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Stretching the bandwidths

Original thinking at Birmingham has led to the development of a compact antenna for mobile devices, such as phones, laptops and PDAs, that will operate across a range of bandwidths.

A compact antenna for mobile devices that will operate across a range of bandwidths

What is it?

A reconfigurable antennae for wireless communications

How does it help?

- Space saving antenna applicable to current and future mobile communications technology. Antenna measures approx 45mmx5mmx7mm.
- Operates between 460MHz to >3GHz including penta-band cellular services, future cellular 4G services, Bluetooth, WiFi, etc
- Operates as wideband spectrum sensing antenna, or narrow band communication antenna.

Background

One of the key components within the mobile device is the antenna, which is an integral part of the device's industrial design. Devices these days require access to multiple wireless communication standards such as penta-band cellular services, and personal area networks such as Bluetooth, WiFi, etc. With growing popularity to connectivity in a highly mobile environment, more standards and services are being rolled out (such as Digital Video Broadcasting - Handheld (DVB-H), Long Term Evolution (LTE), Ultra-wideband (UWB) etc). As more and more services are available, more antennas and therefore space is required. This will have a direct impact on the form factor of the device.

This new antenna is very compact and fits into the majority of handsets currently available in the market. The antenna system operates in two modes, 'listening' (wideband) and 'application' (narrow band) mode. It consists of a reconfigurable single or dual feed port antenna system, where the frequency agility is from 460MHz to >3GHz. It has the potential to tune to higher frequency bands and this is currently under development. In addition, the antenna resonates from 694-960MHz, 1710-2180MHz, 2300-2400MHz, and 2500-2690MHz. This makes the antenna not only ready for current 2/3G networks but also for 4G networks such as LTE systems or WiMax systems.

Why the University of Birmingham?

- The Department of Electronic, Electrical and Computer Engineering attracts research grant and contract funding in excess £2 million per annum.
- In the 2008 Research Assessment Exercise, 85% of the Department's research was judged to be of international standing, with 60% internationally leading.
- Our research leads the field in many of the emerging disciplines of the 21st century. We have a clear vision for the future and a strong commitment to interdisciplinary research that challenges conventional thinking.

Who's behind it?

Peter Hall is Professor of Communications Engineering, leader of the Antennas and Applied Electromagnetics Laboratory, and Head of the Devices and Systems Research Centre in the Department of Electronic, Electrical and Computer Engineering at the University of Birmingham. He has researched extensively in the areas of microwave antennas and associated components and antenna measurements. He has published 5 books, over 340 learned papers and filed various patents.

What's next?

Contact: John Pearson

Email: patents@alta.bham.ac.uk

Telephone: +44 (0)121 414 8632

Fax: +44 (0)121 414 9040

University of Birmingham
Alta Innovations Ltd
Birmingham Research Park
Vincent Drive
Birmingham B15 2SQ
Tel: +44(0)121 414 9090
info@alta.bham.ac.uk
www.altabham.ac.uk