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Compression, convergence and conviviality

the contribution of new technologies to developments in radio from the 1980s

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expandedversion of presentation prepared for ICOHTEC 2017 http://www.icohtec.org/annual-meeting-2016.html

Old paradigm

- Broadcasting
- Limited bandwidth
- Listener response:
  - Letters
  - Phone-ins
- Other media
  - Print (*Radio Times, Listener* …)

New paradigm

- Narrowcasting
- Flexible bandwidth
- Listener response:
  - Letters
  - Phone-ins
  - Email / texting
  - Social media (facebook, twitter, chat)
- Other media
  - Print (*BBC Magazines* …)
  - Websites
  - Images
  - Videos

Discussion points

- Convergence of audio and video (including telephony)
- Role of standards
- Compression technologies
- Military & civil technologies
- Social aspects
  - Communication between audience, content developers and broadcasters
  - Conviviality

Standards

- MPEG suite
  - Moving picture experts group, established in 1988
  - Digital TV
  - mp3: MPEG-1/2 audio layer III
  - Digital analogue broadcasting
  - Now integral part of smart phones
- Advanced Audio Coding (AAC)
  - Default for *YouTube*, *iPhone*, etc
  - DAB+ (not forward compatible with MPEG DAB)
- Military / civil links

Military / civil links

- Coding
  - Development of CDMA
  - Uses pseudo-random codes instead of time- or frequency multiplexing
  - Military: security
  - Civil: noise resilience and bandwidth efficiency
- Hardware advances
- 3G: wireless telephony, Internet access, video calls and mobile TV technologies ; IUT specificationj IMT-2000
- 4G: originally envisioned by *DARPA*; standardised 2008
  - Uses OFDMA rather than CDMA
  - IP-based

Compression

format	*sampling frequency*	*quantization / bit rate*	*file size*
WAV	192 kHz	24 bits	329 MB
	96 kHz	24 bits	164 MB
	88.2 kHz	24 bits	151 MB
	48 kHz	24 bits	82.4 MB
	44.1 kHz	24 bits	75.7 MB
	44.1 kHz	16 bits	50.4 MB
MP3	44.1 kHz	320 kbps	11.4 MB
	44.1 kHz	256 kbps	9.15 MB
	44.1 kHz	192 kbps	6.86 MB
	44.1 kHz	128 kbps	4.57 MB
	44.1 kHz	92 kbps	3.43 MB

How is it done?

- Human hearing characteristics
- Frequency compression
- Temporal compression
- Enormous file size reductions

