



Cobham Antenna Systems

Microwave Antennas

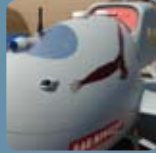
COBHAM

Specialist Antenna Design and Manufacture
Antennas for Ground Control Centres

The most important thing we build is trust



Designed to the highest specification



Critical and efficient communications



Antennas used worldwide on all types of unmanned airborne vehicles and target drones



Control links and robotics



Ground Control Centre Antennas
 Airborne Platforms, UAVs, Ground Vehicles, Robots
 Sector, Multi Sector and Omni Antennas



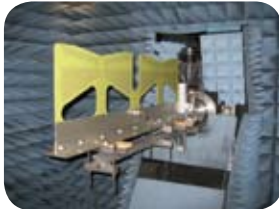
Unmanned helicopter

Sector

- Azimuth coverage from 30° to 210°
- Gain up to 20dBi
- Null-fill, electrical tilt and sidelobe suppression available

Sector antennas provide wide area coverage for military and security base station applications. They have clearly defined, wide, azimuth coverage, 30° to 210° in the horizontal plane with narrow elevation profiled vertical coverage.

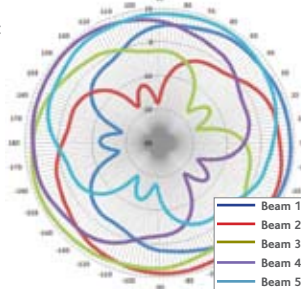
SA7-150-0.36V/1572 sector under test during development



Multi Sector

Multi Sector arrays - a multiple beam antenna in one housing - provide high gain wide area (up to 360°) and overhead coverage if required.

MSA6-2.4V/1795: sector azimuth patterns show 9dBi peak gain, 120° beamwidth and high level of overlap



Omni-Directional

- Robust construction
- High gain, up to 10dBi
- Polarisation - circular or linear

An omni antenna radiates 360° in the horizontal plane with peak gain on or close to the horizon. All of our omnis are centre-fed making them ground-plane independent with stable radiation patterns across the band. High gain collinear omnis can be produced by stacking and feeding more elements. Sidelobes can be controlled and the elevation beam can be shaped to provide other features such as null-fill or electrical tilt. Collinear antennas are light weight with rigid glass fibre radomes and aluminium spigots for stable mounting.

Sector Antennas

Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Dimensions mm	Connector	Photo +
			Azimuth*	Elevation*				
SA7-150-0.36V/1572	0.34 - 0.37	6	173	35	Vertical	1090x386x3	N(F)	above
SA13-60-0.9V/1462	0.90 - 0.93	13	73	16.5	Vertical	560x250x30	N(F)	+
SA11-120-1.3V/1384	1.15 - 1.40	11	120	16	Vertical	870x95.6 Ø	N(F)	+
SA9-120-1.3V/1445	1.20 - 1.45	9	120	36	Vertical	490x95.6 Ø	N(M)	+
SA17-18V/417	1.71 - 1.88	17	70	9	Vertical	1204x140x21	N(F)	
SA16-19V/230	1.85 - 1.99	16	75	10	Vertical	782x150x20	N(F)	+
SA17-22V/555	2.00 - 2.30	17	65	8	Vertical	1140x150x14	N(F)	+
SA12-110-2.4V/1480	2.00 - 2.70	12	112	17	Vertical	569x79 Ø	TNC(F)	+

SA13-60-0.9V/1462	SA11-120-1.3V/1384	SA9-120-1.3V/1445	SA16-19V/230	SA17-22V/555	SA12-110-2.4V/1480
SA16-60-25V/858	SA16-60-35V/579	SA17-60-4.7V/1419	FPA10-4.7R/1564	SA17-13R/1077	

SA16-60-25V/858	SA16-60-35V/579	SA17-60-4.7V/1419	FPA10-4.7R/1564	SA17-13R/1077

Sector, Multi Sector and Omni Antennas

Cranfield Aerospace prototype Boeing X-48B Blended Wing Body UAV, feature blade antennas



