



Digital Radio Broadcasting Public Radio in Turkey

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2. To get radio content, receiving from,
3. TRT DAB Plot Project, DAB trial
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 - Legal Issues - Regulation for Radio
 - from analog to digital
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TRT Broadcasts

- Televisions



TRT Broadcasts

- National Radios



TRT Broadcasts

- Regional Radios



- International Radios



to get radio content, receiving from,

radio contents production and consumption media

- Terrestrial Broadcasting



- IP-Based Production for Web/Mobile
 - Social Media



content & management

- Static & Dynamic RDS Data
- EWS Pilot-Test Project
- e-radio;
 - music-content transmission control systems,
 - broadcast flow planning
 - Advertising, Production On Air Payout and copyright
 - Simultaneous RDS, Mobile and Internet-media content delivery (3 channels output)



Terrestrial Broadcasting

- Analog Radio; FM, AM (LW, MW, SW)
 - TRT- FM
 - # Tx: 1149, ERP: 11.5MW, Coverage(pop): 99%
 - TRT-AM
 - # Tx: 11, OP: 4.2 MW,
- Digital Radio;
DAB, DMB, DAB+, DRM, HD-Radio,...
 - TRT DAB PILOT PROJECT

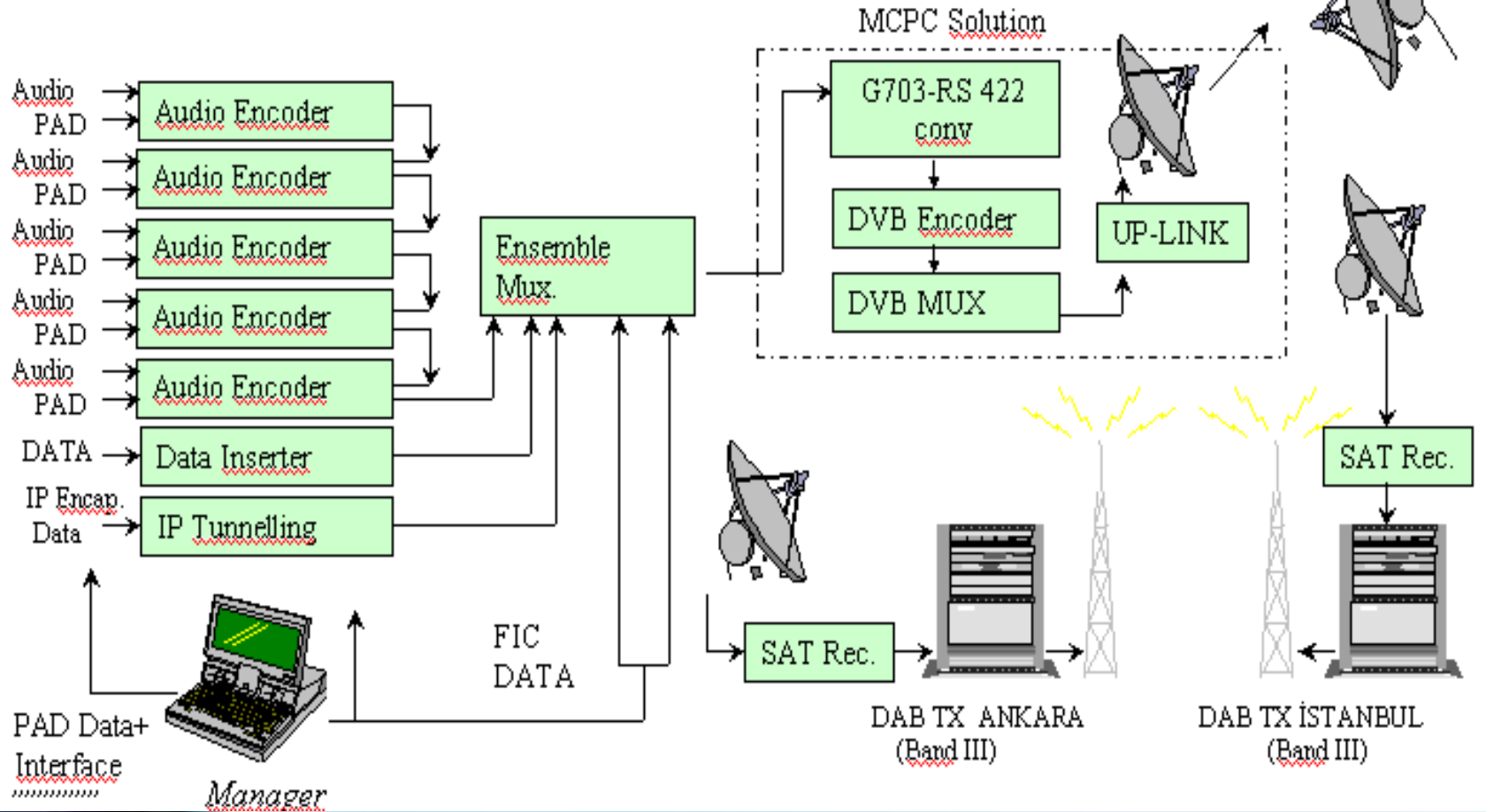


DAB PILOT PROJECT in TURKEY

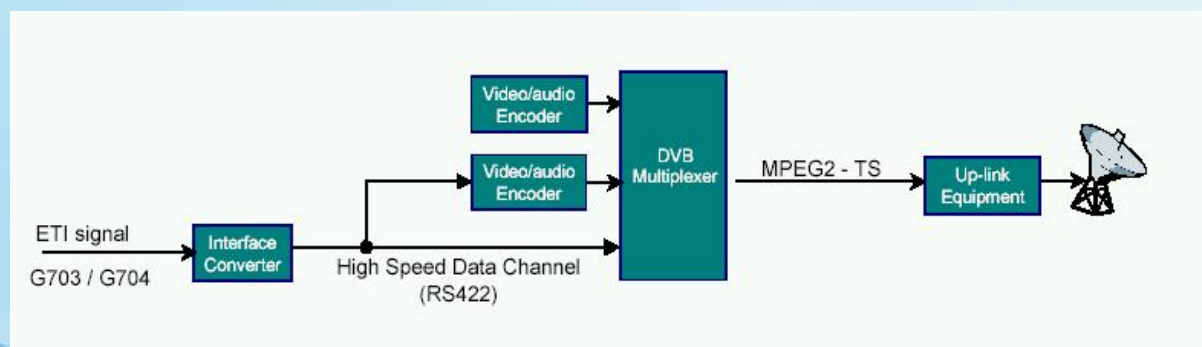
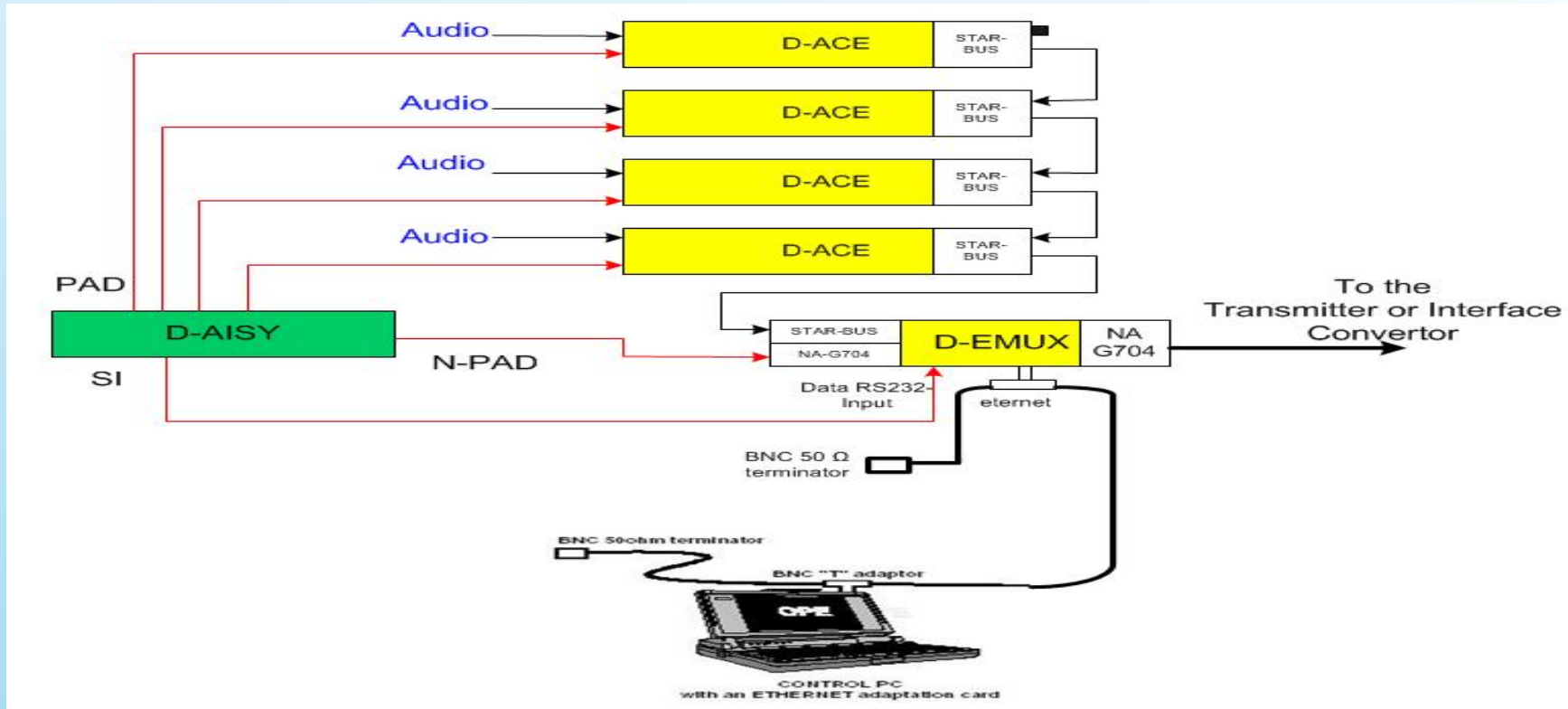
- Turkish Radio Television Corporation (TRT), as the public broadcaster, started to transmit DAB test signal on March 2002 in Ankara, the capital city of Turkey, with the studies within R&D Department .
- First, a 250W DAB transmitter, a directional antenna, 10 dB antenna gain, 40 meter antenna height were selected in the system. This transmitter covers the Ankara city center and reaches approximately 2 million people.



2 VERİCİLİ TRT- DAB PİLOT YAYINI PRENSİP ŞEMASI (TRT DAB PILOT PROJECT OUTLINE WITH 2 TRANSMITTERS)



TRT DAB Architecture



TRT DAB Pilot Project

- An SFN (Single Frequency Network) application had been planned in Ankara with the addition of a 1kWatt transmitter.
- In order to increase the awareness of DAB, 1 kW transmitter has been transferred to Istanbul, the biggest city of Turkey.