Compression

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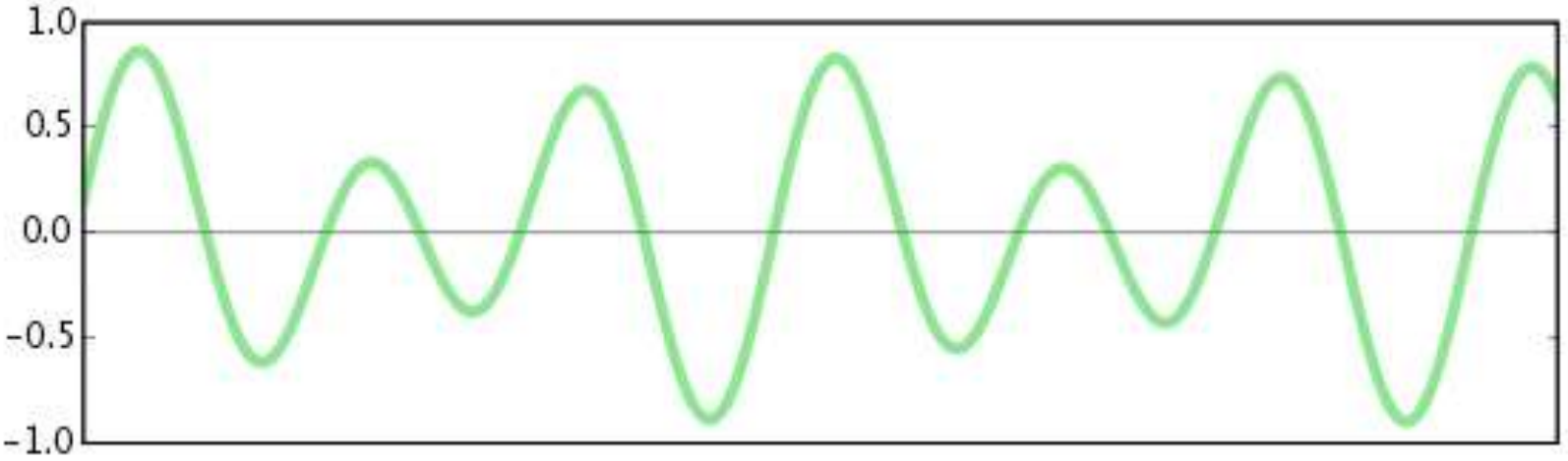
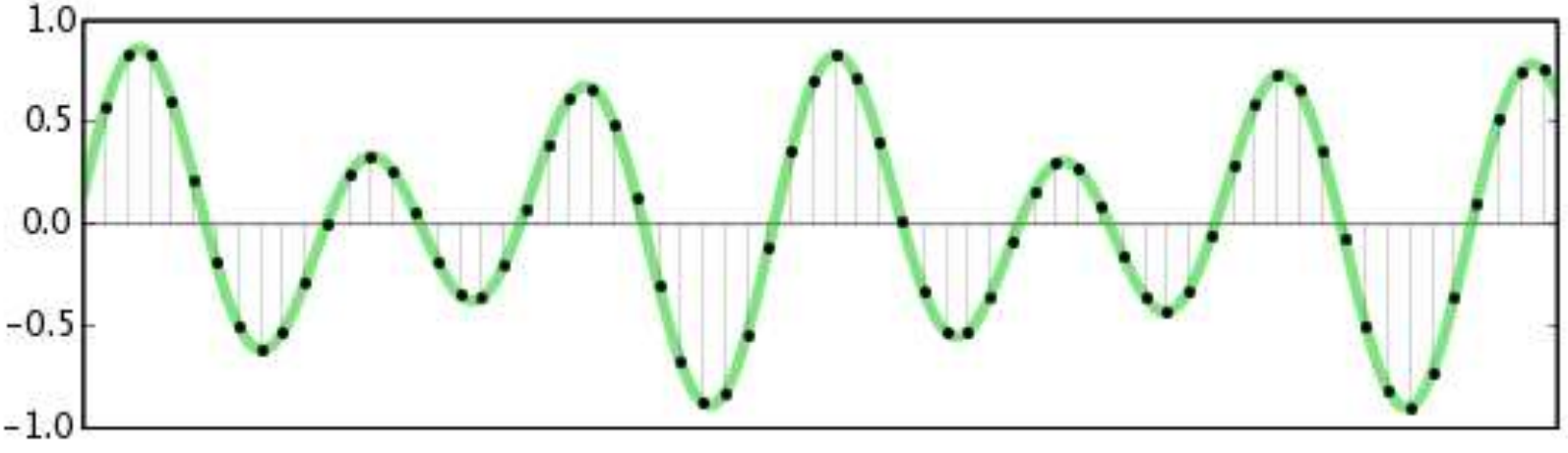
Digitisation

