

Cobham Antenna Systems

Microwave Antennas

MIMO Antennas

Multi-Beam, Dual Polarisation, Diversity

COBHAM

The most important thing we build is trust



Ground control
centre, fixed
and mobile



Critical
and efficient
communications



Control links
for robotics,
unmanned
vehicles and
target drones



Antennas used
worldwide on many
types of military
vehicle

About Cobham



Cobham Antenna Systems, Microwave Antennas

Cobham is constantly developing antennas for new and emerging markets and applications.

With more than 1500 antenna designs available, Cobham's flat panel, sector, omni, hemi omni and ultra wideband antennas are used in locations as diverse as Unmanned Systems, base stations, helicopters, aircraft, missiles, race cars, railway systems, TV cameras, weather buoys and satellites.

Cobham Antenna Systems, Microwave Antennas' production, development and test facilities are based in one UK location which ensures fast transition from design to production.

Antennas are supplied to some of the largest organisations and companies worldwide.

All antennas are tested throughout development to ensure they meet quoted specifications and comply with relevant legislation.

Environmental testing is carried out to recognised standards.

Engineering

Combining comprehensive knowledge and experience with the latest software design tools, Cobham's engineering team designs antennas to meet customer's specific requirements.

Sales

Cobham's experienced sales team has an understanding of many applications and markets which, combined with significant technical knowledge, ensures that customers are offered the most suitable antennas.

Antenna Development

Unique and individual development programmes are undertaken for customers in order to meet specific needs.

Catalogue

A full antenna catalogue is available which includes high gain directional, sector and collinear omnis; ultra wideband spirals; multi-octave bicones and many more in various off-the-shelf designs.

MIMO Definition

MIMO is the use of multiple antennas at either the transmitter or receiver, or both, to improve communication performance. In order to achieve optimum performance both the transmitter and receiver must support MIMO.

The behaviour of radio waves means they often arrive at the receive antenna at different points, levels, polarisations, timing and angles. This is known as multipath and is due to the path the waves take and objects they encounter between transmitter and receiver.

MIMO systems take advantage of multipath transmissions by combining the various signals received at different parts of the receive antennas.

MIMO has become an important part of modern and efficient wireless communication and helps to minimise the risk of drop out due to a weak RF signal, especially in non-line-of-sight (NLOS) scenarios.

The MIMO protocols require multiple antennas which usually provide the same coverage area whether directional, sector or omni-directional.

Transmissions are distributed over several antennas to achieve improved gain, efficiency and link reliability (reduced fading).

Traditionally, the additional benefits of MIMO have been achieved using multiple antennas spaced several wavelengths apart (space diversity), but it has been found that similar results can be achieved using dual-polarisation with +/-45degree or Vertical and Horizontal polarisations.

Product Overview



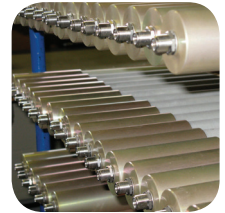
Key Features of Cobham MIMO Antennas

To provide the greatest benefit to the customer the majority of Cobham's MIMO antennas take advantage of 'polarisation diversity'. This means using orthogonal polarisations within the same aperture, either Vertical and Horizontal or $\pm 45^\circ$ polarisations.

This avoids the need for multiple units placed a number of wavelengths apart and results in compact antenna units which are highly efficient.

This allows for significant increases in data throughput without requiring additional bandwidth and provides cost savings in antenna installation.

- Increased diversity-gain using dual-polarisation
- Space-efficient antennas
- Polarisation diversity (vertical and horizontal, $\pm 45^\circ$ dual-slant or right and left circular)
- Greater coverage using multiple sector antennas in conjunction with higher order MIMO systems (e.g. 4 x 4)
- Minimise signal drop-out for a moving source



Cobham's MIMO Antennas:

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MIMO Antennas

Group 1 Antennas, 0.4GHz to 1GHz

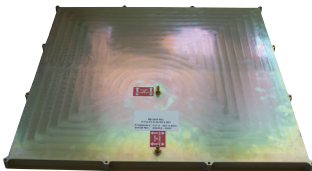


Group 1 Antennas, up to 1GHz

DIRECTIONAL

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA13-0.9VH/1387	0.86 - 0.91	13.4	39	38	Dual V&H	480x480x11	SMA(F) x2	•

