



In 1923, Captain PP Eckersley, the BBC's first chief engineer launched a new era in broadcasting at Daventry in the Midlands. The first years of radio had been a local affair, with individual stations established and transmitting programmes to individual cities across the country, from London to Glasgow. Eckersley saw things differently, aiming at total coverage of the UK from one transmitter- creating the first national radio station. What was needed was a powerful transmitter, and a spot in the centre of the country - Daventry. The greenfield site chosen was so central that within its grounds was an ancient Anglo Saxon oak supposed to mark the exact centre of England, the Daven Tree, hence Daventry.

The site was bought in 1924, and in July 1925 became home to the world's first high power low frequency broadcasting transmitter, officially known as Daventry 5XX, but dubbed the 'old gentleman' by its team of engineers. The enormous 26 kW transmitter was the size of a tennis court, and powered by two diesel generators each as big as a double decker bus.

From its first days, it reached 85% of the population, surpassing Eckersley's best hopes. Though within a few years, smaller transmitters were built across the country, most radio receivers had one mark on the dial simply reading 'Daventry'. Fame soon spread across the world when in the 1930's, foreign short wave transmissions began at the site. And for the engineers, this brought an unexpected benefit when they began to receive Christmas presents from listeners, such as tea from India and coffee from East Africa. If locals ever had an earth fault on their telephone system, they would hear the BBC Far Eastern Service in Malay or Thai when they picked up the phone.

The Daventry site also saw the birth of radar, after transmitters there were used to test if aircraft could be spotted by bouncing waves from them.

The transmitters were retired in March 1992 after 67 years of service. Most of the land where the antennas had stood was sold off, reverting to farmland or being used to build houses. The few remaining buildings were initially used for storage, before being sold to Crown Castle in 1997 when the BBC's transmitter sites were privatised.

HISTORY REPEATS ITSELF

History has a habit of repeating itself and running full circle. Consider the following:

WIDEBAND WIRELESS AND GRADE OF SERVICE

These long wave and short wave systems were a fine example of high power wireless, beautifully engineered with frequency synthesisers built into 19-inch racks standing taller than the engineers that built them. To achieve an 85% coverage was all the more remarkable given that Northants had (and still has) poor ground conductivity (the combination of sandstone and a low water table). Orfordness, set in

salt water was in later years to prove far more effective.

THE RELOCALISATION OF BROADCAST TRANSMISSION

From local transmission to national transmission back to local transmission, Daventry is now the site of a DAB broadcast transmitter supporting local radio and localised info casting and data casting.

THE REBIRTH OF SHORT WAVE (AND MEDIUM AND LONG WAVE) AND LONG DISTANCE HIGH POWER DIGITAL RADIO 'WIDEBAND' TRANSMISSION

Unlike the Voice of Russia, the BBC did not cut back on short wave transmission and over the years, listeners have been steadily increasing both in developing countries and amongst business users. In the late 1990's, The **Digital Radio Mondiale (DRM)** Consortium www.drm.org successfully lobbied for an international standard for digital AM for frequencies below 30 MHz. Digital AM is comparable to FM mono in terms of sound quality and can be broadcast with a footprint of 1000 miles from one transmitter. DRM can be used for a range of audio content, including multi-lingual speech and music and has the capacity to integrate data and text. The DRM signal is designed to fit in with the existing AM broadcast band plan, based on signals of 9 kHz or 10kHz bandwidth. It has modes requiring as little as 4.5kHz or 5kHz bandwidth but also includes modes that can take advantage of wider bandwidths, such as 18 or 20kHz with applications that include fixed and portable radios, car receivers, software receivers and PDAs. Remember that "wideband" is a relative term and 20 kHz bandwidths below 30 MHz are to all intents and purposes 'wideband' in terms of their application potential.

COFDM IN DRM

The DRM system uses COFDM with the number of sub carriers variable to suit channel allocations and required range (transmission resilience). There are three different types of audio coding. MPEG4 AAC audio coding is used as a general-purpose audio coder and provides the highest quality. MPEG4 CELP speech coding is used for high quality speech coding where there is no musical content. HVXC speech coding can be used to provide a very low bit-rate speech coder. DRM is therefore effectively a (very) wide area version of DAB and DMB and has now been fully ratified as an ETSI specification (the ETSI ES 201 980 V1.2.2 (2003/2004) DRM system specification and 101.968 V1.1.1 (2003-4) datacasting standard, In parallel, the ITU has ratified DRM for use in the medium wave AM and long wave frequency bands in Regions 1 and 3 (Europe, Africa, the Middle East, Asia and Australia/New Zealand).

RADAR AND UWB

And of course, radar was the precursor of UWB (Ultra Wide Band). It could be argued that the early spark transmitters used by Fessenden and Marconi represent the true genesis of wideband wireless but the idea of using short pulse transmission was perfected 50 years ago in radar applications and has provided much of the fundamental physical knowledge now being applied to low cost low power UWB (ultra wideband) transceivers (with much of the fundamental research work still being done in this country).

Acknowledgements

This article is based on material included in the BBC in house magazine Aerial (July

20th 2004), and on the personal childhood memories of Richard Lambley, Editor of Land Mobile Magazine. www.landmobile.co.uk. Richard was brought up in the shadow of the Daventry transmitter mast, which may explain (amongst other things) his lifelong interest in radio.



Captain PP Eckersley

Footnote

Before being appointed as the BBC's first engineer, the multi talented Peter Pendleton Eckersley had been the producer, writer, and presenter of the first experimental half-hour programme that the Marconi company was licensed to broadcast each week from a studio in a former army hut in Writtle near Chelmsford. The programme was launched 'on air' on St Valentine's Day, 1922. The Captain had a gift for improvising on microphone. He became Britain's first radio star with an instantly recognisable call sign "Two-Emma-Toc, Writtle testing."

<http://www.marconicalling.com/museum/html/people/people-i=17.html>

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