

Media&Broadcast DVB-T-Roll-Out in

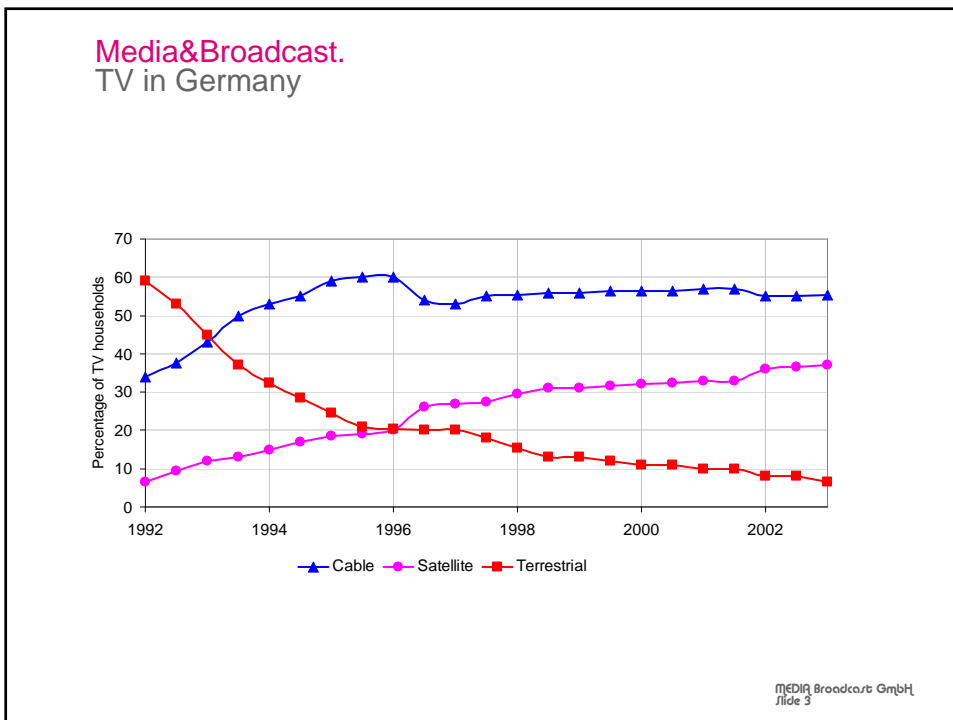
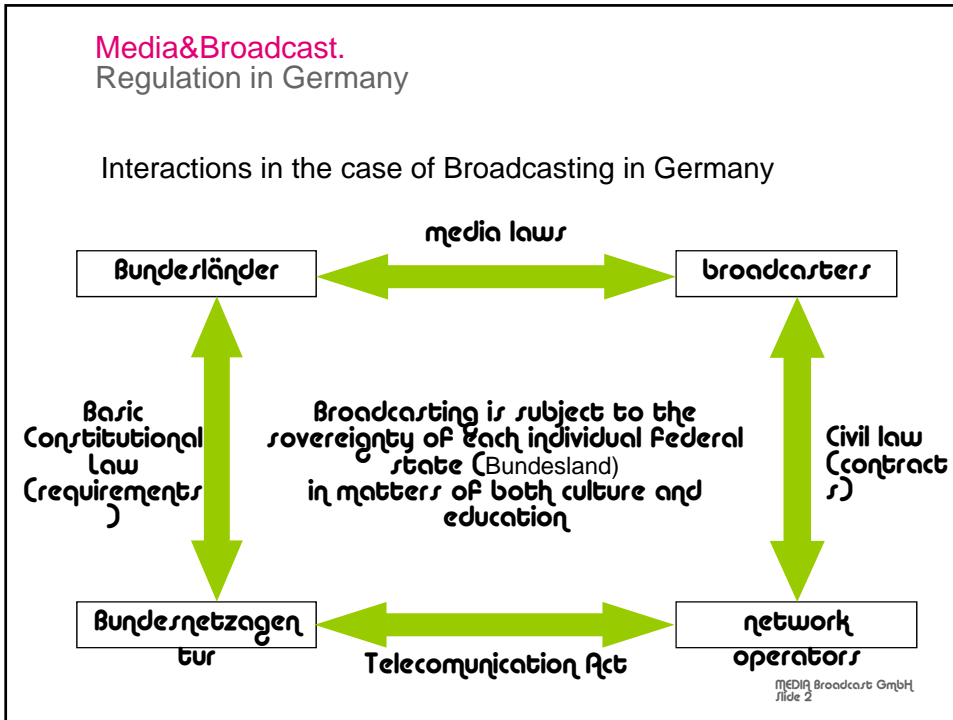


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Media&Broadcast. Network - Overview

1. Introduction
2. DVB-T Basics
3. Network Roll-out
4. Summary

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Network Planning - Basics.