FPA13-0.9VH/1387



DIRECTIONAL - MULTI-FREQUENCY

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
LPA7-TRI-DS2450-DS5500/1090	0.88 - 0.96	7	60	60	Vertical	339x225x42	SMA(F) x7	•
	1.71 - 1.88				Vertical			
	1.92 - 2.175				Vertical			
	2.40 - 2.50				Dual ±45°			
	5.25 - 5.85				Dual ±45°			

LPA7-TRI-DS2450-DS5500/1090



MIMO Antennas

Group 2 Antennas, 1GHz to 2GHz

Group 2 Antennas, 1GHz to 2GHz

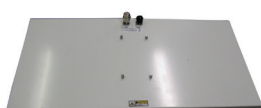
DIRECTIONAL

Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Size	Connector mm	Photo
			Az	El				
LPA7-1250VH/247	1.20 - 1.30	2 x 7	80	80	Dual V&H	23x158 dia	SMA(F) x2	
LPA7-1475RL/1254	1.45 - 1.49	8.5	70	60	Dual Circular	220x160x20	N(F) x2	
FPA13-16RL/1089	1.45 - 1.66	11@1.45, 13@1.525	35	35	Dual Circular	300x300x11	SMA(F) x2	•
LPA7-16RL/1311	1.52 - 1.66	8	70	70	Dual Circular	172x172x18	SMA(F) x2	

FPA13-16RL/1089



FPA17-16RL/1096



FPA8-1.6RL/1563



FPA7-2.0DS/1652

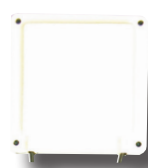


DLPA7-2050-DS45/1107



Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
			Az	El				
FPA8-1.6RL/1563	1.525 - 1.6605	7	67	65	Dual Circular	22x132 dia	N(F) x2	•
FPA7-2.0DS/1652	1.92 - 2.17	7.5	65	65	Dual ±45°	99x99x15	SMA(M) 90° 0.3m cable x2	•
DLPA7-2050-DS45/1107	1.92 - 2.175	7.5	65	65	Dual ±45°	100x100x9	SMA(M) 90° x2	•
FPA7-2.0DS/1750	1.92 - 2.175	6	65	65	Dual ±45°	99x99x15	QMA x2	•
FPA7-2.0DS/1824	1.92 - 2.175	6	65	65	Dual ±45°	99x99x15	QMA 90° x2	•
FPA7-2.0DS/1825	1.92 - 2.175	6	65	65	Dual ±45°	99x99x15	QMA x2	•

FPA7-2.0DS/1750



FPA7-2.0DS/1824



HOA3-1.5RL/1436



SA11-1.4DS/2017



SA17-18DS-45/345



HEMI-OMNI

Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
			Az	El				
HOA2-15RL/980	1.45 - 1.50	4	360	150	Dual Circular	79x100 dia	SMA(F) x2	
HOA3-1.5RL/1436	1.52 - 1.56	2.5	360	180	Dual Circular	86x108 dia inc flange	N(F) x2	•

SECTOR

Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
			Az	El				
SA11-1.4DS/2017	1.39 - 1.492	11	65	35	Dual ±45°	400x210x26	N(M) 205mm cables x2	•
SA17-18DS-45/345	1.71 - 1.88	16.5	65	8	Dual ±45°	1100x200x15	716(F) x2	•
SA16-18-DS45/973	1.71 - 1.88	15	70	9	Dual ±45°	1053x126x	716(F) x2	

MIMO Antennas

Group 3 Antennas, 2GHz to 3GHz

Group 3 Antennas, 2GHz to 3GHz

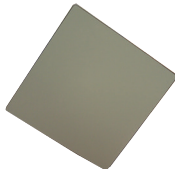
DIRECTIONAL

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size	Connector mm	Photo
	GHz		Az	El				
FPA13-21VH/1094	2.00 - 2.25	13	32	32	Dual V&H	242x242x16	SMA(F) x2	•
FPA13-21VH/1309	2.00 - 2.25	13	32	32	Dual V&H	242x242x19	N(F) x2	•
FPA18-22VH/1156	2.10 - 2.30	18	16	16	Dual V&H	480x480x11	SMA(F) x2	
FPA13-22VH/1218	2.10 - 2.30	14	30	30	Dual V&H	225x225x13	SMA(F) x2	
FPA13-22VH/1449	2.10 - 2.30	14	30	30	Dual V&H	225x225x13	SMA(F) x2	

