



Local DAB+ broadcasting

WorldDMB GA

Amsterdam

6th November 2013

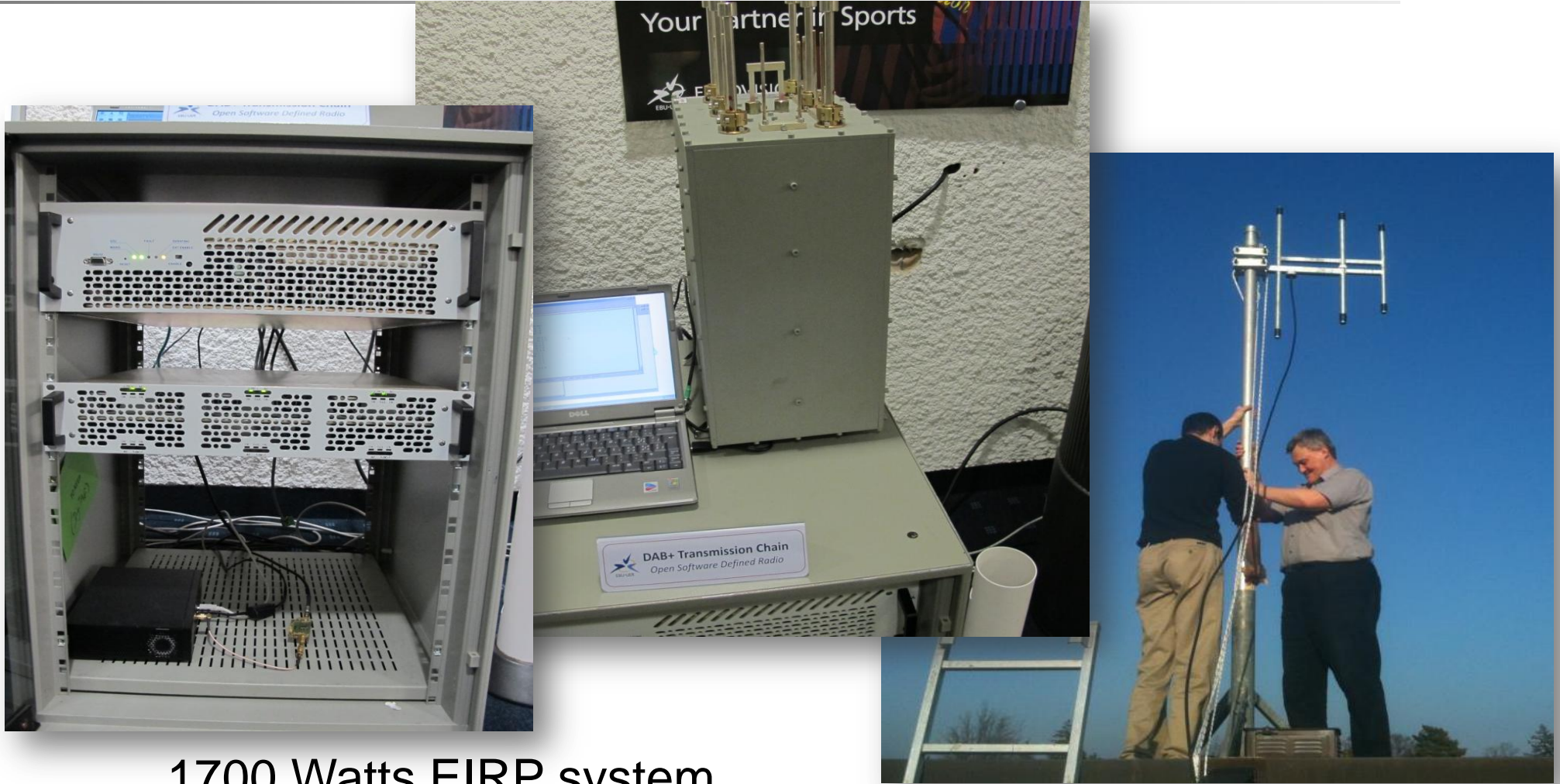
Mathias Coinchon

Conclusion from 2010 GA local DAB+ presentation

- Digital radio transmission gets democratised
- This solution is **EXPERIMENTAL**
 - And we are not selling a solution nor providing any service
- Good for experimentation, local broadcasting, etc
- Not a threat for DAB industry but an opportunity
 - Open/democratised tools enable innovation (Internet example)
- All this is possible thanks to major CRC investment in DAB software now offered as free open source project
- Will you participate to the future enhancements ?



