



Radio Broadcasting

opendigitalradio.org

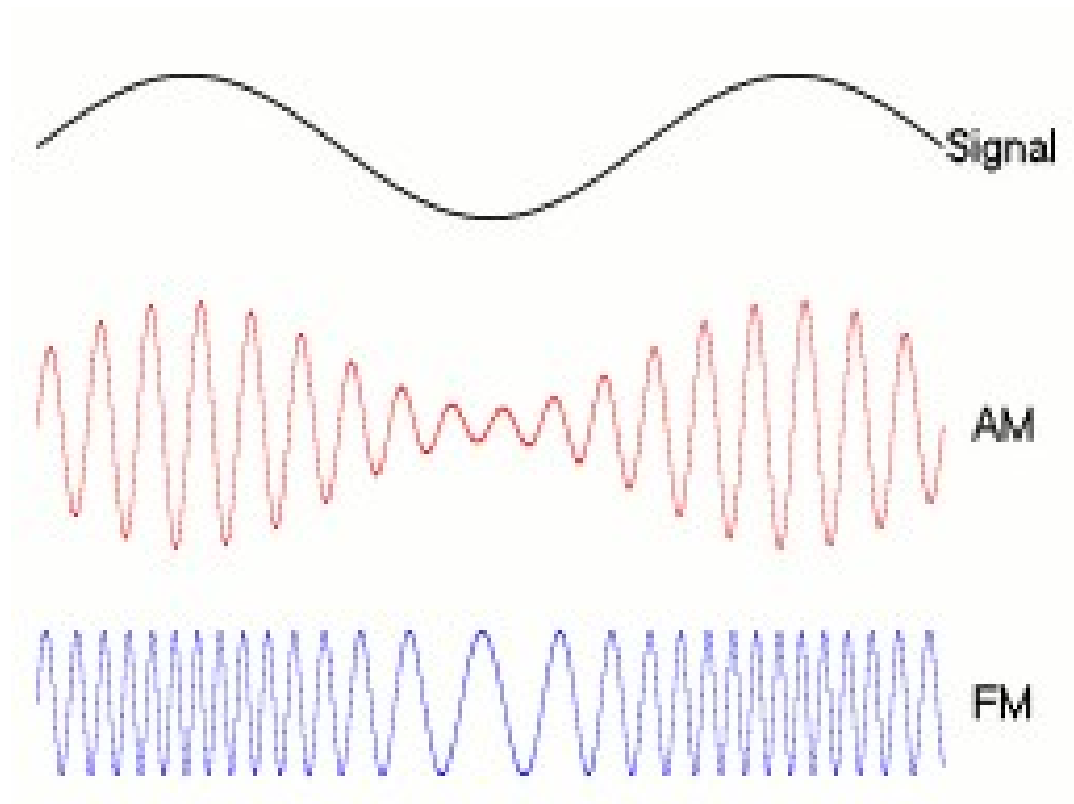
26C3

Radio Broadcasting is (still) cool

- **Direct access, direct communication**
 - No intermediate operator or system
- **Free to air**
 - No subscription needed
- **Cheap and simple reception device**
- **Anonymous listening**
- **Efficient for one-to-many delivery**

Caveat: Spectrum is not as free as Internet, licence for broadcasting is very difficult to obtain in many countries :-)

