> DISTRIBUTION PLATFORM COST-BENEFIT ANALYSIS FOR RADIO BROADCASTERS AND LISTENERS

> LOW-COST DAB+ BROADCASTING TOOLS

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28 MAY 2018

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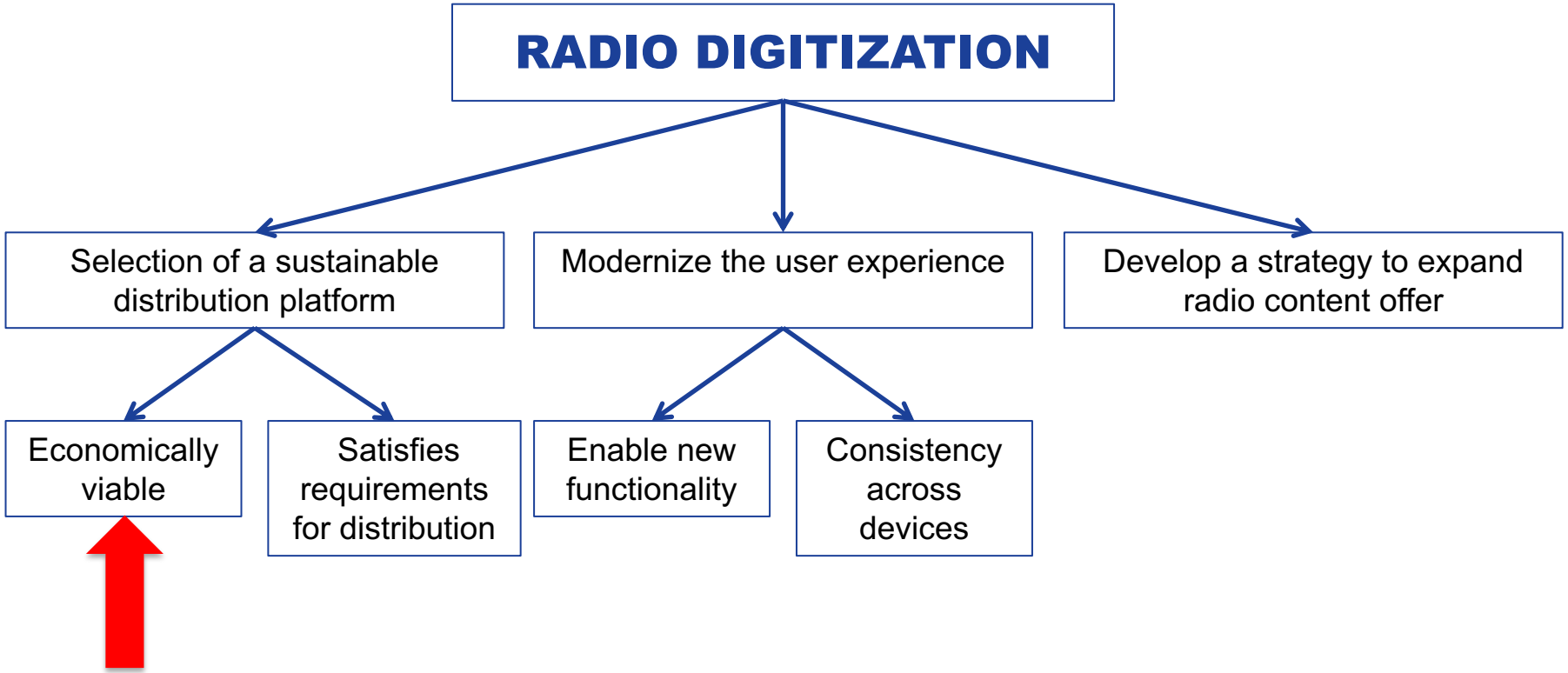
WHAT ARE WE TALKING ABOUT?

