

THREE KINGS AND A QUEEN

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How broadcasting technology has shaped and changed the British Monarchy and British politics over the past ninety years

The idea for this short study came from the present popularity of '[The Kings Speech](#)', a film which has rightly received an array of awards but which has also raised public awareness of the impact of broadcasting technology on the British Royal Family and the British political system.

In the film, George V advises Bertie, the future George VI that he must overcome his stammer and learn to communicate – looking good on a horse is no longer enough for a King. His elder brother Edward is an accomplished public speaker who adapts to the new broadcast age with relative ease and assurance.

Edward inherits the throne and is crowned Edward VIII but is forced to abdicate because of his relationship with Wallace Simpson. Bertie seeks help from a sympathetic Australian speech therapist and goes on to make a number of effective war time broadcasts. The film stops there but of course the story continues.

This short paper traces the technology and related social changes that have occurred since 1922 and ends with a reference to the technology being used at William and Kate's wedding on April 29 2011 and the Queen's opening speech at the British Olympics on the 27th July 2012.

Over the past ninety years, Public Service Broadcasting has had a dominant role in shaping how others perceive the UK globally and how we see ourselves locally as a sovereign nation. In this respect technology change can be shown to be closely coupled with substantive shifts in present and future social and political ambitions and expectations. We argue that radio and TV are becoming more rather than less important over time as an agent of political and social change, a process that can be directly linked to technology innovation.

There is a substantial amount of information on this topic on the [BBC web site](#). As and when we have drawn on this as a resource we have provided a direct link to the original source URL. We would also like to thank the British Library and the BBC for permission to use the recordings of George V at the British Empire Exhibition.

We are however particularly indebted to the Science Museum for providing us with access to relevant documents and artefacts that help us to tell this story. The Science Museum has one of the most extensive collections of broadcast and radio artefacts to be found anywhere in

the world. Only a very small fraction of these objects are presently on permanent show to the public.

This will be substantially redressed when the new Treasury Gallery, The Making of Modern Communications opens to the public in 2014/2015. The purpose of the gallery is to inform and inspire a new generation of broadcast and radio engineers but the exhibits will also demonstrate that a study of the past can directly help us to develop a more integrated approach to broadcast technology strategy and its direct impact on social, economic and political progress.

The new gallery is however only partially funded and requires additional investment to realise its potential both as a research resource and source of inspiration.

If you would like to become more closely involved in this fund raising process either as an individual or on a corporate basis then do please [contact us](#).

Enabling component technologies

The British naturally consider they that they were first in the public service broadcasting race but so do the Americans and the French consider neither claim is credible.

It can be stated with certainty that the British Broadcasting Company was formed on 18th October 1922 with the Marconi Company as a prime contractor.

Broadcasting would however not have been technically or commercially feasible without the valve technology developed by Fleming, the diode valve and the triode valve developed by the American Lee de Forest, an amplifier and oscillator in one handy package.



[Fleming's diode valve](#)

Picture courtesy of the Science Museum/
SSPL10305262



[Lee de Forest's triode valve](#)

Picture courtesy of the Science Museum/
SSPL10324050

By 1920 two receiver architectures, direct conversion and the superhet were both understood in principle. The practical implementation of the superhet is usually credited to Edwin Armstrong and by the mid 1920s in the US most receivers used this technique.

Adoption in UK and Europe was slower and crystal sets remained popular for a number of years partly due to their low cost and partly due to the fact that they needed no battery, working off the power from the incoming radio signal – a neat trick to replicate in a modern mobile phone.

However a basic economic truth was established that it is relatively easy to build the transmission network and relatively difficult to design user equipment that can be manufactured at a low enough cost and high enough performance to encourage the mass market adoption needed to produce a return on investment – a scale performance conundrum that still dogs the industry today.

Enabling transmission technologies – the long wave to medium wave to short wave to VHF transition

On the transmission side [a medium wave transmitter designed by Captain Henry Round and Charles Franklin of Marconi's Wireless Telegraph Company](#) was brought into use in May 1922 located in an attic at Marconi House (close to Bush House) and using the call sign 2LO. The first broadcast from 2LO by the newly formed BBC was on November 14th.



The 2 LO transmitter as installed at Marconi House c1923, now stored in the Science Museum and proposed as a centrepiece for the new Making of Modern Communications gallery.

Picture courtesy of the Science Museum/SSPL and copyright of the Marconi Company.