Multi Sector Antennas

Part Number	Frequency GHz	Gain dBi	Beamwidth		Polarisation	Dimensions mm	Connector	Photo
			Azimuth*	Elevation*				+
MSA5-1400/1131	1.31 - 1.43	12 sector 6.5 o/head	88 57	19 56	Vertical Right Circular	743x197 Ø	N(F)	
MSA6-2.4V/1795	2.00 - 2.70	8 sector 7 o/head	110	36	Vertical Right Circular	300x155 Ø	SMA(F) x6	+
MSA7-16-2350R/829	2.30 - 2.40	14 sector 6.5 o/head	70 60	10 53	Right Circular	812x231 Ø	N(F)	+
MSA5-10-24R/389	2.30 - 2.50	10 sector 6 o/head	90 90	40 90	Right Circular	210x140 Ø	SMA(F) x5	
MSA4-24R/199	2.30 - 2.50	13	90	20	Right Circular	606x156 Ø	N(F)	+
MSA5-24L-ECS/1293	2.30 - 2.50	13 sector 7 o/head	90 80	20 80	Left Circular	582x156 Ø	N/a	
MSA5-24R/223	2.30 - 2.50	13 sector 7 o/head	80 80	20 80	Right Circular	706x156 Ø	N(F)	
MSA5-26L/117	2.48 - 2.68	13 sector 7 o/head	90 80	20 80	Left Circular	706x156 Ø	N(F)	
MSA5-3.3L/1407	3.20 - 3.40	12.5 sector 8 o/head	68 64	16.7 62	Left Circular	582x156 Ø	N/a	

MSA6-2.4V/1795



MSA7-16R-2350R/829 with 6 sectors and one overhead



MSA4-24R/199



MSA5-3.4V/1435	3.35 - 3.55	13	80	16.5	Vertical	482x162 Ø	SMA(F) x5	
MSA7-16-35R/497	3.40 - 3.50	15 sector 7 o/head	70 70	10 60	Right Circular	681x158 Ø	N(F)	+
MSA5-34L/963	3.40 - 3.60	13 sector 7 o/head	80 80	20 80	Left Circular	606x156 Ø	N(F)	
MSA5-34R-ECS/374	3.40 - 3.60	13 sector 7 o/head	80 80	20 80	Right Circular	706x156 Ø	N(F)	+
MSA6-15-46L/879	4.40 - 4.80	15 sector 8.5 o/head	70 60	8.4 55	Left Circular	527x158 Ø	N(F)	+
MSA6-4.7V/1484	4.40 - 5.00	15 sector 8 o/head	70 70	8 65	Vertical Right Circular	627x162 Ø	N(F)	
MSA6-90-4.7V/1554	4.40 - 5.00	13.8 sector 8 o/head	90 70	8 65	Vertical Right Circular	627x162 Ø	N(F)	
MSA10-HEX-105V/250	10.30 - 10.80	10	80	40	Vertical	50x60 Ø	SMA(M) x6	+

MSA7-16-35R/497



MSA5-34R-ECS/374



MSA6-15-46L/879









MSA10-HEX-105V/250





Omni Antennas

Part Number	Frequency GHz	Gain dBi	Beamwidth Azimuth* Elevation*	Polarisation	Dimensions mm	Connector	Photo +
OA4-0.9V/1520	0.87 - 0.96	4.5	360 45	Vertical	605x57 Ø	N(F)	
OA8-1.4V/1251	1.35 - 1.525	9	360 12.6	Vertical	1208x57 Ø	N(F)	
OA6-1.44V/1508	1.43 - 1.45	7	360 19.5	Vertical	858x57 Ø	N(F)	+
VOA10-1615/897	1.59 - 1.64	9	360 10	Vertical	1225x57 Ø	N(F)	+
VOA10-1800/111	1.70 - 1.88	10	360 10	Vertical	1255x57 Ø	N(F)	+
OA4-1.8V/1641	1.71 - 1.88	4.4	360 38	Vertical	391x51 Ø	QN(M)	+
VOA10-1900/232	1.85 - 1.95	10	360 10	Vertical	1250x57 Ø	N(F)	+
XV09-2150-D2/870	2.00 - 2.30	9	360 8	Vertical	1006x106 Ø	N(F)	