A PROCESS TO MAKE RADIO
“FIT FOR THE FUTURE”



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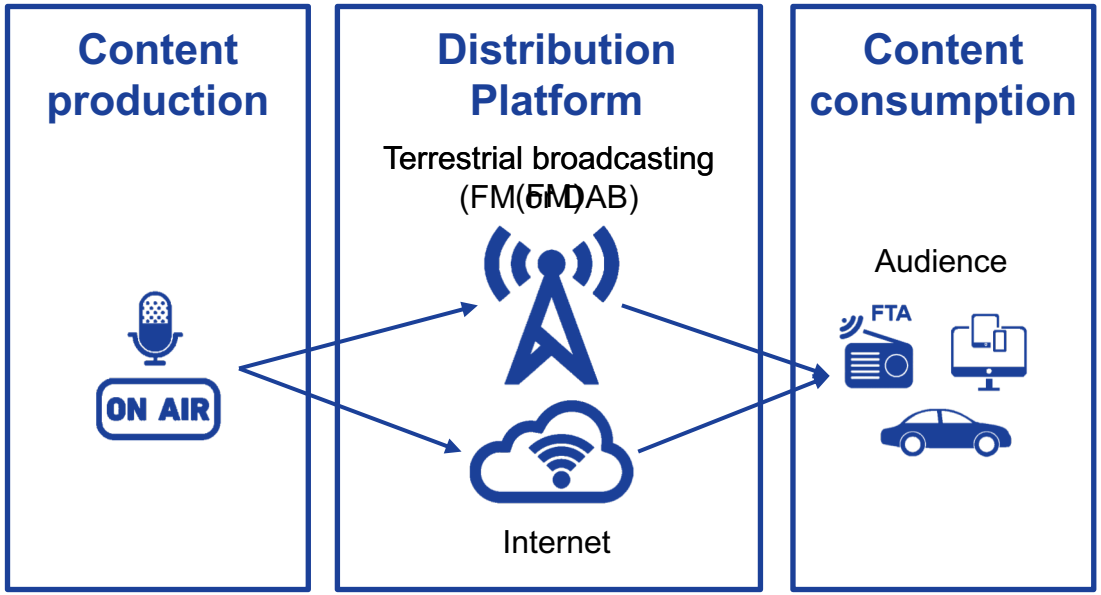
TECHNICAL REVIEW AVAILABLE ON TECH.EBU.CH

This presentation shows the outcome of the technical review.

Further explanations on methodology, assumptions and input figures can be found in the review document.

https://tech.ebu.ch/publications/tr_2017_radio

WHAT IS THE MOST COST-EFFECTIVE DISTRIBUTION PLATFORM?

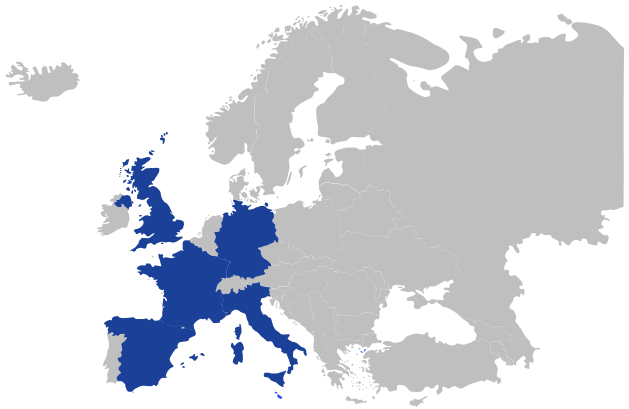


The economic sustainability is a
key argument

SCOPE

To provide an indication of the costs to transmit and to listen to radio

(Not all possible variables like universality, reach, ease of use, … are considered)



The big five European markets as baseline

- Population: 321 M (63% of the union)
- Area: 2 Mkm2 (46% of the union)
- GDP: 13212 Billion$ (71% of the union)

Normalised country (scalable model)

- Population: 72 M
- Area: 390k km2

Distribution:
National broadcaster costs for FM, DAB and internet.

Reception:
Listeners costs to listen <u>on the move</u>.