It was 2LO that broadcast George V and Edward, the future Edward VIII from the Empire Exhibition at Wembley in 1924. George V's part of the speech was recorded by the Gramophone Company (HMV) in Hayes and possibly also Columbia and is an early example of electrical recording reproduced [here](#) courtesy of a WAV file provided from the British Library Sound Archives. (Used with the joint permission of the British Library and the BBC sound archive department). A year later Bertie was asked to perform the same duty – a torture graphically acted out in the film.

Microphones as an enabling technology

Stammer or no stammer these were high profile events and the corporation needed a compact microphone that could capture speech accurately. Captain Round led a design project with a

colleague, AJ Sykes, which resulted in the [Round Sykes Microphone](#) introduced in 1923. Over time microphones came to be optimised for studio or outdoor use – the most significant innovations being the [ribbon microphone](#) and the [lip microphone](#). Marconi-Reisz carbon microphones were a BBC standard from the late 1920s to the late 1930s. The BBC ribbon microphone became more common after 1936.

Fifteen years of pre war investment and innovation

The 2LO transmitter at Marconi House was replaced in 1925 with a new transmitter located in Selfridges in Oxford Street though kept in reserve until 1929 and a high power transmitter 5XX was installed in Daventry to provide country-wide reception from a single transmitter

In 1929 the BBC began transmissions from Brookmans Park, Hertfordshire, as the first stage in providing nationwide coverage of two alternative programmes on medium wave from a chain of high-power regional transmitters.

In 1925 John Logie Baird organized the first public demonstration of low-definition television though the technology was viewed with suspicion by BBC management.

Throughout the 1920s very few recordings were made of BBC broadcasts but in 1930 the BBC acquired a [Blattnerphone](#), designed by British film maker Louis Blattner that used 6mm steel tape spooling through the machine at 5 ft per second, a major safety hazard. The end result was a recording only adequate for voice. Direct disc recording on MSS machines was introduced later in the 1930s.

On the 22nd August 1932 experimental TV transmissions by the BBC started from a studio in Broadcasting House but more significantly short wave radio broadcasts started on the 19th December aimed at listeners cut off by “desert, snow and sea”.

On the 25th December [George V gave the first broadcast to the Empire](#) with a speech scripted by Rudyard Kipling.

In 1933 the Droitwich long wave transmitter replaced the Daventry 5XX equipment. On 2nd November 1936 the BBC started the world's first high definition television (405 line) service from Alexandra Place transmitting in VHF band 1 from 47 to 88 MHz.

Cameras and cables as enabling technologies

In 1937 the BBC started using [Marconi's Emitron camera](#). Three of these cameras were installed at Hyde Park corner to record the coronation of George VI in May 1937. The cameras were [connected via a lead sheathed copper cable to Alexandra Palace](#), a massive undertaking for an audience estimated as at most 10,000 people though the BBC were confident that the investment would eventually be worthwhile as the viewing audience increased .

The war and post war innovation

In [1939 George VI addressed the nation](#) on the outbreak of the Second World War.

TV and long wave radio broadcasting were both suspended during the war and medium wave was reconfigured to make it harder to use as a homing beacon for German bombing raids but radio technology developed at significant speed both in terms of component technology and manufacturing techniques including the first use of a printed circuit board.



[Radio with a printed circuit board 1942](#)

Picture courtesy of the Science Museum/SSPL 10439336

These war time advances provided the basis for a great leap forward in TV receiver technology in the immediate post war period. The Bakelite Bush 22 for example was introduced in 1952 and became a popular household item in time for the [Queen's Coronation](#) on June 2nd 1953.



[The Bakelite Bush TV22 introduced in 1952](#)

Picture courtesy of the Science Museum/SSPL 10307216

On the 10th October 1955 colour TV 405 line test transmissions started from Alexandra Palace and VHF FM broadcasting was introduced. On the 25th December 1957 the [Queen's Christmas broadcast](#) was televised for the first time.

Radio component technology was on the cusp of another revolution courtesy of the transistor. In November 1954 Industrial Development Engineering Associates of Indiana in partnership with Texas Instruments (TI) introduced the Regency TR-1, the world's first pocket transistor radio.

In 1958 the BBC experimentally introduced VERA, the [Vision Electronic Recording Apparatus](#) though it was soon replaced with [American Ampex equipment, the start of an era of recorded rather than live television programmes.](#)

High fidelity, high definition and colour

On the 5th May 1958 experimental 625 line television transmissions began. On the 6th May 1960 [the wedding of Princess Margaret to Antony Armstrong Jones](#) was televised. On the 28th August 1962 stereo radio experimental transmissions began.