Planning Tool

```

    graph TD
      Tx[Tx Databases] --> CP((Coverage planning))
      Topo[Topo / Morpho] --> CP
      Wave[Wave propagation] --> CP
      Systems[Systems] --> CP
      Measurements[Measurements] --> CP
  
```

- Raster / cluster data
 - 5" by 5" (about 150 m by 100 m)
 - land-usage classes (e.g. for building penetration loss)
- Propagation Model Kuhlmann-Eibert
- combined field strength: Inm-method
- synchronisation: "first signal above threshold"

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DVB
Digital Video Broadcasting

DVB-T: Das ÜberallFernsehen

Digital Video Broadcasting – Terrestrial (DVB-T). What is DVB-T?

- Digital Video Broadcasting - Terrestrial (DVB-T) is a digital system for transmitting TV signals via antennas. To receive DVB-T signals, users need only a single additional device, the "set-top box", which is placed within the circuit between the user's antenna and TV.
- In addition to "regular" programming, DVB-T offers many new services - for example, media services such as multimedia CityGuides and business channels featuring top regional news headlines.
- Modern digital technology brings a whole new world of variety to TV: lively, colorful, entertaining, interesting and educational. For both home and mobile viewers.

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Digital Video Broadcasting – Terrestrial (DVB-T). Advantages of DVB-T.

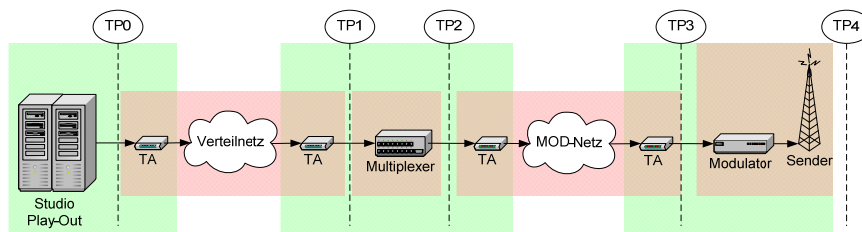


DVB-T: DasÜberallFernsehen



- **Programming and variety:** With the new digital technology, users can receive well **over 20 channels** via antennas.
- **Transmission quality:** DVB-T provides significantly **better picture and sound quality** than existing analog systems.
- **Portable reception:** TV reception without any TV connection socket or cable. With **simple room or device-mounted antennas**, users can receive DVB-T digital signals almost anywhere - at home, in the garden ... even on the go.
- **Mobile reception:** "Mobile" reception means "mobile" - **digital TV in moving cars, buses or trains**. This opens the way to new applications that would be inconceivable with regular TV.

Digital Video Broadcasting – Terrestrial (DVB-T). Reference System DVB-T.



function
 location

DVB-T introduction in Berlin.

Schedule: introduction in three phases.



DVB-T: DasÜberallFernsehen



Nov. 02

Febr. 03

Aug. 03

DVB-T was introduced in Berlin at the initiative of broadcasters and Medienanstalt Berlin-Brandenburg (Berlin-Brandenburg media authority), and the introduction consisted of three phases:

1st phase: Starting in November 2002, regular digital broadcasting of a **first group of eight channels** (four public and four private channels) began. Analog broadcasting of these channels also continued.

DVB-T introduction in Berlin.

Schedule: introduction in three phases.