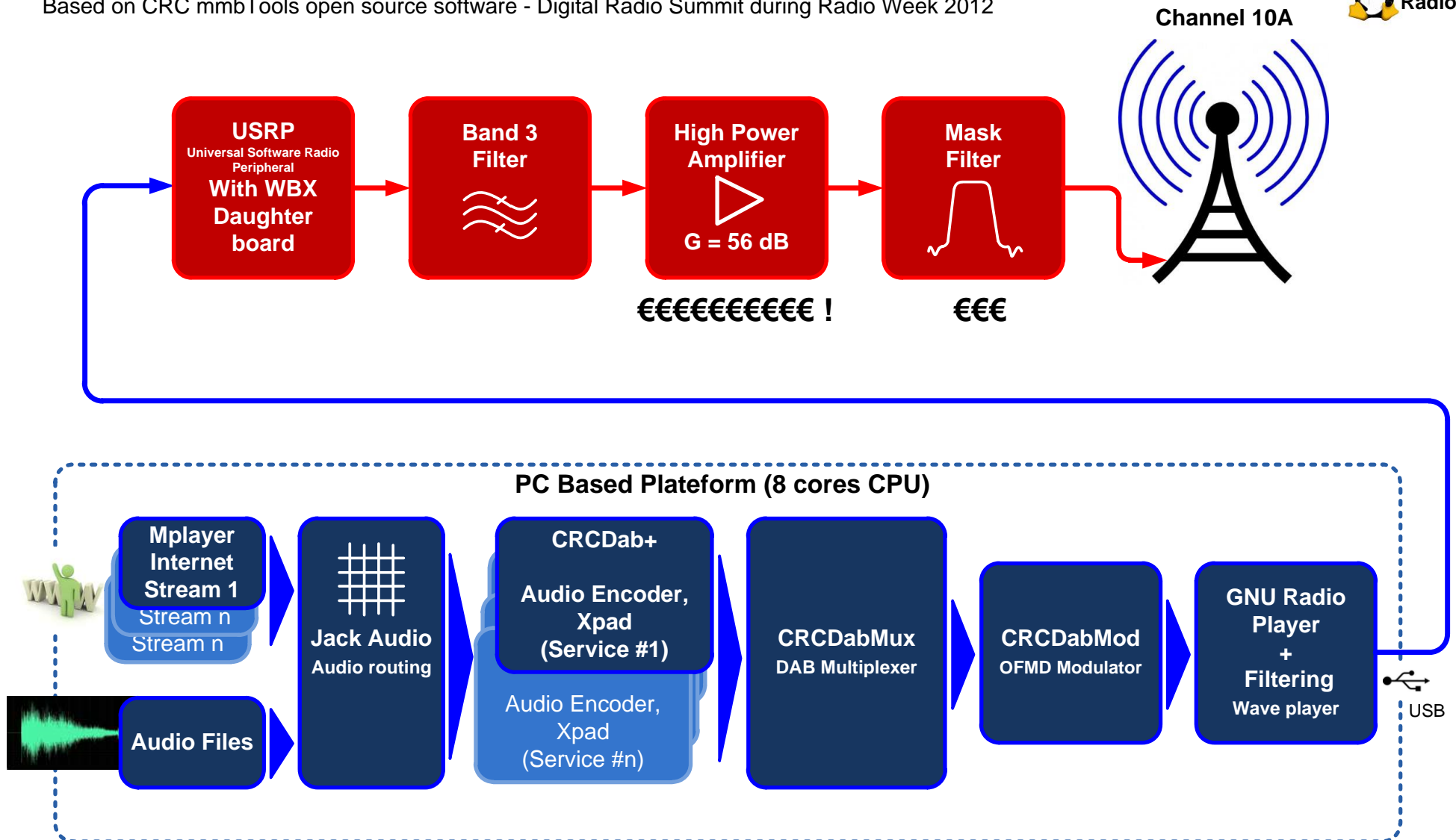
DAB+ system in-a-box 2012 – City Coverage