Analog radio broadcasting

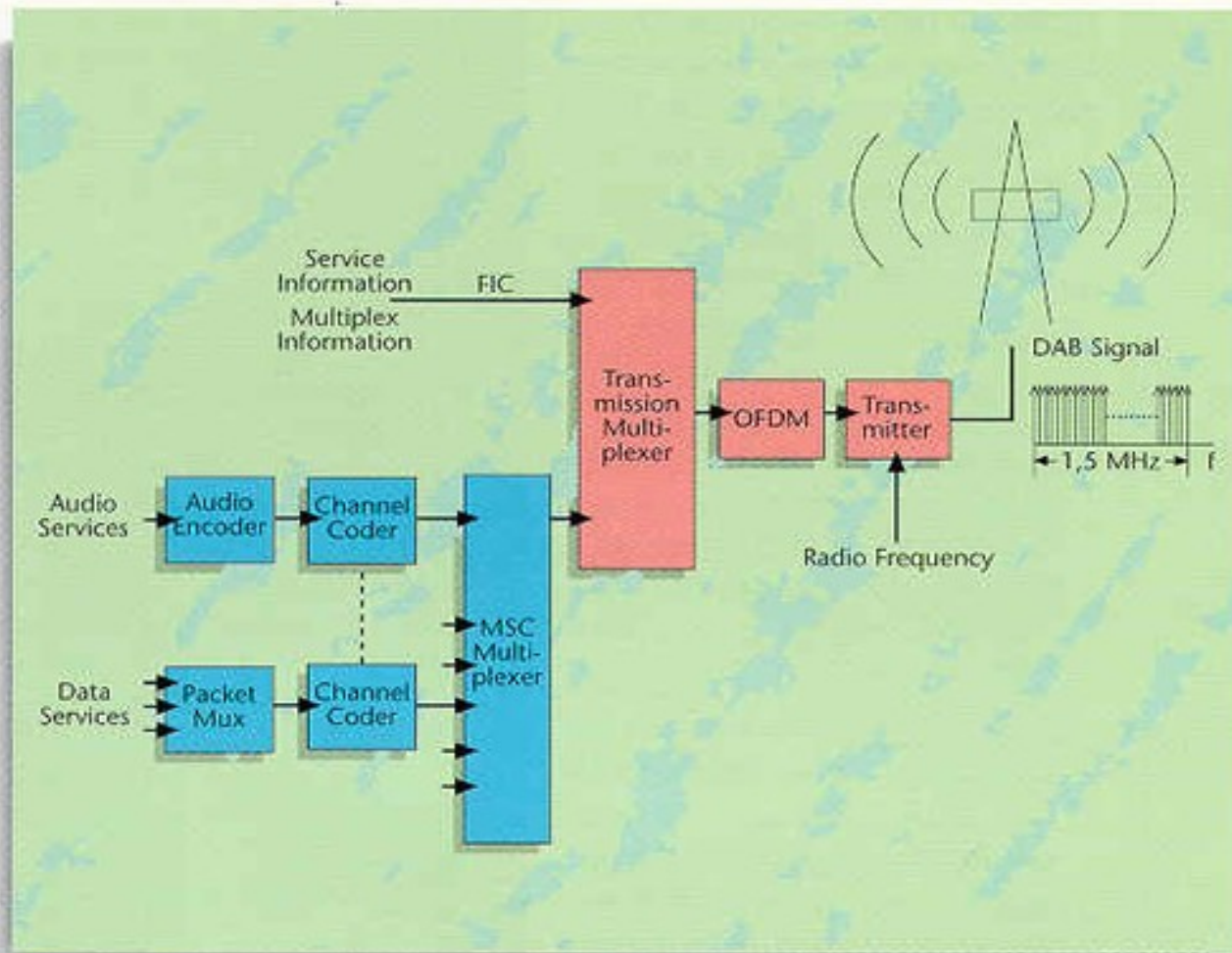


Digital Radio Broadcasting

- **DAB, DAB+, T-DMB: Digital Audio Broadcasting**
 - In VHF Band III (174-230 MHz), 1.5MHz blocks, OFDM, ~2Mbits/s
 - Group of programs, single frequency network, robust until 300km/h
 - Mp2, AAC+, H.264, slideshow, EPG, text, ...
- **DRM30 (Digital Radio Mondiale)**
 - Replacement for AM bands, 5-20kHz blocks, OFDM, <40kbps
- **DRM+**
 - In FM band or band I (47-68 MHz), 100kHz blocks, OFDM, <168kbps/s

