

1974 to 1994 - *Radio gets personal*

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AGENDA

Radio

Television

Military Communications

Satellite Navigation

Radiopaging

The Mobile phone

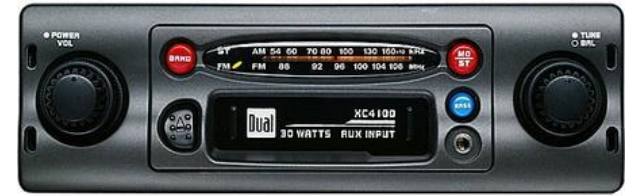


Domestic Radio

- The rise of FM



- 1973: Legal commercial broadcasting began in UK
- 1976: 20 independent local radio stations
- 1978: new international frequency plan for AM bands
- 1978: BBC re-organises its AM frequencies
- 1983: FM band extended to include 97.7 to 108 MHz
- 1983: regional programmes on Radio 4 FM ended
- 1987: FM band further extended down to 87.6 MHz
- 1992: Classic FM and Virgin Radio started
- 1990s: Simultaneous AM/FM transmissions cease and FM becomes dominant for UK radio listeners



The Car Radio

FM was initially transmitted using horizontal polarisation – not ideal for vertical car aerials

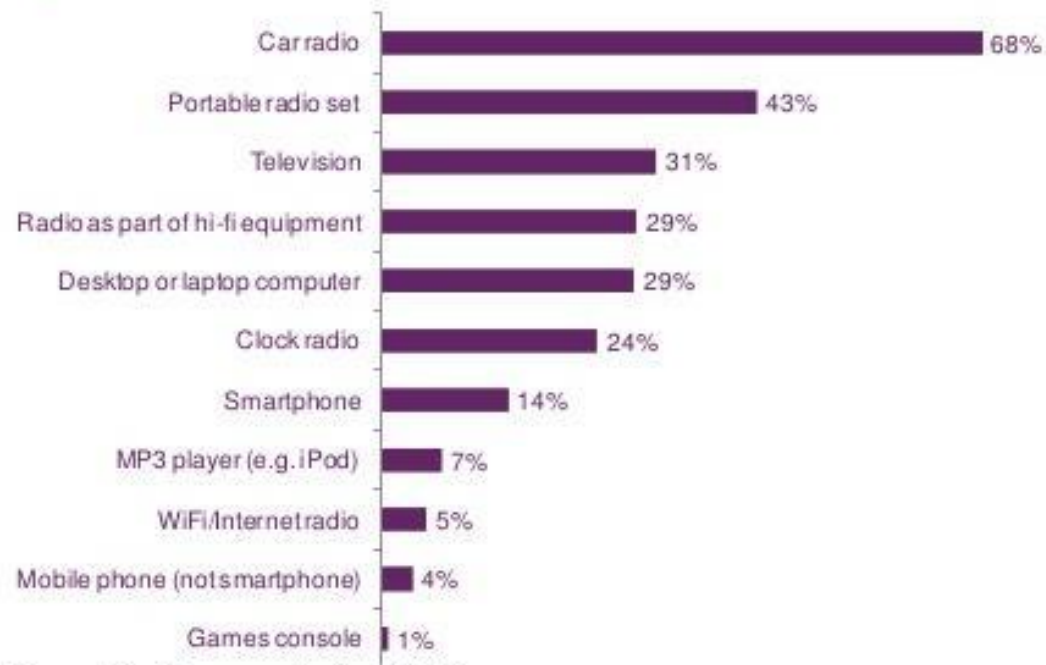
- 1980s: BBC converted its FM transmitters to mixed polarisation
- 1980s: FM became standard on portable radios but optional on car radios
- 1990s: FM becomes standard on car radios

The car radio remains the dominant device for listening to radio. Ofcom CMR 2013



The Car Radio

Figure 3.11 Devices used to listen to radio



Source: YouGov research, May 2013⁶¹

Base: All adults aged 16+ who regularly listen to radio (n = 866)

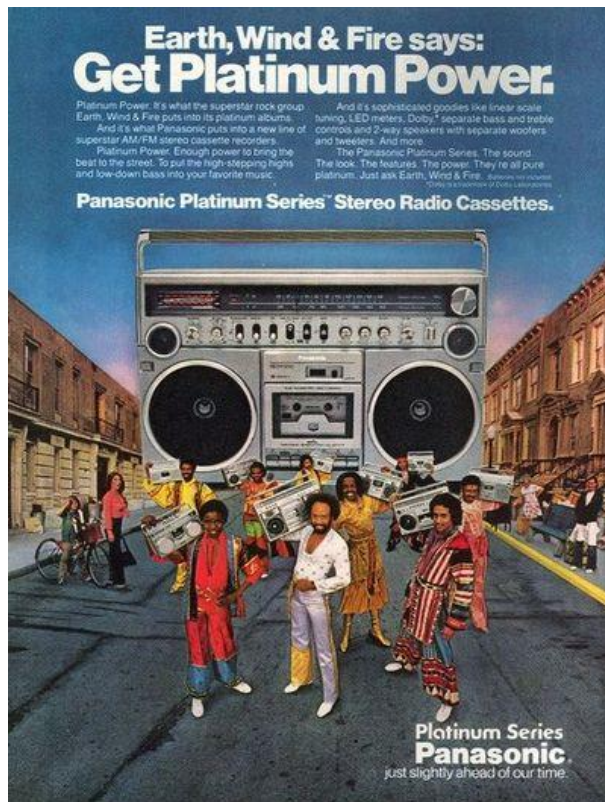
Q15. Which of the following devices do you currently listen to the radio on? Please choose all that apply.