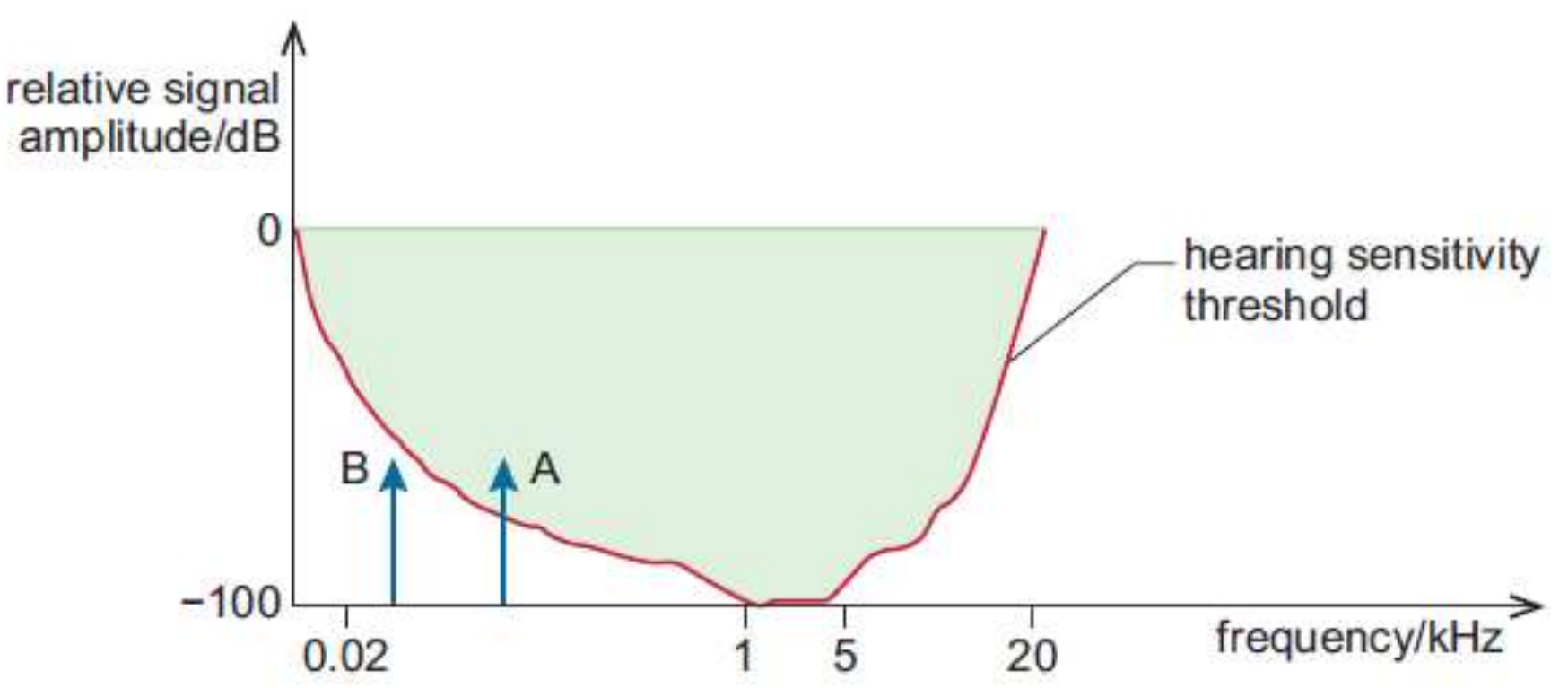
analogue – transmit a continuous replica of original



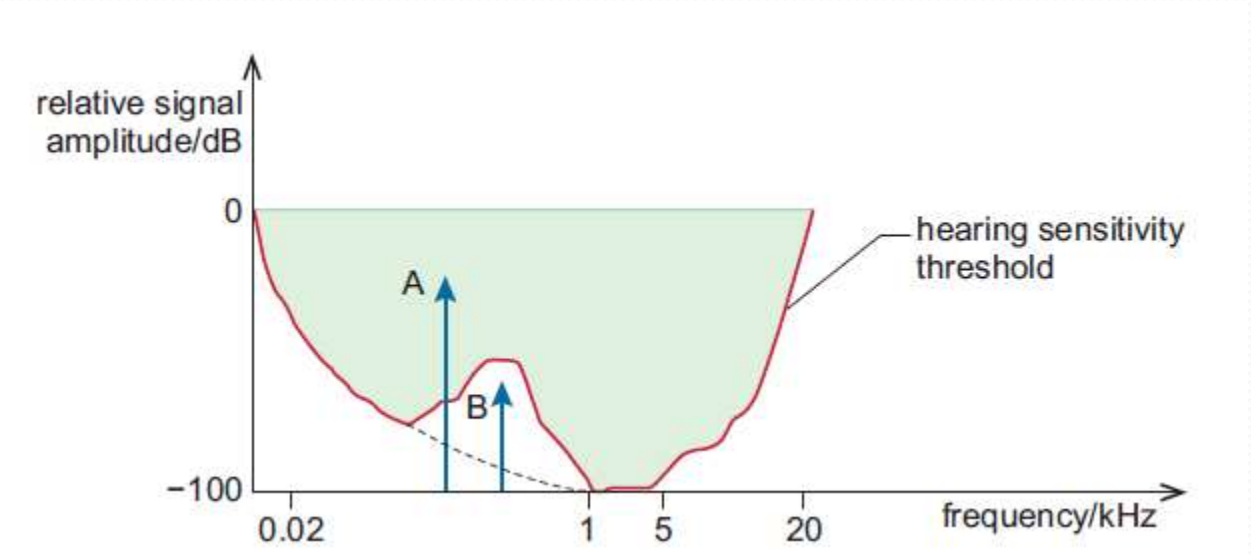
digital – transmit a series of numbers (sampling rate depends on frequencies)



