

Biography of Rob A Lewis



Rob Lewis is Group Leader in the Sensor Systems Department of BAE System's Advanced Technology Centre in Chelmsford, UK. The Group focuses on all aspects of electromagnetic engineering including antenna design, installed antenna performance prediction, radar cross-section control and technical consultancy. Applications include air, sea, land and space systems in both military and civil domains. He has over 25 years experience in microwave and antenna design and has published numerous papers and patents. His research interests include antennas for wideband, multifunction sensor systems.

He has served on the organising and technical committees for the EuCAP conference series, IET Technical Committees, LAPC Technical Committee and as Deputy-Chairman for a NATO investigation of naval antenna systems.

“Wideband Antenna Technology in Military Applications”

ABSTRACT: Wideband antennas are essential for military systems requiring spectrum-agility, novel radar modes or multi-functionality. However, the characteristics that are ‘wideband’ and the physical constraints differ in different systems.

High-performance radar or communication systems, particularly ‘shared aperture’ architectures, require wideband VSWR and radiation pattern characteristics. Some proposed multifunction phased arrays require multi-octave radiating elements capable of wide angle ($\pm 45\text{-}60^\circ$) beam scanning. The performance is critically dependent, not just on the radiating aperture, but the choice of technology used for signal distribution behind the aperture. Design of the host platform (e.g. aircraft / naval ship) is closely linked to the requirement to accommodate the sensor system.

In contrast, low / medium gain communication systems, particularly for mobile applications, require wideband VSWR but can tolerate some radiation pattern degradation. For communications applications ‘wideband’ might be ‘only’ 20-50%. Physical constraints are very different from those for phased arrays, with the focus on low-cost, lightweight solutions that operate in unpredictable environments. Body worn antennas are gaining prominence in a wide range of communications applications. When integrated into clothing antenna size is constrained by the dimensions of the human body.

Here we describe wideband antenna technologies for two military applications – phased array sensors and body-worn communications systems.

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