Part Number	Frequency GHz	Gain dBi	Beamwidth Azimuth* Elevation*	Polarisation	Dimensions mm	Connector	Photo +
OA6-1.44V/1508							
VOA10-1615/897							
VOA10-1800/111							
OA4-1.8V/1641							
VOA10-1900/232							
VOA10UT4- VOA4UT25- LPA5-2265/827	2.20 - 2.335	9.5 4 6	360 360 360	Vertical Vertical Right Circular		N(F) x3	
SVD2-2300/427	2.20 - 2.34	2	360 80	Vertical	103x11 Ø	SMA(M)	
OA2-2.4V/1392	2.25 - 4.00	2	360 65	Vertical	185x32 Ø	TNC(F)	above
LCO10-2350/720	2.27 - 2.43	10	360 10	Left Circular	800x104 Ø	N(F)	
VOA10-2340/459	2.28 - 2.38	10	360 10	Vertical	1008x57 Ø	N(F)	
OA4-2.5V/1542	2.28 - 2.70	4	360 40	Vertical	222x25 Ø	TNC(M)	+
OA10-2.4V/1655	2.30 - 2.55	9	360 13	Vertical	908x57 Ø	N(F)	+
VOA10-2450/177	2.40 - 2.50	10	360 80	Vertical	905x57 Ø	N(F)	+
RCO10-2460/255	2.40 - 2.55	10	360 10	Right Circular	891x104 Ø	N(F)	
VOA11-26/1095	2.50 - 2.70	10	360 10	Vertical	1133x31 Ø	716(F)	
XV010-3450/065	3.30 - 3.55	10	360 10	Vertical	600x95 Ø	N(F)	
RCO10-3500/931	3.40 - 3.60	9	360 12	Right Circular	647x85 Ø	N(F)	+
RCO10-3500-D1/1185	3.40 - 3.60	9	360 12	Right Circular	579x79 Ø	N(F)	
VOA7-36/1146	3.40 - 3.80	6	360 20	Vertical	356x31 Ø	N(F)	+
XV09-3880/944	3.70 - 4.06	9	360 7	Vertical	782x98 Ø	N(F)	
VOA9-45/1161	4.30 - 4.70	9	360 11	Vertical	550 x 31 Ø	N(F)	+
OA9-4.6V/1701	4.49 - 4.80	9	360 12	Vertical	600x36 Ø	N(F)	

Part Number	Frequency GHz	Gain dBi	Beamwidth Azimuth* Elevation*	Polarisation	Dimensions mm	Connector	Photo +
OA4-2.5V/1542							
OA10-2.4V/1655							
VOA10-2450/177							
RCO10-3500/931							
VOA7-36/1146							
VOA9-45/1161							

Sector, Multi Sector and Omni Antennas



Control and data links for robotics applications

Ground Control Centre Antennas

Cobham Antenna Systems, Microwave Antennas provides antennas for both control centre and remote platform.

The control centre antenna usually provides the higher gain part of the link and may be a medium to high gain omni antenna, medium gain sector or high gain directional antenna.

A directional antenna is likely to require a two-axis steering system. A less complex but compact multi-sector antenna array provides intermediate range coverage for communicating with a remote platform. This type of arrangement can be used for quick deployment, tactical applications.



Cobham Antenna Systems, Microwave Antennas has a range of multi-sector arrays.

A selection of suitable antennas is listed in this leaflet, with more available in our main catalogue. Contact us for assistance.