Improving the listener experience

- 1980s: Growth in FM brings more stereo transmissions
- 1974: European Broadcasting Union –
 - system for automatic radio tuning on FM
- 1984: First specification for the Radio Data System (RDS)
- 1987: BBC trials RDS
- 1988 : BBC launches RDS on FM



Personal radios



Citizens Band Radio

- 1973: Illegal use using equipment imported from the USA (27MHz)
- 1978: EMI Film “Convoy” popularises CB
- 1981: CB Legalised in the UK (2nd November).

Imported USA CB equipment was made illegal. People had to buy a £15 licence from the Post Office.

UK system was also on 27MHz band but at a slightly different frequency range than used in the USA.

8th December 2006 – Ofcom made CB licence free

CB RADIO AT RUMBELOW'S!

Citizen Band radio is here. So the Rumbelows offer you the chance to create your own 'radio station' with a whole range of competitively-priced, top quality equipment. So tune in to a sophisticated 40 channel rig at Rumbelows and go on the air with the full backing of the unique Bond, which includes:

- 30-DAY EXCHANGE OR MONEY-BACK
- FREE SERVICE FOR A YEAR
- ACCESS AND BARCLAYCARD WELCOME

WIDE CHOICE OF CREDIT TERMS AVAILABLE

Amstrad CB901. 4 watt output. Tone, squelch, volume and RF gain controls. Automatic channel 9 switching. **£89.99**

Binatone Speedway. Continuous variable squelch (cuts out interference). Control for quiet standby operation. Extension speaker socket. RF output power meter. **£69.99**

SWR METER AND WIDE CHOICE OF AERIALS AVAILABLE

RUMBELOW'S

We save you money and serve you right.

Television



- 1979: Experimental Nicam 1 transmission of Elton John concert from Moscow's Rossyia Hall 28th May)
- 1985: 405 Line TV transmissions cease
- 1988: Launch of Astra 1A Satellite
- 1989: Astra1A starts broadcasting (5th February) - Sky
- 1990: BSB Launches its 5 channel service
- 1990: Sky Movies is encrypted as a subscription service
- 1991: BBC TV officially launches its Nicam service on terrestrial TV (31st August)

Military Communications

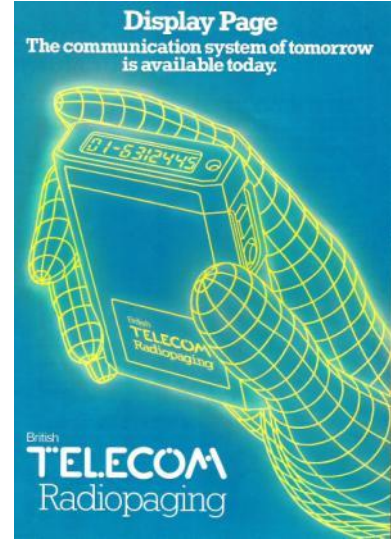
- 1965: General Staff Requirement
- Racal, Mullard and Plessey develop the Clansman system
- Replaced Larkspur
- Became the standard for British Forces from 1976 (until 2008)
- Offered Single Side Band and NarrowBand Frequency Modulation, HF, UHF and VHF
- Clansman family comprised 9 units: 3 for vehicles, 6 for foot soldiers



Satellite Navigation

- 1970s: LORAN
- 1978: First experimental Block 1 GPS satellite
- 1983: Shooting down of Korean Airline (Flight 007) prompts President Reagan to offer GPS for civilian use
- 1985: 10 more Block 1 satellites in orbit
- 1989: First of the GPS Block 2 satellites launched
- 1990-91: Gulf War – first conflict to use GPS
- 1994: 24th GPS Block 2 satellite operational

(105 to 170MHz and 450 to 470 MHz)