RADIO DISTRIBUTION COST

RADIO DISTRIBUTION COST DEFINITION

OPEX

- Energy consumption
- Heat dissipation
- Site maintenance cost
- Site rental cost
- …

DATA REQUIRED

- Number of transmitters
- Transmitter power
- Site categorization and associated costs

FM

- Networks analysis
- Members data
- Categorization techniques based on transmitter power

DAB/DAB+

- Reverse engineering
- Members data

OPEX

- GB of data distributed via CDN

DATA REQUIRED

- Price per GB
- Listening time
- Bitrate
- Population

- CDN pricing
- EBU statistics

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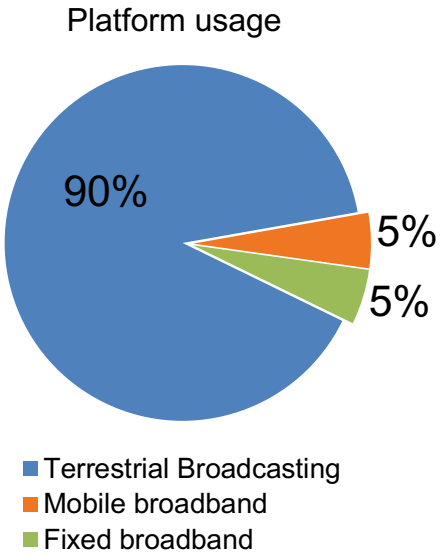
Full methodology explained at: https://tech.ebu.ch/publications/tr_2017_radio

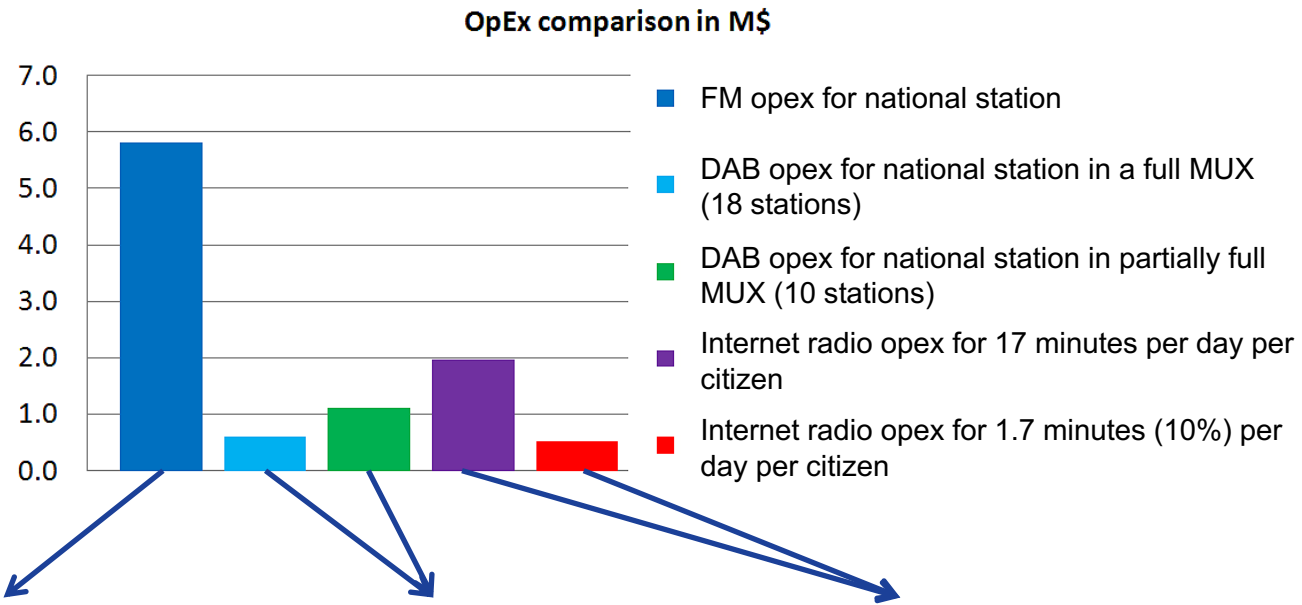
KEY STATISTICS FOR RADIO DISTRIBUTION



According to EBU statistics:
National radio daily listening time per citizen: ~17 minutes

All listening time through the internet: 17 minutes
Realistic listening time through the internet: 1.7 minutes

RADIO DISTRIBUTION COST ANALYSIS



FM is by far the most expensive distribution technology

Due to multiplex technology, DAB is inexpensive. In the best case it could be 10 times cheaper than FM

The expense for internet distribution is highly variable and can easily grow larger than DAB and similar to FM