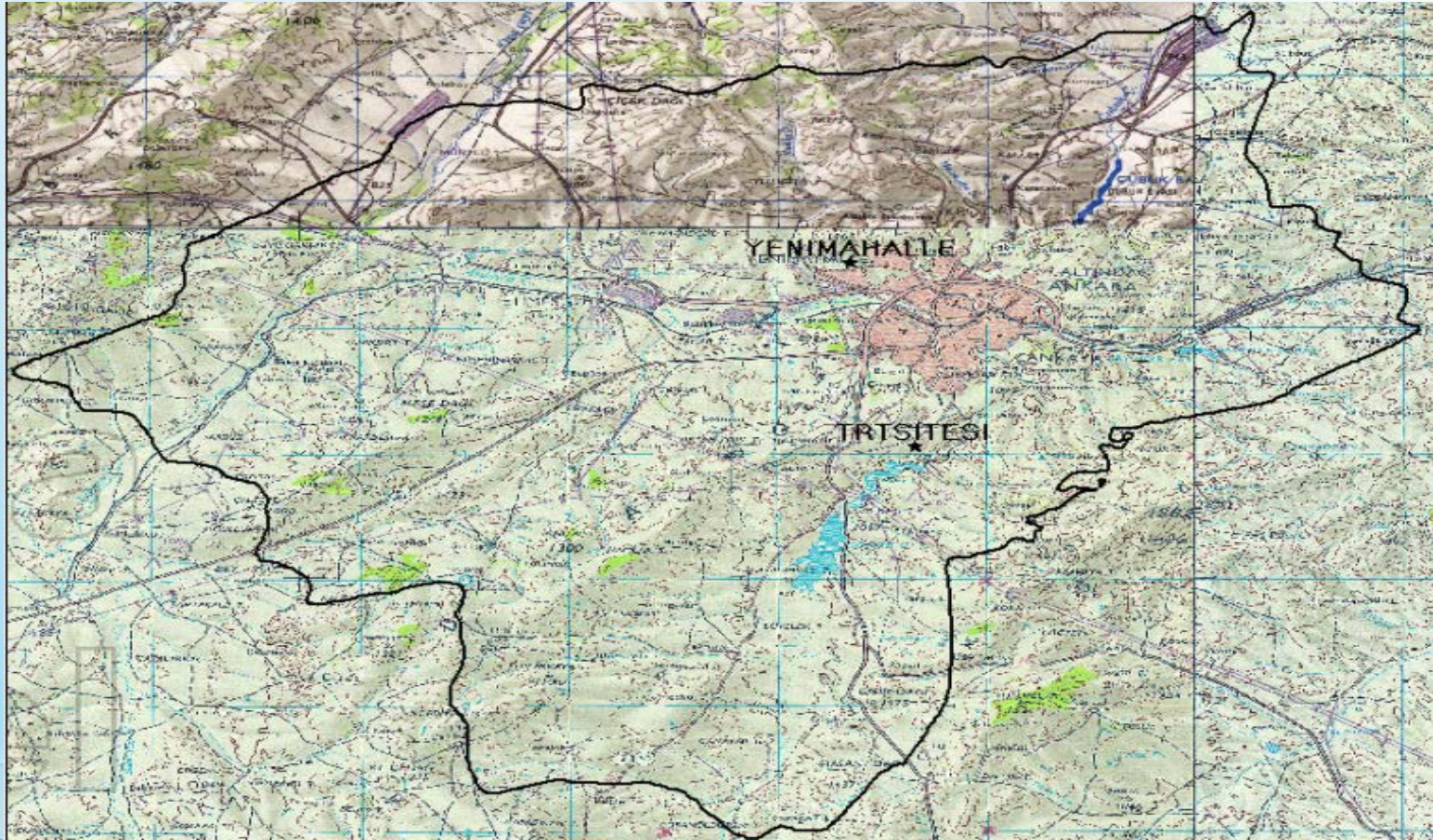


TRT DAB Pilot Project

- TRT has also planned to distribute DAB ETI signal via existing MCPC DVB-S infrastructure.
- After the distribution of DAB ETI signal and the installation of the 1 kW transmitter in İstanbul, TRT DAB signals reached to more than 6 million listeners.
- In addition to radio programs, SI (Service Information) PAD (Program Associated Data) including the broadcasters name, channel name and program type are also transmitted on digital radio together with
Non-PAD data such as weather and
road/traffic information