Unmanned Vehicle Antennas

Unmanned Systems (UMS) are providing an increasing number of operational functions including airborne and remote ground surveillance, video transmission, border patrol and tactical systems.

As the demand for Unmanned Systems increases, so does the need for antennas for payloads, data communications systems, command and control.

Cobham Antenna Systems, Microwave Antennas has a range of standard cost-effective, high performance antenna designs that are already used on Unmanned Systems.

Link Margin (Fly-By) Analysis

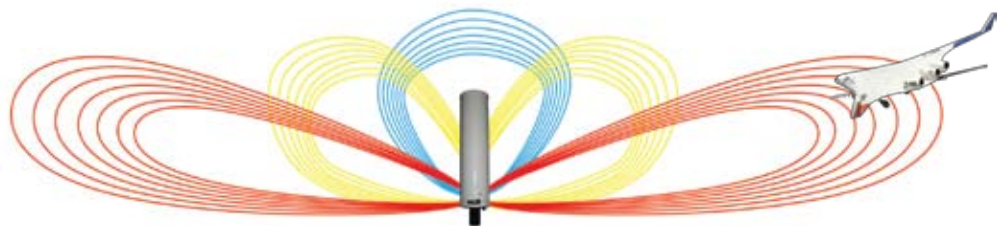
Link margin (fly-by) analyses can be performed for many airborne systems. The method is applicable to helicopter, unmanned airborne systems (UAS) and missile applications. These calculations are based upon real measured 3D antenna patterns, and can be used to assist in system planning. The region over which coverage is required is considered, and the path losses to points within the region are calculated. The gain of the antenna at the angle of each location is added to the path loss which provides data for plotting graphs of Relative Signal Strength vs. Range at different altitudes.

As the Cobham Antenna Systems library of measured antenna performance is so extensive, the optimum antenna combination can be considered for a given requirement. Such planning can assist in deciding when to use switched sector instead of omni-directional antennas, how many separate antennas to have provide elevation coverage, and whether or not to use an additional overhead antenna to ensure links are maintained for communication at high elevation angles.

The ideal antenna combination will vary according to the specifics of the requirement. Generally, a number of altitudes within the

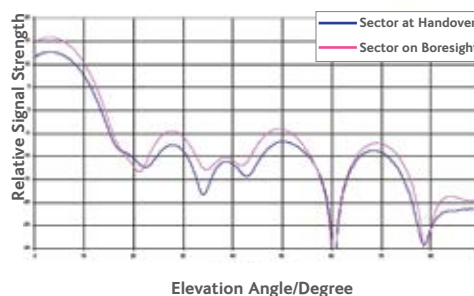
desired operational ceiling are considered, and link margins at all ranges within the required envelope are calculated at these altitudes. The worst case handover angle between sector antennas will be used, and any effects of

polarisation mismatch loss through antenna misalignment can be factored in.

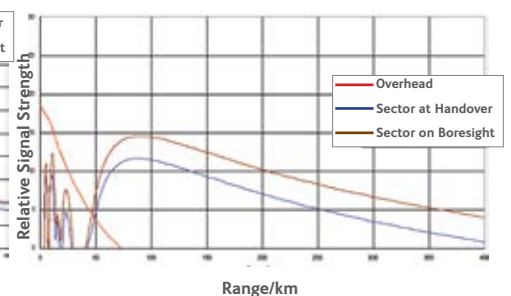


A single, multiple element antenna comprising several omni or omni and sectors can be designed to provide optimum coverage for a given operational requirement.

Typical Elevation Pattern of Sector Antenna used to Calculate Signal Strength



Calculated Output showing 40,000ft Altitude Signal Strength vs. Range





OTHER BROCHURES



Antenna Catalogue



Total Capability



Ground Control



Antenna Testing



Link 16



IED Countermeasures



Unmanned Systems



WiMAX and LTE



C-Band



Radar Systems

Cobham Antenna Systems

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