RADIO RECEPTION COST

RECEPTION USE CASE

Reception Use Case	FM	DAB	Wi-Fi	MBB
Indoors (at home, in the office,…)	Available	Available	Available	Available
In car (via traditional radio, smartphone…)	Available	Available	Not Available	Available
On the move (portable radio, smartphone, …)	Partially Available	Partially Available	Not Available	Available

In this case Terrestrial Broadcasting might not be sufficient.
Mobile broadband ensures full availability of radio in this scenario

RADIO LISTENING COST DEFINITION

	FM	DAB	Wi-Fi	MBB
Public broadcaster licence fee	**FTA, no additional expense**	**FTA, no additional expense**	**Fixed broadband subscription**	**Mobile broadband subscription**

Cost to access radio	
Broadcasters licence fee	LTE subscription with sufficient data allowance
EBU Members data	• MBB subscriptions analysis • Listening time • MBB radio share • Bitrate

Actual expense	
Broadcaster licence fee allocated to radio	LTE traffic allocated to radio
EBU Members data	• MBB subscriptions analysis • Listening time • MBB radio share • Bitrate

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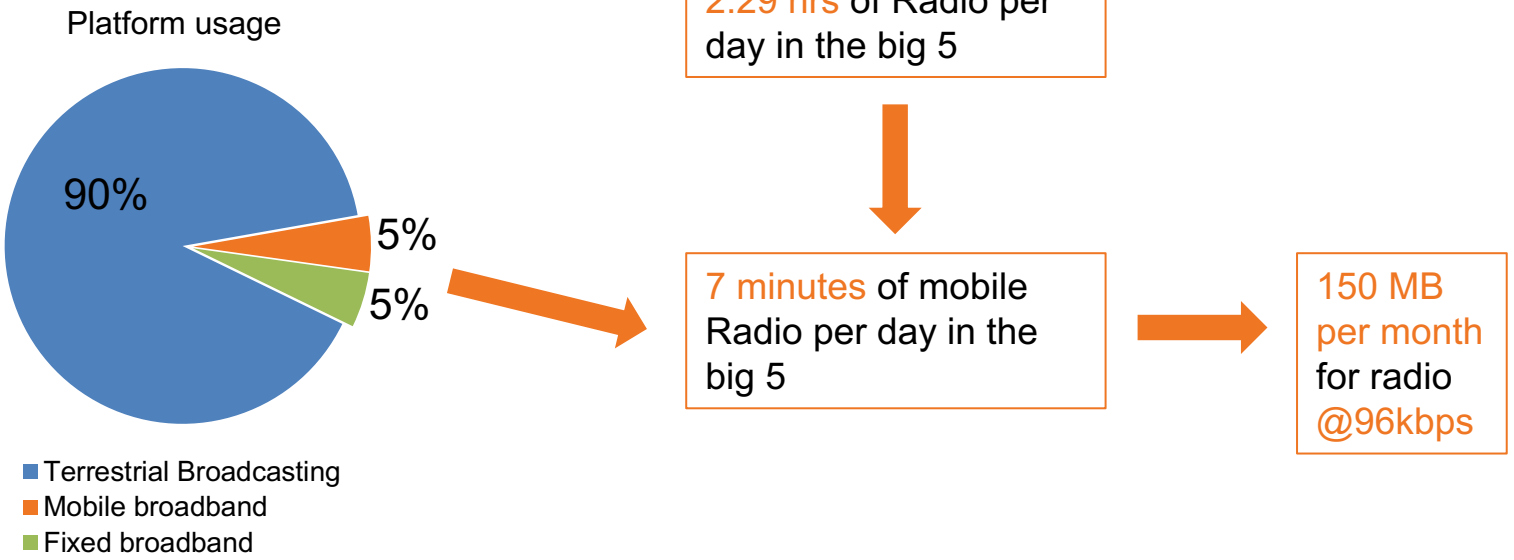
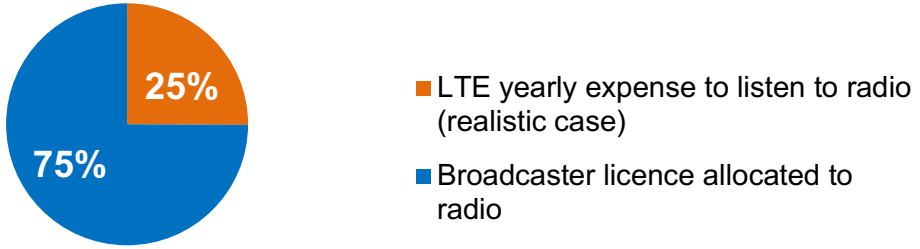
KEY STATISTICS FOR RADIO CONSUMPTION