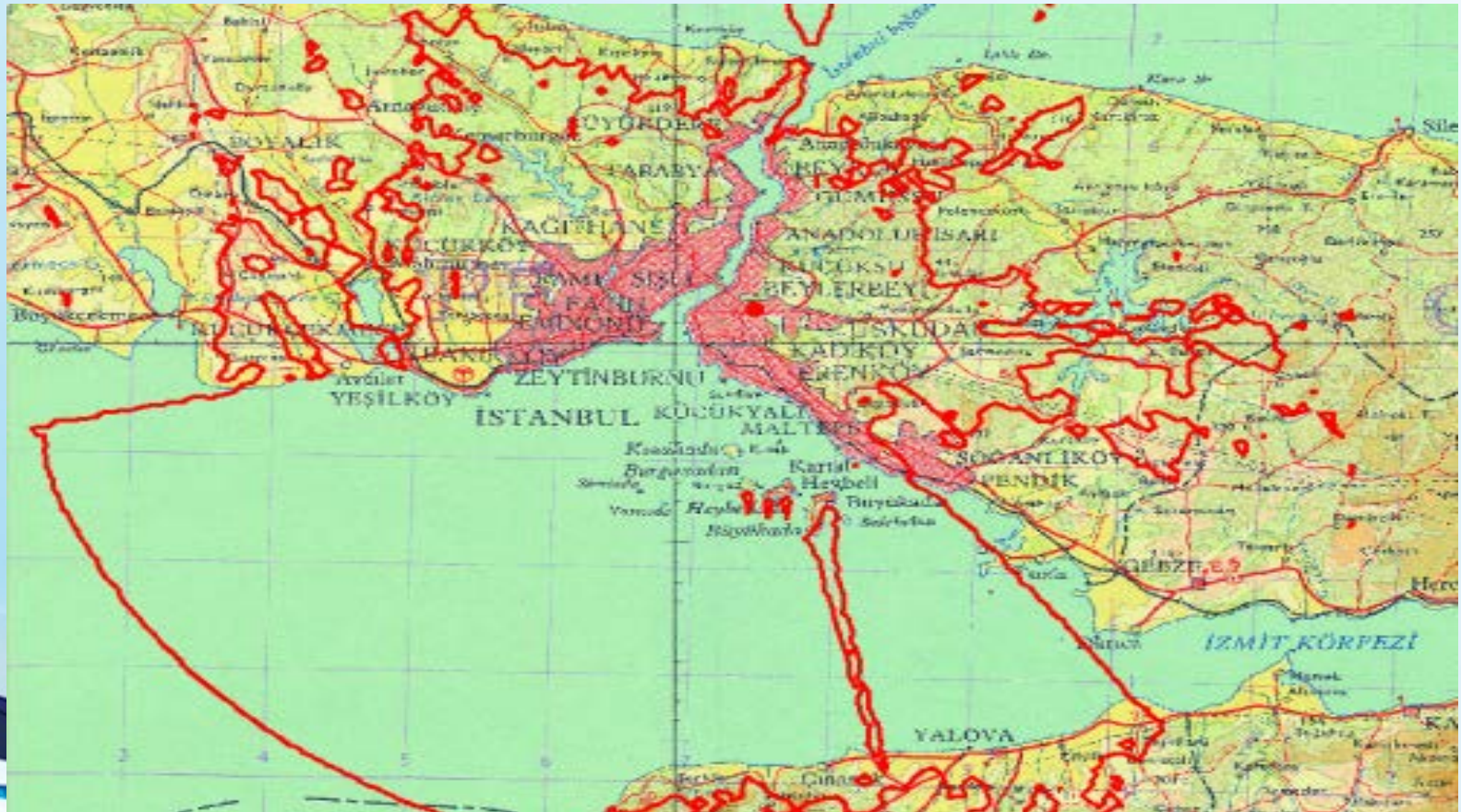


The DAB Coverage Map of Ankara



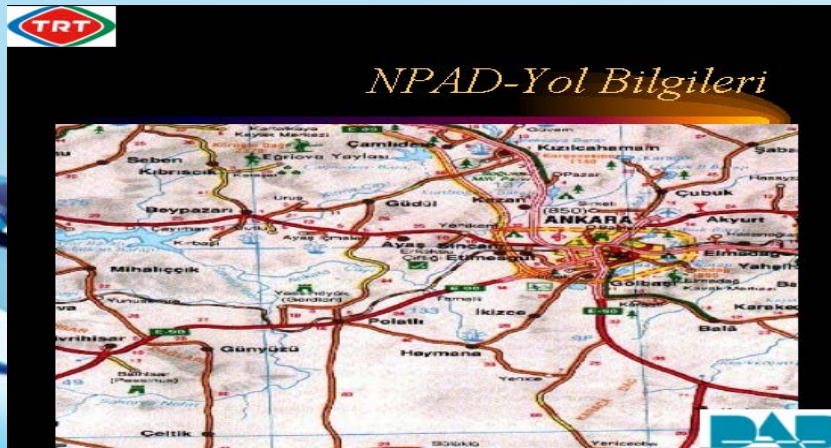
TRT DAB Pilot Project

The DAB Coverage Map of Istanbul



TRT DAB Pilot Project

TRT has also bought DAB IP Data Tunneling equipment for broadcast streaming services and is ready to develop new services based on IP, one of the more powerful and attractive multimedia features of DAB. The equipment is able to manage several IP services on the same platform. The IP services may be broadcast in one or more N-PAD channel.



DAB Trial-Summry.

The R & D department of TRT (Turkish public broadcaster), started DAB test in 2002 and has aired DAB test transmissions broadcasting four simulcast services in Band III and covering the capital, Ankara. A second transmitter was also planned for Istanbul. At that time, the prices for receivers were too high. TRT was the only broadcaster to have a DAB signal, and there were no receivers in the market. So after testing SFN with two transmitters one of which was 1 KW and the other of 250 W, the trial ended.

System Parameters

- **Radio-1: 224 kbit/s, Radio-2(TRT-FM): 192 kbit/s**
- **Radio-3 (classic music): 224 kbit/s, Radio Tourism: 192 kbit/s**
- **Channel Coding : Protection Degree : 4 , Coding Rate R: 0.64,**
- **Modulation : COFDM Mode I, Number of Carriers: 1 536**
- **Total Modulation Interval :1.246ms, Guard Interval :246us**
- **Transmission Frequency : VHF III (12B)**
- **Transmission Power : 250 W, ERP :34 dBW, +1 KW, ERP:40dBW**



Terrestrial Broadcasting in Turkey, in Future from analog to digital