DVB-T: DasÜberallFernsehen



Nov. 02

Febr. 03

Aug. 03

DVB-T was introduced in Berlin at the initiative of broadcasters and Medienanstalt Berlin-Brandenburg (Berlin-Brandenburg media authority), and the introduction consisted of three phases:

2nd phase: at the end of February, **analog broadcasting of the four private channels was switched off**; from that time on, these channels were available only through digital reception. Analog broadcasting of the public channels was continued, at **lower broadcast-power levels**. The capacity that became available when the four analog channels were taken off the air was then used for transmission of the new digital service.

DVB-T introduction in Berlin.

Schedule: introduction in three phases



DVB-T: DasÜberallFernsehen



DVB-T was introduced in Berlin at the initiative of broadcasters and Medienanstalt Berlin-Brandenburg (Berlin-Brandenburg media authority), and the introduction consisted of three phases:

Nov. 02

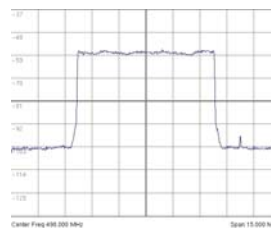
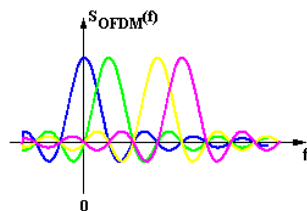
Febr. 03

Aug. 03

3rd phase: On 4 August 2003, all remaining analog broadcasting was switched off, bringing introduction of DVB-T in Berlin to a successful completion.

Media&Broadcast. DVB-T Modulation

Coded Orthogonal Frequency Division Multiplex (COFDM) ist ein digitales Modulationsverfahren, welches das Modulationsverfahren **OFDM** um eine **VorwärtsFehlerkorrektur** ergänzt.



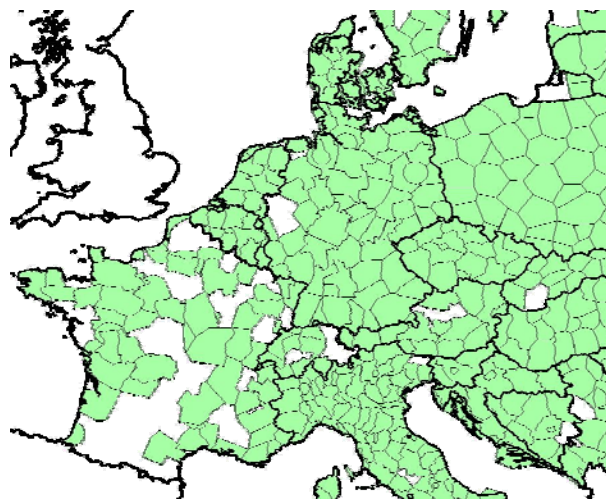
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 DVB-T Parameter