FPA13-21VH/1094



FPA13-21VH/1309



FPA21-2.2VH/1996



FPA13-24VH-D1/125



PA3-2460-DS45/860



DLPA6-2.5-5.5DS/1314



Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA19-2.2VH/1995	2.20 - 2.40	19	18	18	Dual V&H	457x457x15	N(F) x2	
FPA21-2.2VH/1996	2.20 - 2.40	21	18	9	Dual V&H	762x457x15	N(F) x2	•
FPA13-24VH-D1/125	2.35 - 2.55	13	40	40	Dual V&H	159x159x12	SMA(F) x2	•
FPA13-24VH-D2/433	2.35 - 2.55	13	40	40	Dual V&H	159x159x12	SMA(F) x2	
PA3-2460-DS45/860	2.40 - 2.48	3	67	67	Dual ±45°	22x132 dia	RPBNC 4m cable x2	•
DLPA6-2.5-5.5DS/1314	2.40 - 2.50							
	5.15 - 5.85	8	60	60	Dual ±45°	55x161 dia	N(M) 0.5m cable x4	•
DLPA7-2.5-5.5DS/1315	2.40 - 2.50							
	5.15 - 5.85	7	60	60	Dual ±45°	37x132 dia	SMA(F) x4	•
DLPA6-2.5-5.5DS /1722	2.40 - 2.50							
	5.15 - 5.85	7	60	60	Dual ±45°	55x161 dia	N(M) 1m cable x4	
DLPA7-X-24RL/189	2.40 - 2.65	7	90	90	Dual Circular	30x97 dia	N(F) x2	•
PA3-2460-DS45/649	2.42 - 2.48	3	67	67	Dual ±45°	22x132 dia	RPBNC 2m cable x2	
PA6-2460-DS45/650	2.42 - 2.48	6	67	67	Dual ±45°	22x132 dia	RPBNC 1m cable x2	
PA6-2460-DS45-D1/1021	2.42 - 2.48	6	67	67	Dual ±45°	22x132 dia	RPBNC 1m cable x2	•
PA6-2460-DS45/1364	2.42 - 2.48	6	67	67	Dual ±45°	22x133 dia	RP SMA(M) 1m cable x2	
FPA19-26VH/641	2.50 - 2.70	18	20	20	Dual V&H	300x300x11	SMA(F)	

DLPA7-2.5-5.5DS/1315



DLPA7-X-24RL/189



PA6-2460-DS45-D1/1021



MIMO Antennas

Group 3 Antennas, 2GHz to 3GHz



Group 3 Antennas, 2GHz to 3GHz

OMNI

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
DSO3-2460-502-D1/871	2.40 - 2.50	1	360	90	Dual $\pm 45^\circ$	163x75 dia	RPBNC 1m cable x2	•
OA3-2.5DS/1855-A	2.40 - 2.50	1.5	360	90	Dual $\pm 45^\circ$	164x81 dia	N(F) x2	
OA3-2.5DS/1909-A	2.40 - 2.50	1.5	360	90	Dual $\pm 45^\circ$	91x75 dia	RP TNC x2 0.5m cable	
DSO3-2460-502/510	2.40 - 2.50	1.5	360	90	Dual $\pm 45^\circ$	163x75 dia	RPTNC 0.5m cable x2	•
DSO3-2460-502-D4/1048	2.40 - 2.50	1.5	360	90	Dual $\pm 45^\circ$	163x75 dia	RPBNC 0.5m LSHJ cable x2	•
DSO3-2460-502/1363	2.40 - 2.50	1.5	360	90	Dual $\pm 45^\circ$	163x75 dia	SMA(M) RP 0.5m cable x2 DSO3-	
DVOA7-2450-DT/1014	2.40 - 2.50	7	360	20	Vertical	848x60 dia	N(F) x2	

OMNI - MULTI-FREQUENCY

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
OA3-2.4-5.4DS/1785	2.40 - 2.50	0	n/a	n/a	Dual $\pm 45^\circ$	93x100 dia	RPBNC(M) (2.4) x2	
	5.15 - 5.725						RPSMA(M) x2, 1m cables x4	
OA3-2.4-5.4DS/1833	2.40 - 2.50	0	360	70	Dual $\pm 45^\circ$	93x100 dia	RP SMA(M) 1m cable x4	•
	5.15 - 5.725							
DSO3-24-54/1177	2.40 - 2.50	0	n/a	n/a	Dual $\pm 45^\circ$	93x100 dia 4x4"	SMA(F) x4	•
	5.15 - 5.725							
DSO3-24-54/1490	2.40 - 2.50	0	360	80	Dual $\pm 45^\circ$	93x100 dia	SMA(F) x4	
	5.15 - 5.725							
DSO3-24-54/1491	2.40 - 2.50	0	360	70	Dual $\pm 45^\circ$	93x100 dia	SMA(F) x4	
	5.15 - 5.725							

