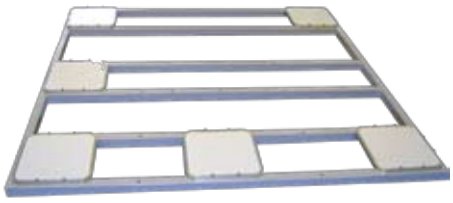
High Speed Target Acquisition and Tracking System

MARK Resources based in Torrance, California used a set of directional antennas developed by Cobham Antenna Systems, Microwave Antennas in precise arrangement mounted on a specially designed frame to meet the requirements for their new C-band radar system.

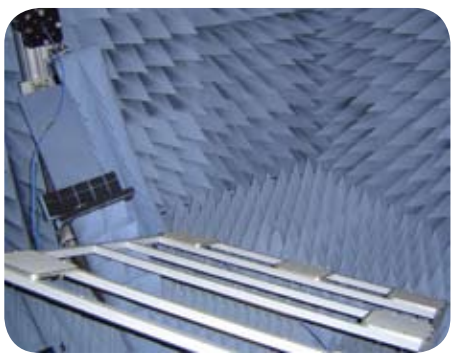
The High-Speed Target Acquisition and Tracking System radar (the HSTAT system) was developed by MARK Resources under the SBIR program with the US Air Force. It is designed to image and track multiple clustered objects.

As part of the brief, Cobham Antenna Systems, designed the antennas and frame to guarantee isolation of at least 70dB between the transmit antenna and all five receive antennas, to ensure that the radar met its performance specification. The company's on-site anechoic test chamber, which is normally used for precision spherical antenna pattern measurements, was utilised to demonstrate compliance to the high levels of isolation.

The directional flat panel, high gain antenna with vertical polarisation, used in the reflectometer array



Reflectometer array provided precision velocity measurement for munitions trials



The company's on-site anechoic test chamber which is normally used for precision spherical antenna pattern measurements, was utilised to ensure compliance to the high levels of isolation required.

Spherical Near-Field Testing

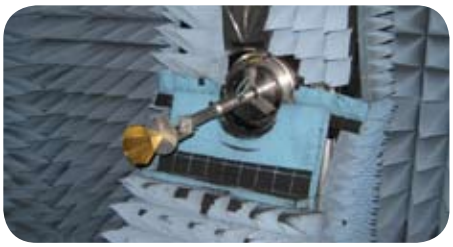
The on-site spherical near-field test facility is an example of our commitment to enhancing development facilities and technical support service to customers.

This facility provides 3-D radiation pattern data to verify specifications and to ensure compliance with stringent radiation pattern envelopes where necessary. The far field radiation pattern of the antenna can be calculated in any direction, in any polarisation, circular or linear, at any angle.

Operating within 0.4GHz to 40GHz, it has full dynamic range performance down to 0.8GHz, and sufficient sensitivity to test antennas in the lower frequency range.

Testing times depend on antenna size in wavelengths and the number of measurement frequencies. Gain and directivity measurements can be provided as well as phase. This allows for phase and amplitude matching batches of antennas which is necessary for Spiral antennas used in Direction-Finding systems.

An additional benefit of the spherical near field test facility is the ability to perform back projections on to a given plane within the measurement sphere which helps identify potential material defects. It also helps in the design process to determine if there is unwanted radiation off the feed circuit, which can be corrected at a very early stage, and the affects of coupling within a circuit that may otherwise cause amplitude or phase corruption within an array.



OTHER BROCHURES

Antenna Catalogue

Total Capability

Ground Control

Antenna Testing

Link16

IED Countermeasures

Unmanned Systems

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C-Band

Radar Systems

Cobham Antenna Systems, Microwave Antennas

M: Cobham Antenna Systems, Microwave Antennas
Lambda House, Cheveley, Newmarket, Suffolk CB8 9RG, UK
T: +44 (0)1638 732177
F: +44 (0)1638 731999
E: antennasystems.ma@cobham.com

European Antennas Limited trading as Cobham Antenna Systems, Microwave Antennas

Cobham Antenna Systems, Microwave Antennas - Radar Issue 1, 2010-08

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