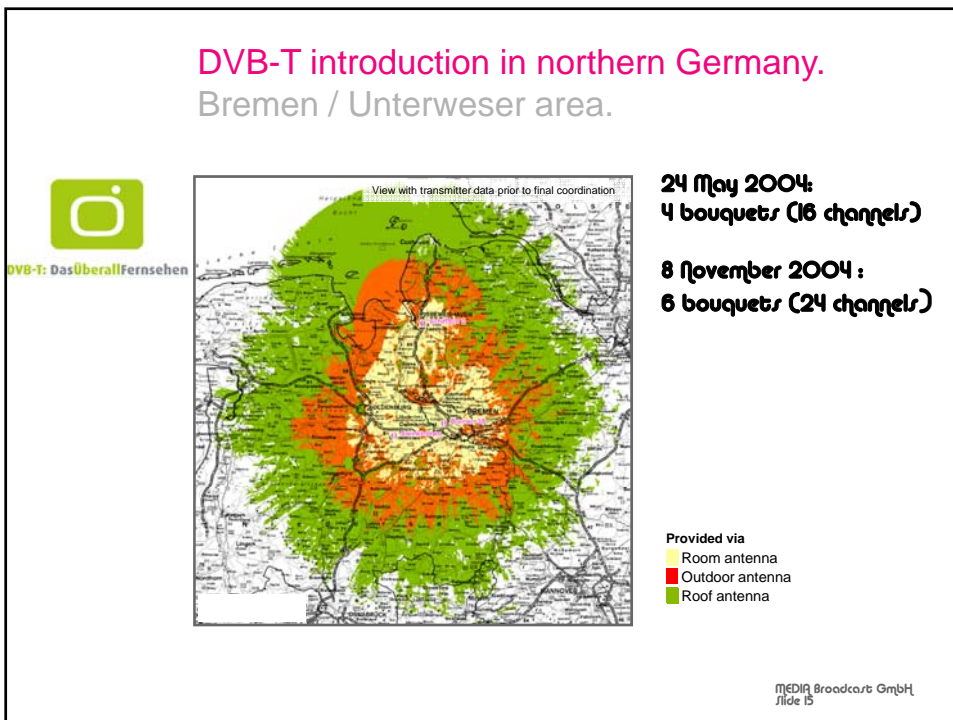
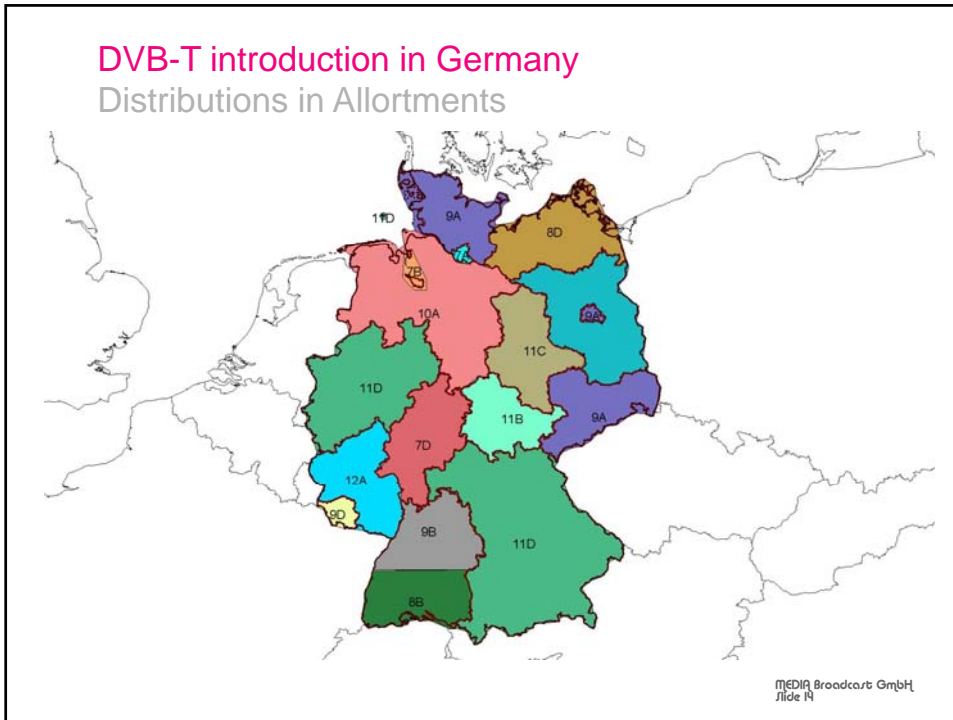
Examples of DVB-T parameter use for various services