- Transmission and operating costs will drop with the digital radio
- DAB/DAB+ gives the opportunity to have many thematic radio channels.
- Multi Media Public Services, Free-to-air, high quality audio, robustness and mobile radio reception.
PAD & NPAD, Smart content
- Local and Regional Broadcasters to support
- Transmitter power and number to reduce
- Effective and efficient frequencies to use
- No interference



Regulation and Spectrum

Legal Issues for radio

- According to the Act #6112 the frequency allocation tender for "radio" will be in 6 months after analogue switch off of terrestrial television, which is planned to be on 3 March 2015. In the act, it is not clear whether this "radio" means analogue or digital.
- It is expected that the following issues need to be clarified by [RTUK](#); the Supreme Council for Radio & Television in Turkey
 - Frequency planning and allocation for analog (FM), or digital and/or analog + digital ?
 - digital radio (DAB+/DMB, ..?) licenses issued to existing FM license holders?
 - spectrum: band III (VHF) some L-band ?



Conclusions

As the public broadcaster of Turkey, we believe that we have to be well prepared for the digital World

- prepare a realistic plan ??? RTÜK
- Funding for parallel broadcasting ; FM and DAB or DAB+ ??? BO
- The right choice, be in step with Europe, ??? WorldDMB, RTÜK

TRT, ready for the digital terrestrial broadcasting and plans to start again DAB+ tests.



Teşekkürler Thank You

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