Radiopaging

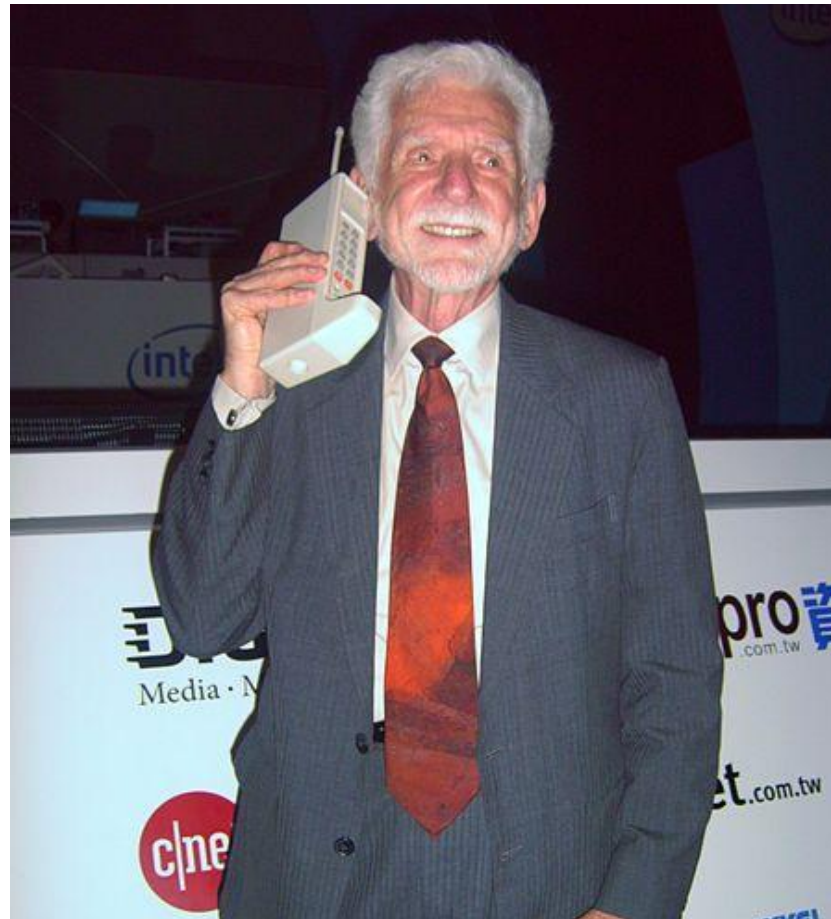
- 1975: Post Office Code Standardisation Advisory Group (POCSAG) developed Paging Code from earlier work by Philips.
- 1977: January – GPO extends its Radiopaging service to London (800 square miles centred on Farringdon)
- 1977: July – 3,000 customers using the service
- 1981: Nationwide coverage achieved.
- 1990s: Decline in usage begins with emergence of mobiles

Operators: BTCellnet Paging / Mercury Paging Ltd /
Vodafone Paging / HutchisonPaging

Foundations of Mobile

- 1947: D H Ring, Bell Labs, “Mobile Telephony – Wide Area Coverage”
- BUT it was the car radio telephone service that evolved.
- UK: the GPO introduced a 50 channel system using Stornophone equipment which was enhanced further in 1983 with automated connections. The Public Radio Telephone System Four (PRT4) was the final iteration.
- Radio ‘zone’ concept first trialled in 1969 using payphones on the Metroliner train service between New York and Washington.
- 3rd April 1973 – Motorola develop the world’s first handheld ‘cell’ phone.

Foundations of Mobile



The Mobile Network

- FCC approval was slow.
- In 1975 Bell Systems were permitted to begin a trial
- In 1977 the FCC approved AT&T to offer a service in Chicago.
- Trials also conducted in Stockholm in 1977 (NMT) and Japan in 1975 (NTT).
- Nordic Mobile Telephone System (NMT450) began operating in Denmark, Sweden, Finland and Norway in 1981.
- 12th October 1983, first USA commercial cellular service opened in Chicago using the Advanced Mobile Phone service (AMPS).

UK ETACS Networks

- 1982: UK Government announces two licences
- One to BT – creates BT Cellnet; one open to competition
- Second licence awarded to Vodafone
- Development of AMPS – Total Access Communication System (TACS).
- 890-905MHz and 935-950MHz. Giving 600 x 25kHz analogue channels
- Later extended to 872-905MHz and 917-950MHz to give 1320 x 25kHz analogue channels. (ETACS)

UK Launch



?
What mobile phone
did he use
?



vodafone

1st January 1985



7th January 1985

First Generation Handsets



Nokia Mobira Talkman



Motorola 8500X



Nokia Mobira Cityman

1320

Iconic Designs . . .



Motorola MicroTAC
(1989)



Nokia 101
(1992)



Motorola StarTAC
(1996)

Telepoint

- 28th July 1988 Lord Young announces plans to issue 4 licences for Telepoint services.
- 864.1 to 868.1MHz, mean output power of 10mW, giving an operating range of typically 150m.
- Phonepoint (BT) became the world's first Telepoint service when it was launched in August 1989.
- Zonephone and Callpoint launched in 1989.
- 21st May 1992, Rabbit (Hutchison) launched using CT2 standard.
- Closed on 31st December 1993.



Seeking a European standard

- 1986 - 100,000 mobile phone subscribers within the UK
- 1987 – 200,000
- 1995 – 7% of the UK population

BUT everything stopped at the English Channel and costs of ownership remained high.

7th September 1987 – EU Memorandum of Understanding on the implementation of a Pan-European 900 MHz Digital Cellular Mobile Telecommunications Service by 1991.

Chris Gent, Vodafone, “*The most important document in the history of the mobile phone.*”

Analogue becomes Digital

- Finnish Prime Minister Harri Holkeri inaugurates the world's first GSM network – the Radiolinja network in Finland - on 1st July 1991.
- The story of GSM and its onward evolution is covered by the next presentation.

Thank you