DVB-T, DVB-H can also be used to transport radio programs

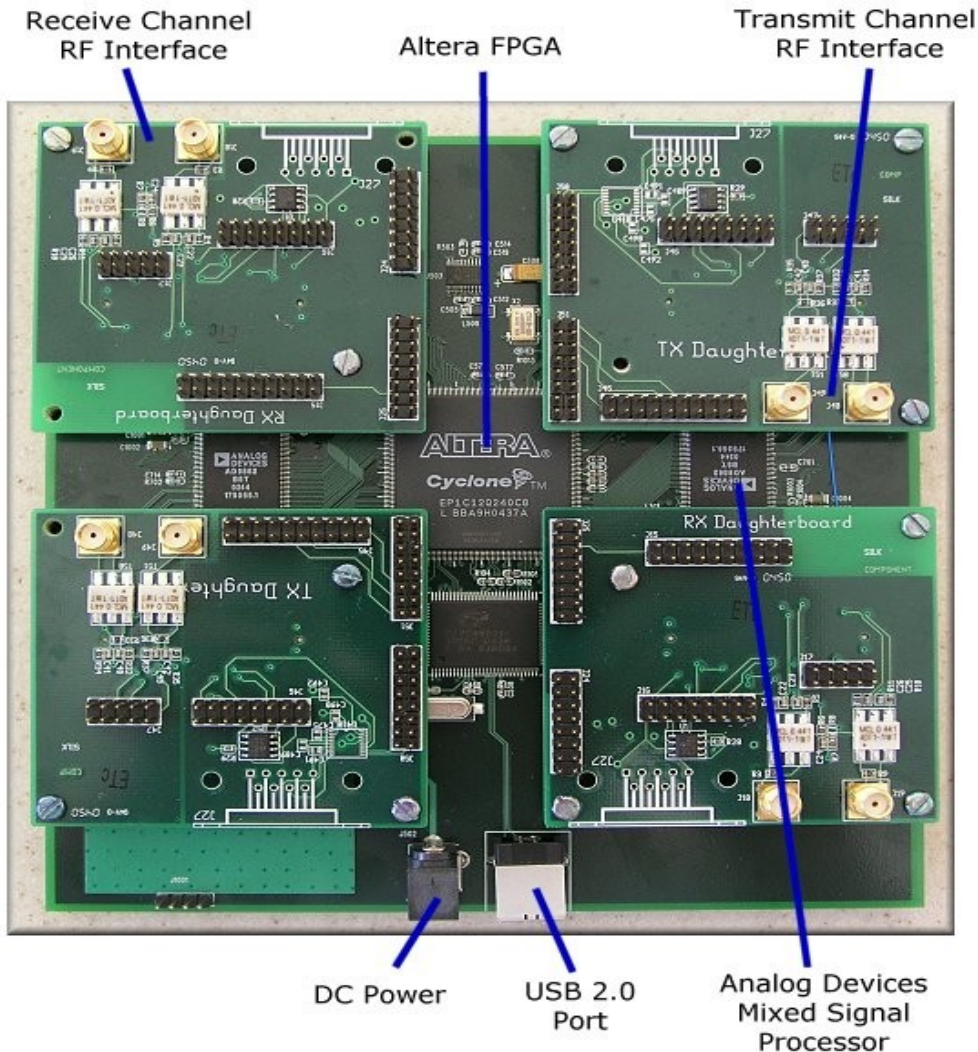
Digital Audio Broadcasting infrastructure



Very costly equipment !
(~100'000€)

Fig. 1: Generation of the DAB Signal

Democratisation of software radio



USRP (700\$)
Gnuradio

Universal Software Radio Peripheral



- **CRC MMBTools: Software defined DAB tools**
 - Multiplexer, OFDM Modulator, online encoders
 - <http://mmbtools.crc.ca>
- **Enable democratisation of digital radio broadcasting**
 - Experimentation, development, community radio

WORKSHOP ON RADIO BROADCASTING

- **DAY 3: 14H00-16H00 Room A03**
- Learn more about digital radio and software defined radio
- Build your own software FM, DAB transmission using USRP



For more information...

- <http://www.opendigitalradio.org>

- Techniques, tips, tricks for radio broadcasting
- Syndication of free/open developments on radio broadcasting



- Mailing list:
<https://lists.saitis.net/cgi-bin/mailman/listinfo/openradio>