Slide 1

The situation of digital broadcasting in Hungary

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8 June 2005
Skopje

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History of the Hungarian DVB-T (1.)

- 1999: research and experimental broadcasting start at Antenna Hungária
- 2001: installation of the first two digital transmitters
- Transmission technology experiments, examination of stable and mobile receiving possibilities
- Multimedia and interactivity tests
- Transmitting examinations of the simulcast broadcasting on the existing analogue antenna
- Antenna allocation plans
- DVB-T repeater installation
- Experimental broadcasting

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History of the Hungarian DVB-T (2.)

- Marketing activity – aim: propagation of general knowledge
  - DVB-T (2001) and digital broadcasting films (2003; DVB-S, DAB/DRM, refreshed version of DVB-T)
  - DVB-T Conferences (2001, 2002)
  - DigiTAG seminar
  - Handouts, brochures

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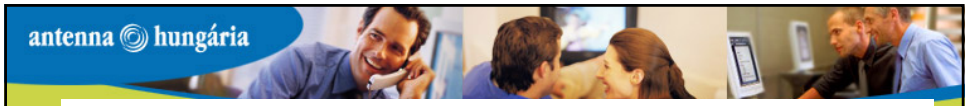
Governmental decision about DVB-T

- 10 March 2005 goverment decision on government's main tasks for digital terrestrial television switchover
- The government forces the switchover to happen as soon as possible
- From 2007, 3 multiplexes will be broadcast nation-wide on the basis of the frequency possibilites what will be decided on the ITU Regional Radio Conference in 2006
- In the beginning the multiplexes will broadcast free-to-air to promote the spread of DVB-T receivers
- In the multiplexes, capacity reserved for interactive applications.
- The simulcast period has to be continued until the population coverage reaches 97%
- The switch-off of the analogue transmitters will be made step-by-step
- The planned date for nation-wide analogue switch-off is 31December 2012



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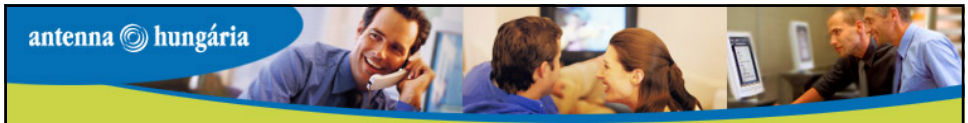
Hungarian DTT roadmap

Governmental decision — **DVB-T on three multiplexes** — **End of analogue broadcasting**

2004	2005	2006	2007	2008-2010	2012
• Start of pilot project O Preparation of governmental decision O Preparation of ITU planning demands O International frequency coordination	**•Governmental decision** O Regulation on the level of laws O Network plan O Decisions on telecommunication regulations O Preparation of open competition procedure	**•Invitation of tenders for 3 multiplexes**	**▪ Start of three new nation-wide multiplexes „island-by-island”** o Enlarging network plans based on ITU’s new digital plans o Enlarging the network of the multiplexes o Development of interactive and multimedia applications o Cosideration of supporting possibilities	**▪ Enlarging the network of three multiplexes** o Development of interactive and multimedia applications o Invitation of tenders for more multiplexes	**• Analogue switch-off in phases** O Make decision about the utilization of the channels getting free



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The actual situation in Hungary

- From 12th October of 2004 3 transmitters are working in real-life operating conditions
- Two multiplexes are working in the Budapest area on 43 and 51 UHF channels with 1 kW ERP
- The first multiplex of Budapest is re-broadcasted at Kab-hegy on 64 UHF channel with 2.5 kW ERP
- Fix reception: 8k, 64QAM, 2/3, 1/32
- The multiplexes contain the programs of the three public broadcasters: mtv, m2 and DUNA TV
- We are now looking for public broadcasters from the west side of Europe to insert into our multiplexes

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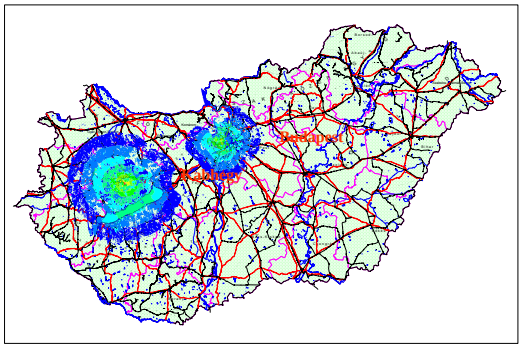
DVB-T coverage, fix reception