OMNI - BLADE

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
SBA-2.4DS/1979-A	2.30 - 2.40	1	360	-	Dual $\pm 45^\circ$	125x58x2	QMA 90° x2	•

DSO3-2460-502-D1/871



DSO3-2460-502/510



DSO3-2460-502-D4/1048



OA3-2.4-5.4DS/1833



DSO3-24-54/1177



SBA-2.4DS/1979



SECTOR

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
DSA16-26VH/640	2.50 - 2.70	15.5	60	10	Dual V+H	652x250x10	N(F) x4	
SA13-2370-DS45/867	2.28 - 2.46	13	70	20	Dual $\pm 45^\circ$	330x88x13	SMA(F) x 2	
SA12-2.5DS/1915	2.30 - 2.70	12	63	21	Dual $\pm 45^\circ$	399x140x14	N(M) 0.75m cable x2	
SA16-60-2.5VH/9223	2.30 - 2.70	16	60	9	Dual V+H	991x300x53	N(F) x2	
SA15-90-2.5VH/9224	2.30 - 2.70	15	90	9	Dual V+H	991x300x53	N(F) x2	
SA14-120-2.5VH/9225	2.30 - 2.70	14	120	9	Dual V+H	991x300x53	N(F) x2	
SA17-60-26-DS45-DT4/1029	2.50 - 2.70	17	60	6	Dual $\pm 45^\circ$	1135x113x12	N(F) x2	

MIMO Antennas

Group 4 Antennas, 3GHz to 4GHz

Group 4 Antennas, 3GHz to 4GHz

DIRECTIONAL

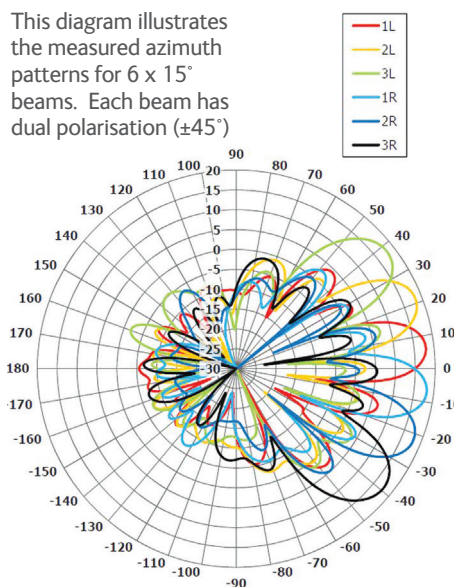
Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA13-35VH-D2/424	3.40 - 3.50	13	40	40	Dual V&H	159x159x10	SMA(F) x2	
MBA6-3.5DS45/2045-B	3.40 - 3.60	17	15	9	Dual $\pm 45^\circ$	620x441x70	N(F) x12	•
SBA-3.6DS/1992	3.60 - 3.70	1	360	-	Dual $\pm 45^\circ$	125x58x2	QMA 90° x2	

MBA6-3.5DS45/2045

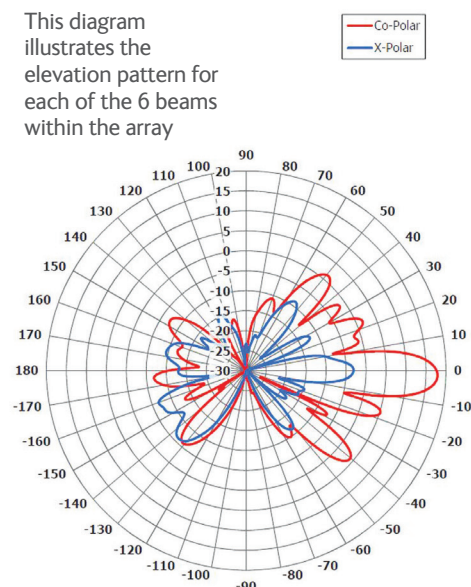
Multi-Beam Hub Base Station Antenna for ultra fast MIMO, MBA6-3.5DS45/2045 has six individual narrow beam patterns, each with a half power beamwidth of 15° .



