Local DAB+ broadcasting using mmbtools

Mathias Coinchon
CRC-mmbtools

- Software Project started by Communication Research Center
- CRC-DabMux: DAB multiplexer
  CRC-DabMod: COFDM modulator
- Transmission using Ettus Software Defined Radio Peripheral
- First demonstrated at IBC in 2007
- Open sourced (GPL licence)
- 2013: Project dropped by CRC
Digital Audio Broadcasting Transmit Chain
Based on CRC mmbTools open source software - Digital Radio Summit during Radio Week 2012

USRP
Universal Software Radio Peripheral
With WBX Daughter board

Band 3 Filter

High Power Amplifier
$G = 56\text{ dB}$

Mask Filter

Channel 10A

PC Based Plateform (8 cores CPU)

Mplayer Internet Stream 1

Jack Audio Audio routing

Audio Files

CRCDab Audio Encoder, Xpad (Service #1)

CRCDabMux DAB Multiplexer

CRCDabMod OFMD Modulator

GNU Radio Player + Filtering Wave player

Audio Encoder, Xpad (Service #n)

USB

Band 3 Filter

High Power Amplifier

Mask Filter

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ODR-mmbtools

- Fork of CRC-mmbtools: ODR-DabMux, ODR-DabMod
- Zero-MQ interface (more flexible)
- Monitoring
- Config files and console

- Fdk-aac-dabplus: DAB+ encoder (HE-AAC 960) (toolame for DAB, MPEG Layer II)

- Maintained by opendigitalradio.org
- https://github.com/Opendigitalradio
On air in Geneva (since May) and Zurich (since August)

- Simple and compact setup. No headend
- Digris SA holds the licence
- 13 radio stations per multiplex

Zurich: 1kW ERP
Geneva: 5kW ERP
Under development (not yet live on air)

- Dynamic Label Service (DLS, text service)
- Slideshow, added by CSP in Italy
- Single Frequency Network using GPSDO
- Mixing commercial equipment (gates air) with open SDR.
- Distributed encoders in studio (tested on Raspberry Pi)
- Multiple multiplexes on one SDR peripheral
Thank you

Mathias Coinchon
coinchon@ebu.ch

More information on
www.opendigitalradio.org