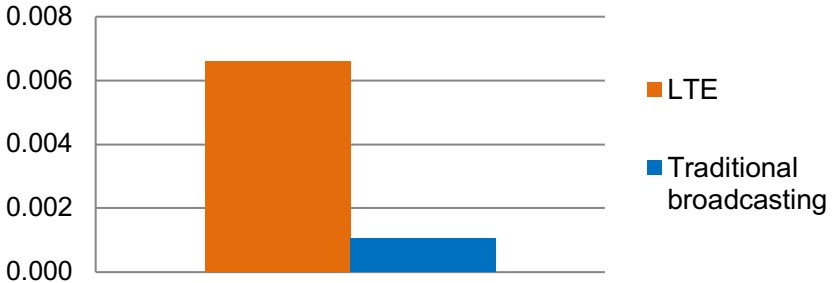
RADIO LISTENING COST ANALYSIS

At first glance 25% is not high but… Realistic LTE radio listening is about 5% of the total listening time and it accounts for the 25% of the real expense.

Yearly expense on radio (71 euro), realistic LTE radio listening



Listening cost per minute in euro



For listeners 1 minute of radio over LTE networks costs **seven** times more than listening on terrestrial broadcasting networks.

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Full methodology explained at: https://tech.ebu.ch/publications/tr_2017_radio

CONCLUSIONS

Radio transmission

1) DAB is a much cheaper option than FM, it allows cost sharing due to the MUX architecture.
2) DAB cost saving is significant and it would allow the creation of new content and employment
3) Internet delivery only is not competitive with the current pricing level
4) Internet delivery expense is much higher than its current percentage market share

Radio listening

1) Internet is now part of everybody's life but mobile broadband is too expensive for media consumption
2) Internet-only delivery would prevent many families from accessing information and entertainment due to a prohibitive access cost
3) The current expense for internet radio listening is much higher than its current percentage market share.

A DAB+ backbone with additional hybrid services is the way forward.