This diagram illustrates the measured azimuth patterns for $6 \times 15^\circ$ beams. Each beam has dual polarisation ($\pm 45^\circ$)



This diagram illustrates the elevation pattern for each of the 6 beams within the array



SECTOR

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
SA13-3.5DS/1916	3.30 - 3.80	11.5	65	22	Dual $\pm 45^\circ$	399x140x14	N(M) 0.75m cables x2	
SA16-60-3.5VH/9343	3.30 - 3.80	15.9	57	8.5	Dual V&H	650x200x42	N(F) x2	
SA15-90-3.5VH/9344	3.30 - 3.80	15	90	8	Dual V&H	600x200x50	N(F) x2	
SA14-120-3.5VH/9345	3.30 - 3.80	13.5	117	8.5	Dual V&H	650x200x50	N(F) x2	

MIMO Antennas

Group 5 Antennas, 4GHz to 6GHz

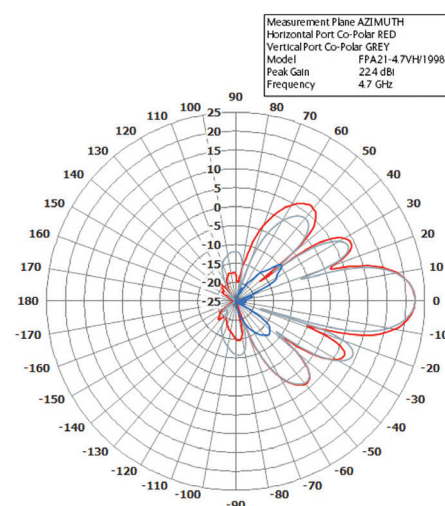
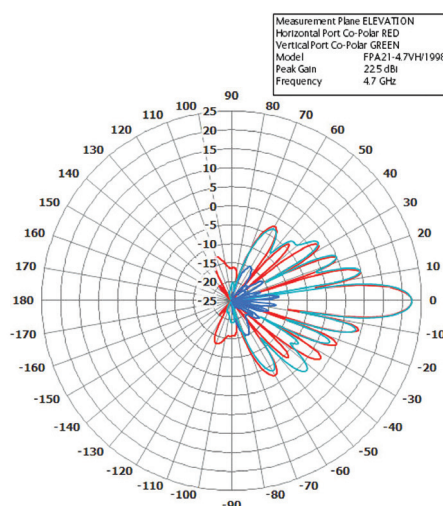
Group 5 Antennas, 4GHz to 6GHz

DIRECTIONAL

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA18-4.7VH/1997	4.40 - 5.00	18	17	17	Dual V&H	280x280x15	N(F) x2	
FPA21-4.7VH/1998	4.40 - 5.00	21.5	17	9	Dual V&H	457x280x15	N(F) x2	•
FPA24-4.7VH/1999	4.40 - 5.00	23.5	9	9	Dual V&H	468x468x14	N(F) x2	

FPA21-4.7VH/1998

High gain, directional antenna for MIMO. The radiation patterns illustrated demonstrate the close matching of azimuth and elevation patterns in both Vertical and Horizontal Ports.



DIRECTIONAL (Contd.)

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA19-55VH/490	5.20 - 5.82	18	20	20	Dual V&H	193x193x9	SMA(F) x2	
FPA19-55VH-D2/516	5.20 - 5.82	17	20	20	Dual V&H	212x212x4	SMA(M) 0.153m & 0.18m cables	
FPA23-55VH-AB/809	5.20 - 5.825	22.5	8	8	Dual V&H	353x335x5	SMA(M) 90° cable x2	
FPA23-61VH/1072	5.80 - 6.40	23.5	7	7	Dual V&H	380x380x17	SMA(F) x2	

OMNI

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
OA4-VH-5850/1247	5.72 - 5.85	4	360	40	Dual V&H	340x108 dia	N(F) x2	

SECTOR

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
SA11-5.1DS/2016	4.90 - 5.35	11	65	22	Dual ±45°	399x140x14	N(M) x2 0.75m cable	
SA19-30-5.1DS/1616	5.00 - 5.15	19	35	6.6	Dual ±45°	650x200x101	N(F) x2	
DSA16-55VH/642	5.20 - 5.80	15	55H, 65V	10	Dual V&H	380x151x10	N(F) x4	
SA15-58VH/1150	5.72 - 5.85	15.8	55	10	Dual V&H	330x130x7	TNC(F) x2	
SA17-60-5.4VH/9520	4.90 - 5.90	17	60	5.8	Dual V&H	650x200x42	N(M) x2	
SA16-90-5.4VH/9521	4.90 - 5.90	16	90	5.1 - 6.5	Dual V&H	600x200x42	N(M) x2	
SA15-120-5.4VH/9522	4.90 - 5.90	15	106	5.8	Dual V&H	650x200x42	N(M) x2	