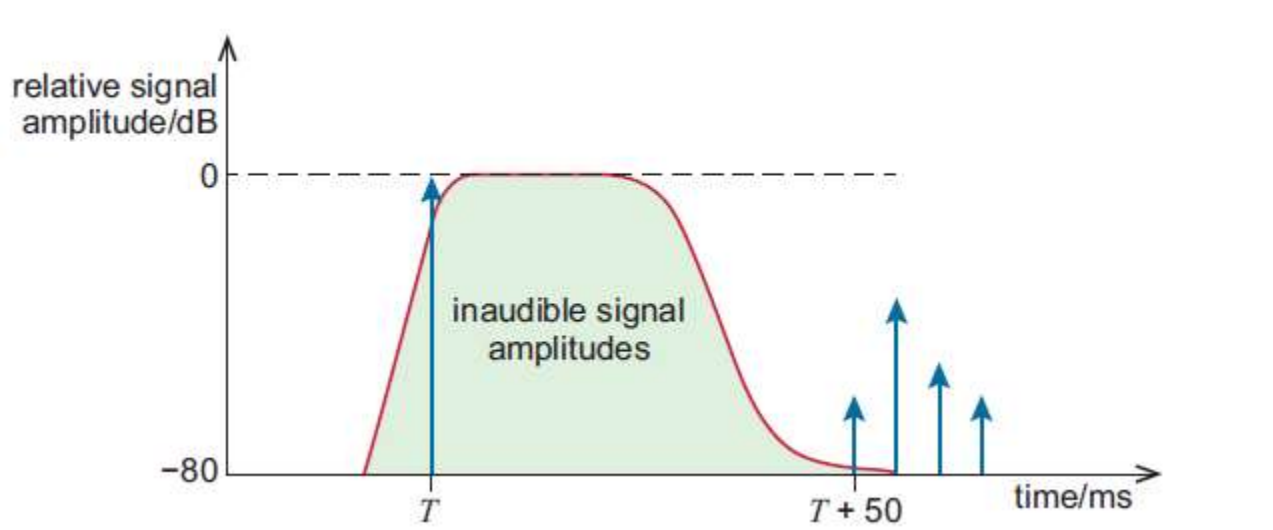
Hearing threshold



Frequency masking



Temporal masking



Mp3: a cultural artifact?

- technological artifacts 'embody specific forms of power and authority' (Winner, 1986)
- mp3 an attempt to solve the problem of exchangeable formats across segments of the media industry
- may require particular social and cultural systems of both intellectual property and listening
- 'works for' and is 'worked on' by a host of people, ideologies, technologies and other social and material (Sterne, 2002)
- ownership – like digital images – rather than simply consuming!

Convergence

- In place of the old system is a new one, which has been called "convergence culture."
- Encompassing the hybridization of technologies and the collaboration of corporations on one hand, convergence also highlights the penetration of the audience itself into the spheres of production, promotion, and distribution.
- Many academics, commentators, and fans themselves see convergence culture as an ultimate victory …
- But is it just free labour?

Conviviality and on/off-line (examples from BBC, but common to many broadcasters)

- Podcasts
- Videos
- Streaming and downloads
- Message boards
- Twitter
- Facebook

Some reasons

- Commonality of technologies
  - Web
  - MPEG / mp3 / DAB
  - MPEG video / DTV
- User knowledge
- Transferable user skills