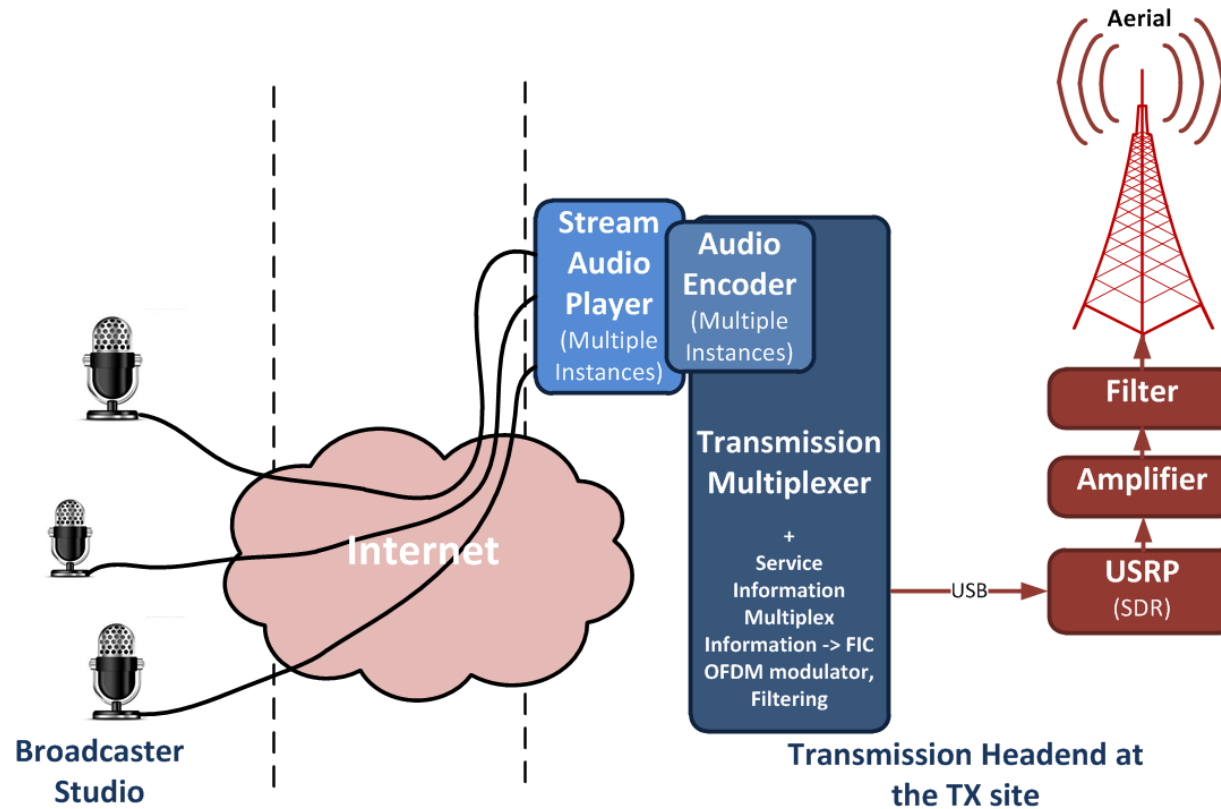
1700 Watts EIRP system
~20'000€ Investment (CAPEX)

Digital Audio Broadcasting Transmit Chain

Based on CRC mmbTools open source software - Digital Radio Summit during Radio Week 2012



Reduced operational costs



- All on broadcast site
 - Single site (may be completed by micro sites for hole coverage)
- Broadband Internet access

Local urban islands (\neq regional)