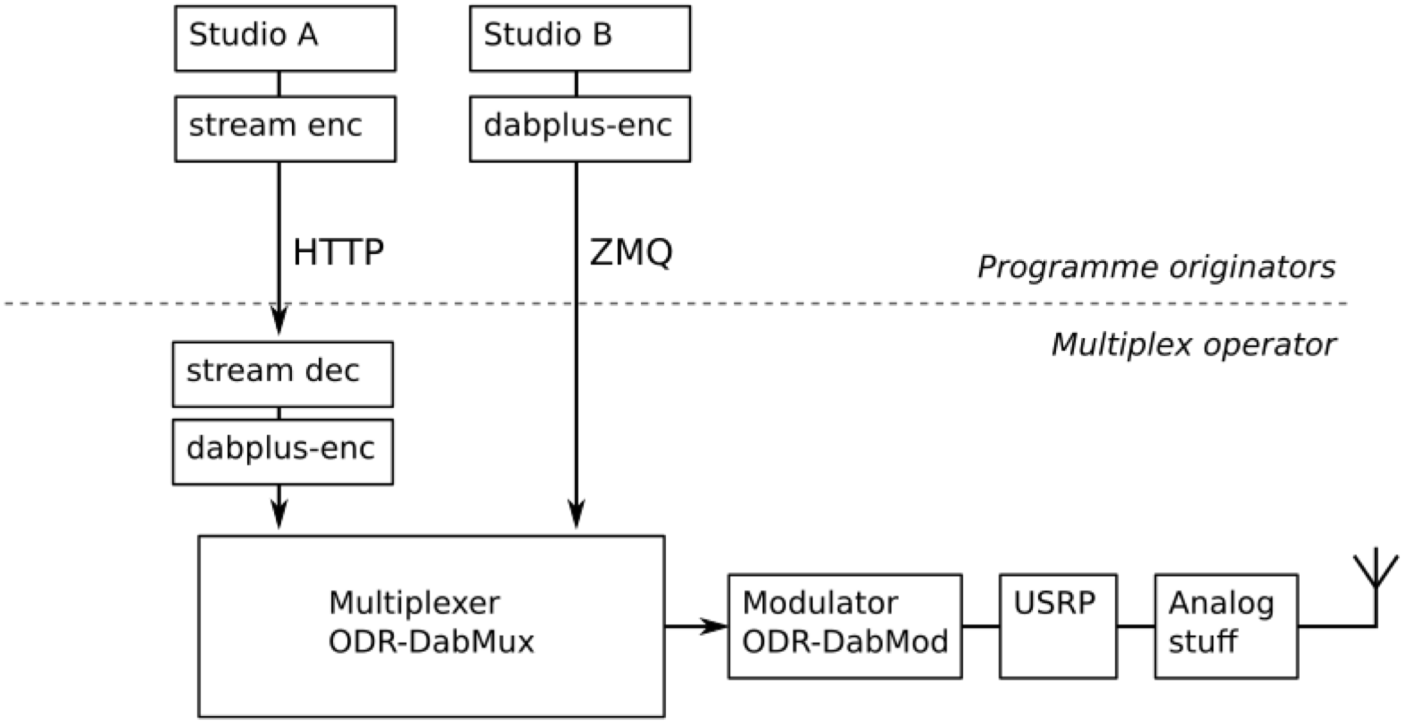
LOW-COST DAB+ BROADCASTING

HISTORY OF LOW COST DAB

2006-2008: Development of the original tools by the Canadian Communications Research Centre (CRC)
2009: CRC opens up the source code of the multiplexer to freely use
2010: CRC opens up the source code of the modulator. DAB+ multiplexing added. Trial broadcasts in Ireland and Switzerland.
2011: Long-term tests started in Denmark.
2012: High-power DAB+ test across Geneva, during EBU Radio Week
2013: Pilot commercial services started in Switzerland, using low-cost DAB+. UK Report on using low-cost DAB+ for small-scale services.
2014: Regular DAB+ transmission in Geneva. Services in Marseille, France. Regular transmissions in Zurich.
2015: UK Small Scale trials commenced. Additional sites added in Switzerland