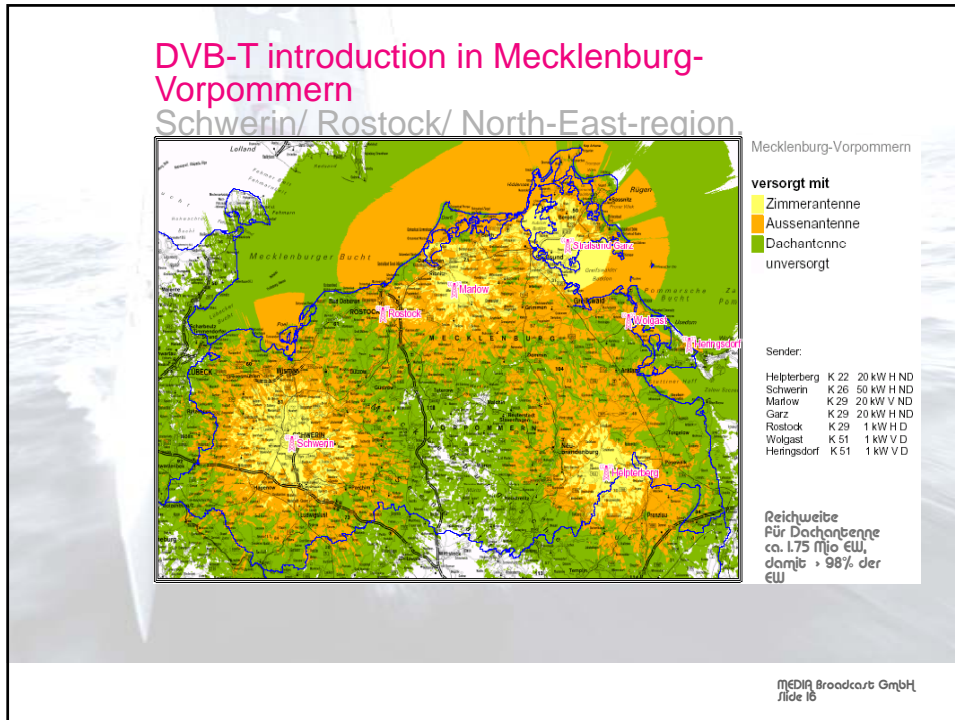
Bit rate	Modulation	Code rate	Application
5 Mbit/s	QPSK	1/2	Channel featuring a high level of interference
15 Mbit/s	16 QAM	2/3	Wide area portable reception
26 Mbit/s	64 QAM	3/4	Maximize data rate in a clear channel

DVB-T introduction in Germany

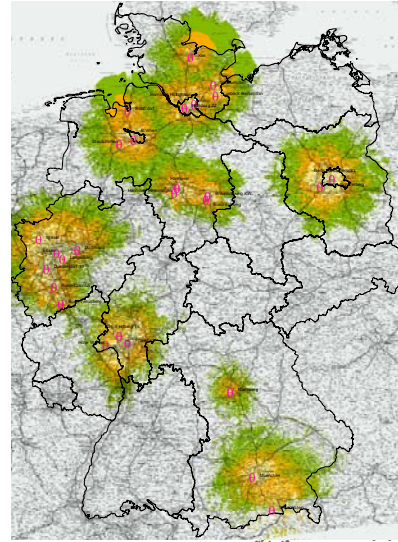
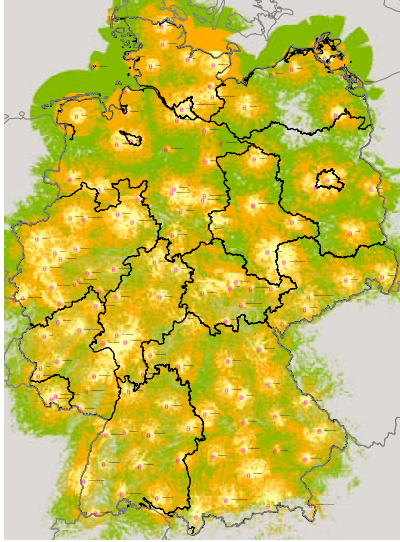
Distributions in Allortments







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 Further Roll out DVB-T in Germany

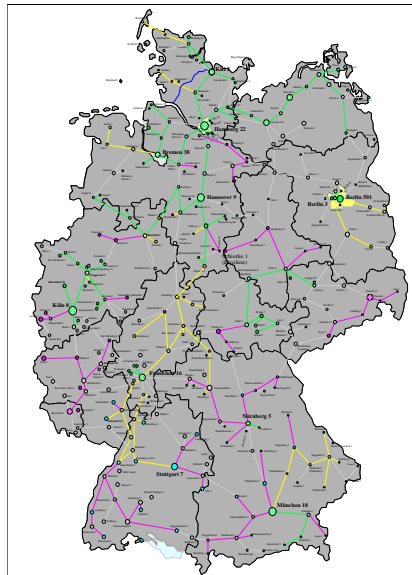


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Fernseh-Modulationsnetze Deutschland



- DigNet
- DVB-T in Betrieb
- DVB-T in Planung 2009
- DVB-T in Planung 2007/8
- Sender ARD
- Sender ZDF



- Netzknoten i.B.
- Sender i.B.
- Relaisstation

Overview of Modulationlines

DVB-T. Receiver Equipment



DVB-T: DasÜberallFernsehen