UK UHF 625 line television began in 1964 following the allocation of frequencies between 470 and 862 MHz using the PAL 1 standard with a video bandwidth of 5.0 MHz and an audio carrier at 6 MHz supported within an 8 MHz channel. Colour television broadcasts began on BBC2 in 1967. The [Queens Speech was broadcast in colour.](#)

In 1981 [Charles and Diana's wedding](#) was televised. The BBC started work on high definition television with parallel work on NICAM (Near Instantaneous Companded Audio Multiplex) which was adopted by the European Broadcasting Union as a standard for terrestrial TV broadcasting in Europe. The BBC's first full scale HDTV production was in 1989

From there inwards the focus has been on the digital revolution. Digital radio ([DAB](#)) came on air in 1995 and digital television in DVB T 1998. In December 2009 the UK became the first European country to deploy high definition content on digital terrestrial television (branded as Freeview) using the [DVB-T2](#) transmission standard. Magnetic, optical and solid state storage have also developed in parallel with [robust storage compression standards](#). [Digital Radio Mondiale](#) is also being considered for long wave, medium wave and short wave radio.

William and Kate's wedding will be televised in high definition and the Queen's opening speech at the Olympics will probably be recorded and possibly broadcast in [super high definition](#).

Mixed media marriage

However both the wedding and the Olympics will be mixed media events with radio and TV playing a complementary role to web based media including social media platforms. This is evidenced by multiple web sites presently covering the wedding, [www.williamkate.com/](#) and [www.theroyalweddingwilliamkate.com/](#) being two examples. The Queen is of course also on line now at [www.royal.gov.uk/](#) and presumably a royal twitter feed must soon be in prospect.

Political change and progress

Over 90 years the monarchy has therefore had to adapt to successive broadcasting innovations. Each innovation has made the institution and the personalities involved progressively more exposed to public scrutiny.

This has had a number of negative and occasionally tragic consequences but the overall shift apart from being inevitable can be argued as positive.

Irrespective of whether you are a monarchist or arch republican, the monarchy in practice remains at the heart of our present political system which may have its faults but is apparently better than many other alternatives.

Over the past few weeks broadcasting coupled with the internet has demonstrably triggered political change in Tunisia and most recently Egypt. In both cases the presidency and incumbent politicians had become out of touch with popular opinion with a falsely premised belief that they had a right and entitlement to rule.

In the UK it could be argued that the process of public scrutiny via the broadcast media has meant that the monarchy and our related political institutions have needed to adapt to respond to changed expectations – the recent MP expenses scandal being an example of political change. Having a public service broadcaster that is independent of these political institutions is an important part of this process.

It is fashionable to consider that traditional terrestrial broadcasting has a declining relevance in an age where the internet rules. This is at odds with present evidence that suggest that radio and TV has been enfranchised rather than disenfranchised by the internet.

This is at least partly due to technology progress which translates into a viewing and listening and engagement experience which becomes more compellingly immersive and therefore more emotionally influential over time. The integration of images and audio from camera phones is one example of this process at work.

[AJP Taylor](#) cogently argued that advances in broadcasting technology were one of the contributory causes of the Second World War.

Fast forward eighty years and we can see that technology is increasing rather than decreasing radio and TV's ability to shape and influence public opinion and to shape and change political institutions and events.

The UK has been at the forefront of broadcast technology innovation for all of this period. Whether that tradition can be maintained must be open to question. Recent cuts to the BBC World Service, now for the first time smaller than the Voice of America, suggest a lack of political commitment or possibly a recognition that the UK's influence in the world continues to diminish over time.

However it can be broadly asserted that broadcast technology will almost certainly continue to become more rather than less important over time both for the monarchy, the British political system and as the prism through which the rest of the world perceive us. Radio and TV will become more rather than less powerful over time.

This would suggest that ensuring broadcasting remains independent of political, corporate or individual interest remains fundamental to a well ordered society. This would seem at odds with present political intent.

As part of a UK based Wireless Heritage initiative in association with the Pye Telecom Historic Collection we would very much like to produce a collection of articles based on personal reminiscences of radio system design and implementation.

If you have a story to tell or would like to join the Wireless Heritage Special Interest Group - then please contact

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