MIMO Antennas

Group 6 Antennas, 6GHz and above

Group 6 Antennas, 6GHz and over

DIRECTIONAL

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
FPA13-70VH/397	6.75 - 7.25	13	40	40	Dual V&H	83x83x9	SMA(F) x2	
FPA13-9550VH-D1/213	9.00 - 10.00	13	40	40	Dual V&H	76x76x8	SMA(F) x2	

OMNI

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
OAS-11.2VH/1968	10.7 - 11.7	5	360	18	Dual V&H	435x76 dia	SMA(F) x2	
XPO5-112VH/1122	10.70 - 11.70	5	360	18	Dual V&H	435x38 dia	SMA(F) x2	•
XPO5-122VH/1155	11.70 - 12.75	5	360	18	Dual V&H	425x38 dia	SMA(F) x2	•

SECTOR

Part Number	Frequency	Gain dBi	Beamwidth		Polarisation	Size mm	Connector	Photo
	GHz		Az	El				
SA17-60-112VH/992	10.70 - 11.70	17	60	5	Dual V&H	650x80x65	SMA(F) x2	•
SA17-60-122VH/1123	11.70 - 12.75	17.75	60	4	Dual V&H	650x80x64	SMA(F) x2	

XPO5-112VH/1122



XPO5-122VH/1155



SA17-60-112VH/992



Spherical Near-Field Testing



Spherical Near-Field Testing

Cobham Antenna System's on-site spherical near-field test facility is an example of the company's commitment to enhancing development facilities and technical support service to customers.

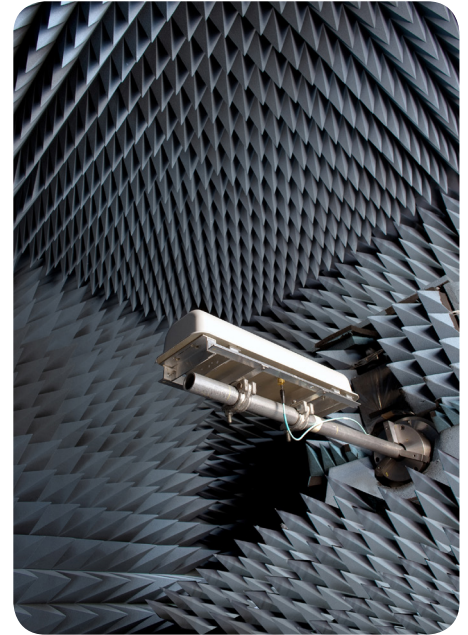
This facility provides 3D radiation pattern data to verify antenna specifications have been met and to ensure compliance with stringent radiation pattern envelopes where necessary. The far field radiation pattern of the antenna can be calculated in any direction, in any polarisation, circular or linear,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

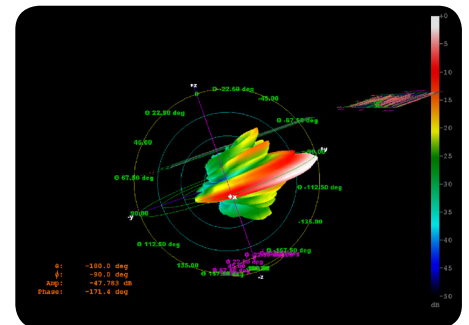
Testing times depend on antenna size in wavelengths and the number of measurement frequencies. Gain and directivity measurements can be provided as well as phase. This allows for phase and amplitude matching batches of antennas which is necessary for Spiral antennas used in Direction-Finding systems.

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.



Antenna in test chamber



3D pattern for sector antenna

BROCHURES



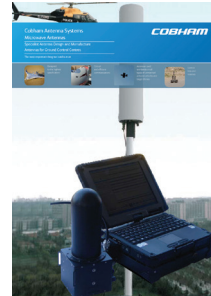
2012 Catalogue



Total Capability



Multi-Beam Antenna Technology



Ground Control



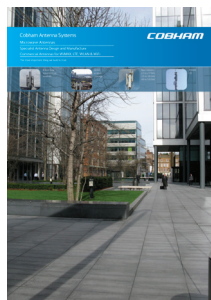
Electronic Warfare



Body Worn



Link16



WiMAX and LTE



Unmanned Systems



C-Band



Radar Systems



DAS



Chelton Limited trading as Cobham Antenna Systems

Cobham Antenna Systems - MMO Antennas, 2013-11

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