DAB Islands Scenario



Station A
Station B
Station C
Station D



Station E
Station A
Station F
Station C

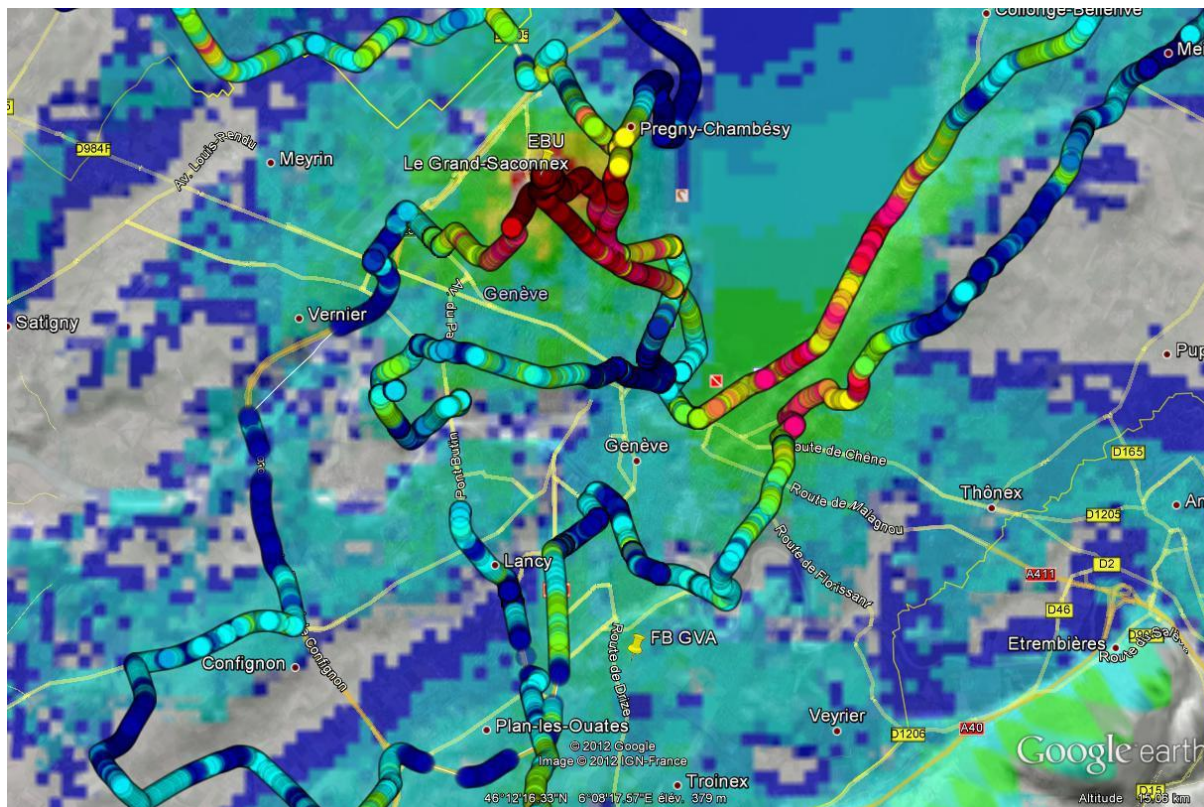


Station G
Station H
Station I
Station J

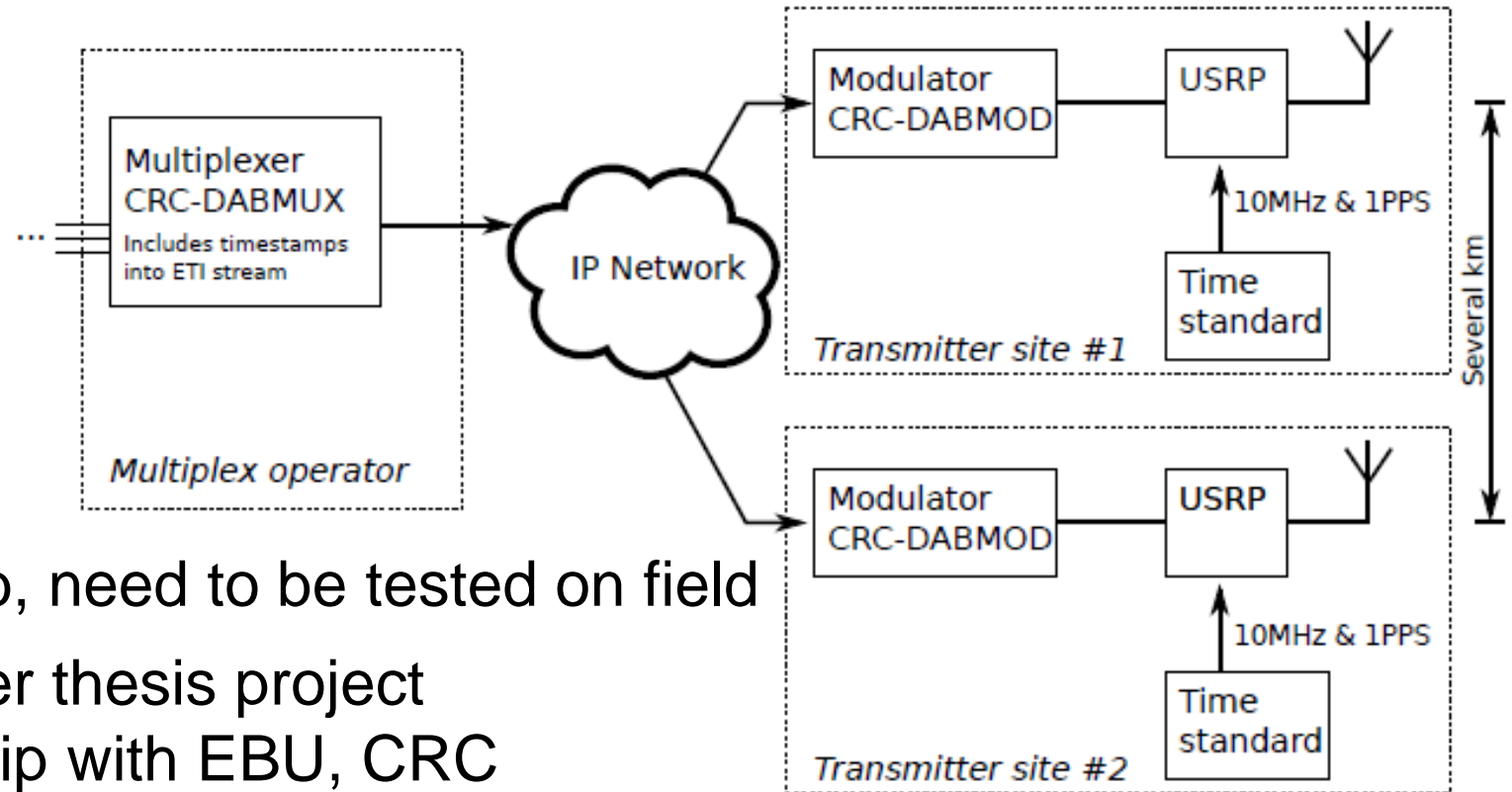
Multiple frequencies

Coverage Planning

- Planning using Longley-Rice model (ITM)
- NASA SRTM free terrain model
- Radio Mobile free planning software (<http://www.cplus.org/rmw/>)



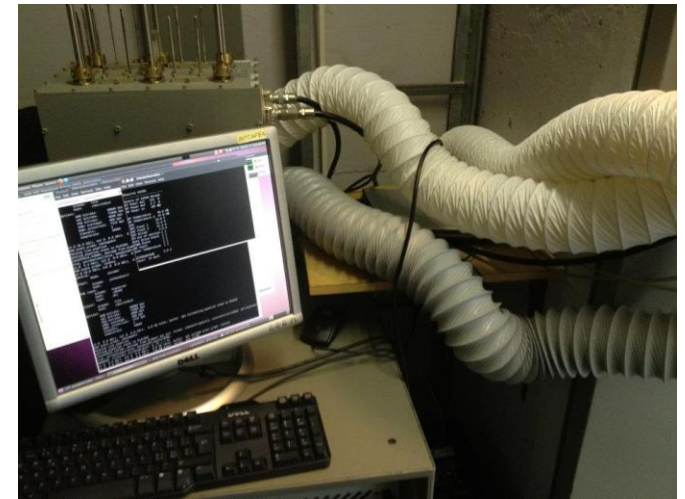
SFN is coming



- Works in lab, need to be tested on field
- EPFL master thesis project in partnership with EBU, CRC
- Modification of CRC mmbTools
- Open source: mpb.li
- Objective: complete coverage holes

Next steps

- Use of modern DAB transmitters/amplifiers with EDI interface
- Still CRC encoders/multiplexer, requires EDI development
- Higher efficiency: from 20% to (expected) 40%
- Much higher investment but lower operation costs (electricity) over lifetime and greener



DAB-in-a-box system gets hot !

The Swiss case

The Swiss Case

- Association of non commercial radio UNIKOM and company Digris applied for local DAB licences (4th layer)
 - June 2013: Swiss OFCOM has granted a licence for building local islands coverage to the company Digris
 - 75% of the investment cost is covered by OFCOM
 - Association LIMUS with the radio stations, Digris capital share
 - Pilots islands over Geneva and Zurich (2014)
 - Other islands after depending on radio interests
 - ~80 radio stations have shown interest
 - Opendigitalradio.org non-profit association to maintain, develop CRC open source code, document technology
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Difficulties

- Transmission sites acquisition
 - Radiation limits: 6V/m in Switzerland for near houses
 - Transmitter site planning and construction is not easy, requires expertise and experience
 - Coordination of all stakeholders in the project
 - New concept, have all of them to understand, agree
 - A lot of work
 - Will know more after pilot phase
 - But the same system runs well in Copenhagen for 2 years (Kanal Plus ensemble)
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Conclusion

- Community stations have a solution and get interested
=> DAB+ is now possible for the whole radio ecosystem
but
- Such projects require expertise, a lot of work for coordination, site acquisition and construction
- Investment for the power amplifier, filter, antenna system
- Free software: free as in freedom of speech, not free beer !





Thank you

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More information on
www.opendigitalradio.org
wiki.digris.ch
mmbtools.crc.ca