Available now & Coming soon

Podcasts

The Archers

Contemporary drama in a rural setting

BBC RADIO 4

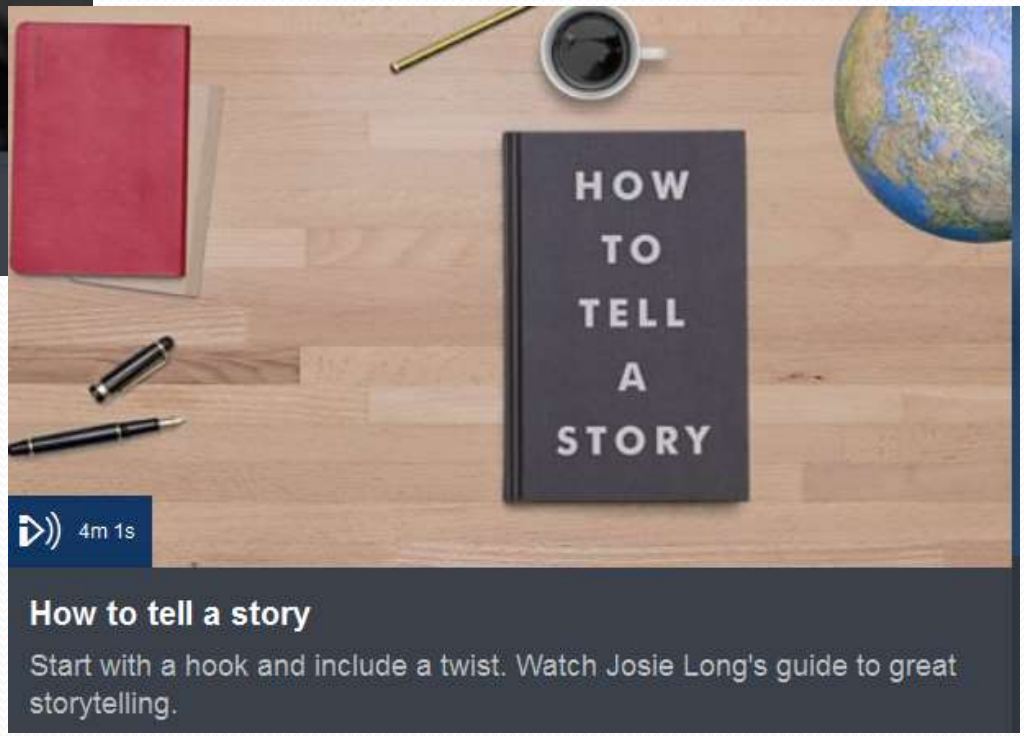
The Archers Omnibus

The week's events in Ambridge

BBC RADIO 4

Video

1h
Roald Dahl: Going Solo


HOW
TO
TELL
A
STORY
4m 1s
How to tell a story
Start with a hook and include a twist. Watch Josie Long's guide to great storytelling.

On air 14:00 - 16:30

Afternoon on 3

2015 Verbier and Lucerne Festival Highlights

Highlights

BBC Proms 2016: Cello

See the cello in a new light as Sol Gabetta performs Elgar's Cello Concerto.

+ Add

Composer of the Week: Mozart

Donald Macleod explores Mozart's childhood, spent as much away from Salzburg as at home.

+ Add

Halevy's La Juive

Roberto Alagna stars in the critically acclaimed production from Bavarian State Opera.

+ Add

Message boards

Discussion	Replies	Started by	Latest reply
Points of View Message Boards ... Hello everyone, my name's Simon, and I'm the Series Producer of ...	972	*Simon Miller ...*	**4 Weeks Ago**
Alternative message boards Prior to the closure of the Points of View message boards, some ...	3	*Simon Miller ...*	**4 Weeks Ago**
What's the music please? Trying to identify music from a programme?Post your query here ...	3330	Peta	**4 Weeks Ago**
Background music in BBC TV ... Hi all,this is a new thread for your comments on music used in ...	3241	Peter	**4 Weeks Ago**

BBC

TWEETS	FOLLOWING	FOLLOWERS	LIKES	LISTS
4,670	91	552K	3,598	24

BBC
@BBC

Our mission is to enrich your life and to inform, educate and entertain you, wherever you are.

TV. Radio. Online
bbc.co.uk
Joined January 2009

936 Photos and videos

Tweets | Tweets & replies | Media

BBC Retweeted

BBC Archive @BBCArchive · 2h

#OTD 2013: On her 16th birthday, Malala Yousafzai addressed the UN, campaigning for free education for every child

"One child, one teacher, one book and one pen can change the world"

BBC Facebook

Conclusion

- Audio compression based on psychoacoustic models has led to enormous file compression
- Storage requirements and transmission rates improved
- Time is shifted (catch-up audio and video)
- Social change
  - Social media
  - Citizen journalism / AV production
  - Conviviality and convergence