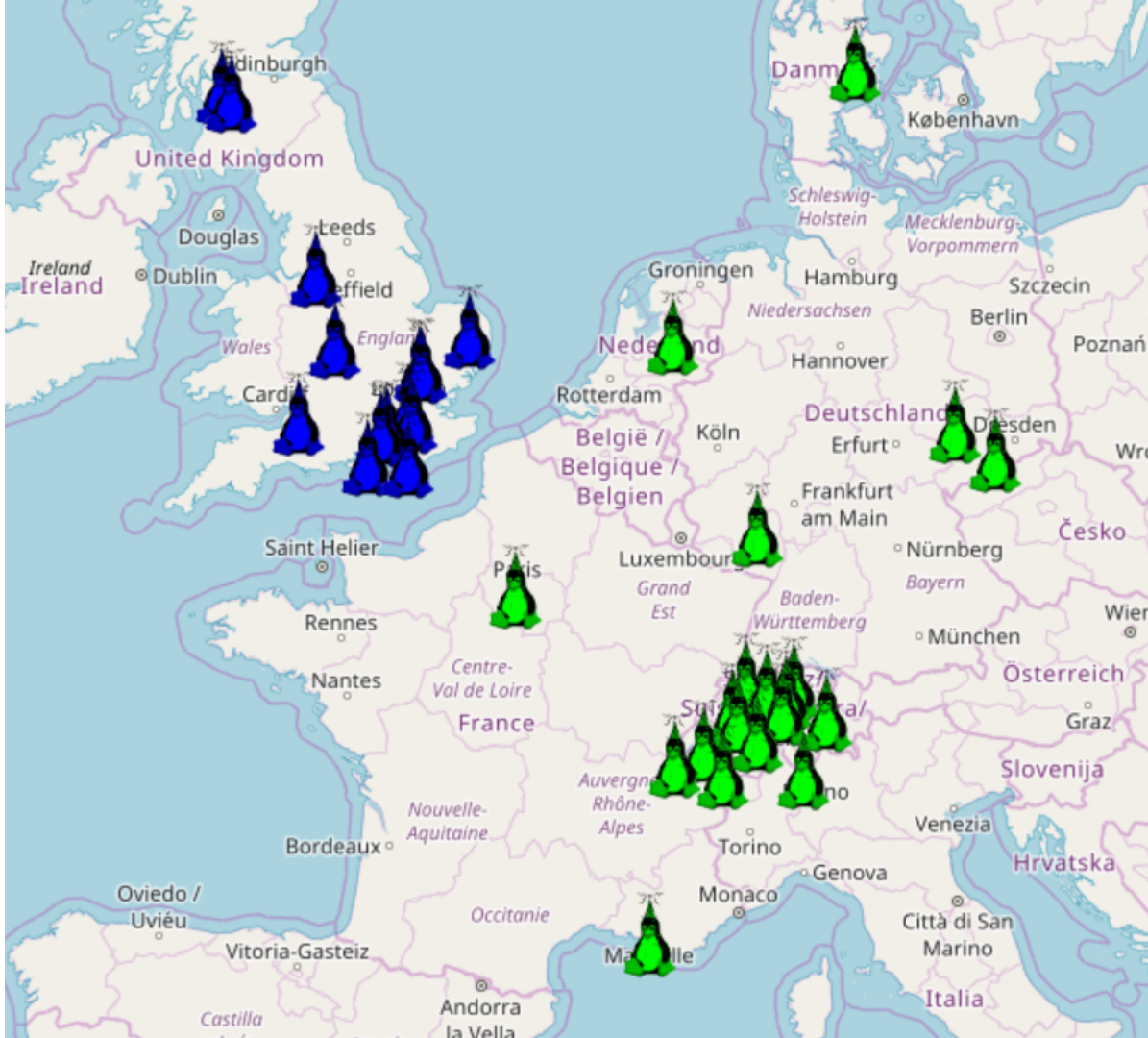
WWW.OPENDIGITALRADIO.ORG

LOW-COST BROADCAST CHAIN



CURRENT PROGRESS*

- UK Minimux Trials (10)
- Germany (3)
- Netherlands (1)
- France (2)
- Denmark (1)
- Switzerland (13)



* Taken from opendigitalradio.org

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UK MINIMUX TRIALS

TRIAL SETUP

- Off-the-shelf computer
- UPS, Network Switch
- Power Amplifier
- Mask filter
- SDR Peripheral
- Small encoding boxes at each radio station (for contribution)
- Served over consumer broadband
- Some run as managed services
- Some integrated with existing contribution (e.g. AES67)

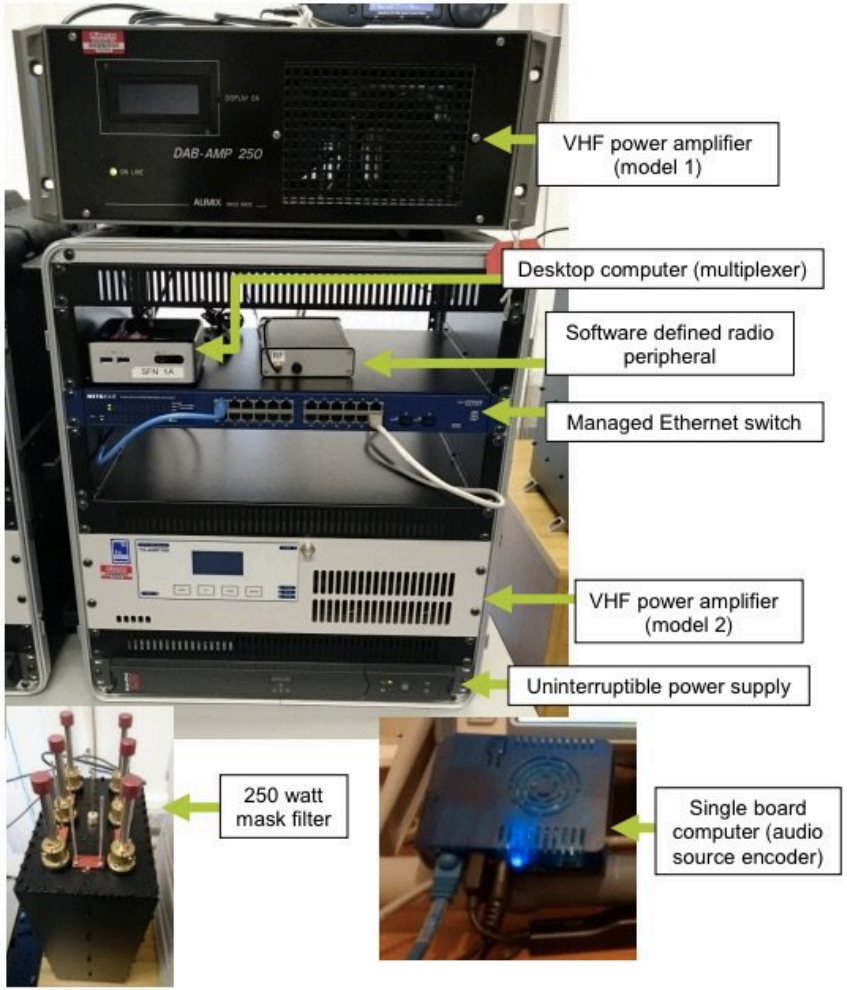
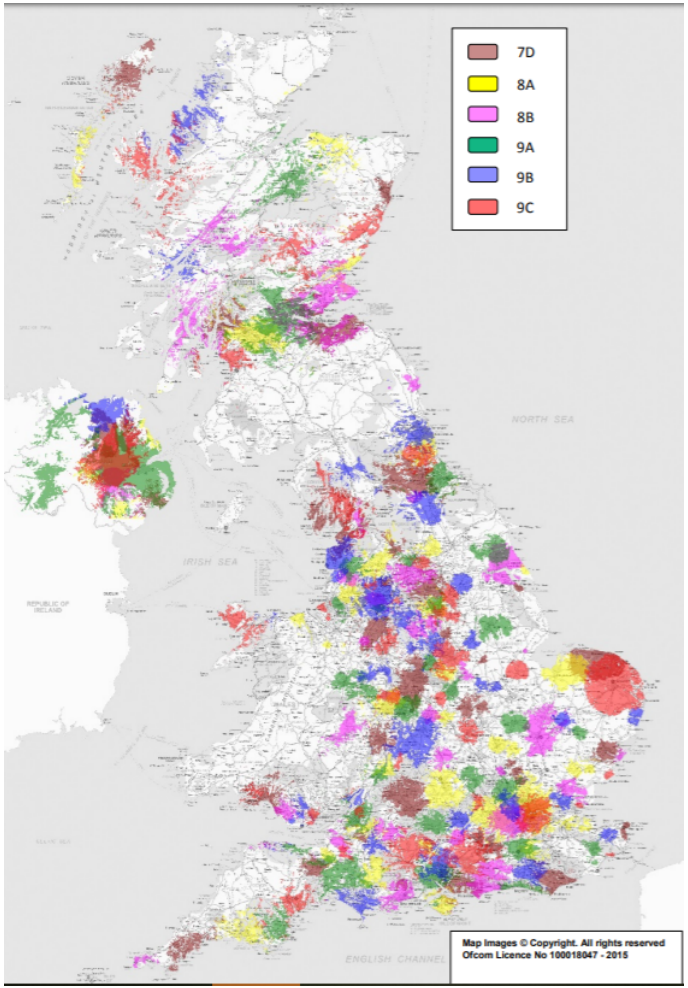


Figure 1: Trial transmitter equipment – main components

MINIMUX TRIAL CONCLUSION AND FUTURE EXPANSION

- Trials considered a success: > 150 additional services now on air from 10 multiplexes
- Great interest from community station
- Potential for great coverage, additional services
- Feasibility study concluded for **192** ‘small scale’ multiplexes
- Expanded use of Band III spectrum
- Proposed transmission sites modest: 100W ERP



THANK YOU!

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