Coverage:
25% (population)
10% (geography)

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DVB-T project last year

Budapest

- Fully automatic redundant, completely new head-end for 10 TV and radio services
- Fully automatic redundant 2+1 transmitter system Liquid cooled, 1 kW transmitters with digital adaptive corrector
- New antenna and cabling system, D antenna-system
- Remote monitoring system for the transmitters
- Automatic monitoring system (TR 101 290, TS analyses)
- Equipment for MHP applications
- Conditional Access System trial (Cryptoworks)
- STB: 2400 basic, 300 MHP, 100 CAS

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Budapest site: 2+1 transmitter system; 2x 5+1 head-end system

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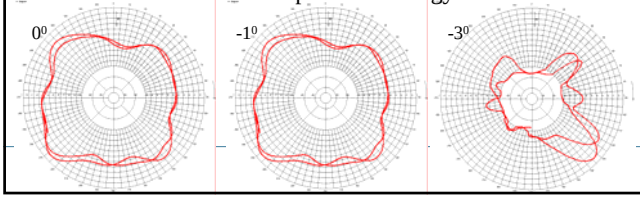
DVB-T project last year

Kabhegy

- 1+1 transmitter system
- New antenna installation on top the existing R&S antenna, OD antenna
- Remote monitoring system for the transmitters
- Automatic monitoring system (TR 101 290, TS analyses)
- Transport stream arrive from Budapest via nationwide SDH microwave network

DVB-T horizontal antenna pattern Kabhegy 2002



The complete DVB-T delivery chain

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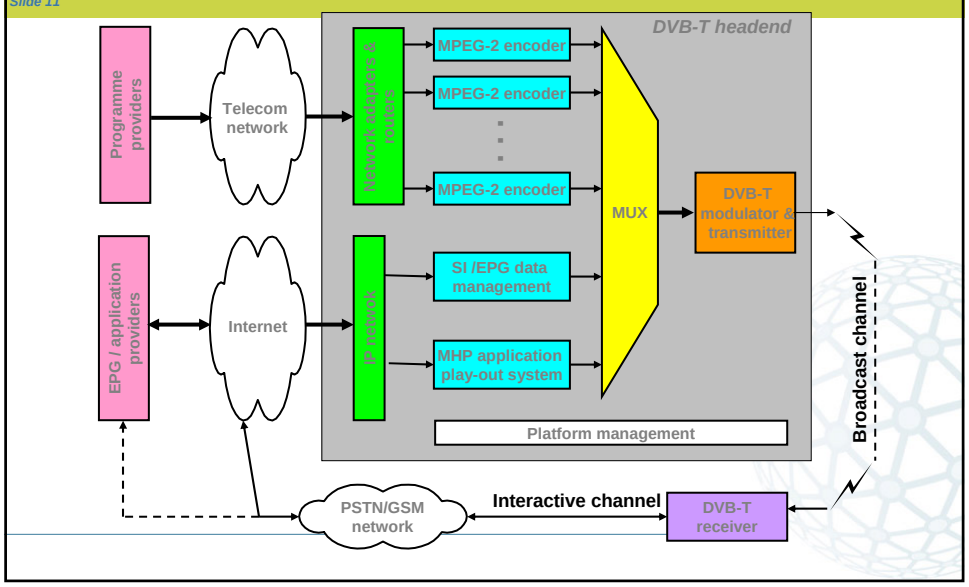

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The present

- 2x3 programs in Budapest, 1x3 programs at Kabhegy site
  24/7 operation
- 3 public TV programs, the other 7 not decided yet (belongs to National Radio and Television Body)
- 25% population coverage
- EPG service for 7days (based on MHP) under real-life operating condition
- Real-life Superteletext service
- Some MHP application trials:
  News Ticker, Voting, SMS/MMS wall
- Cryptoworks encryption trial

AH's MHP-based EPG application

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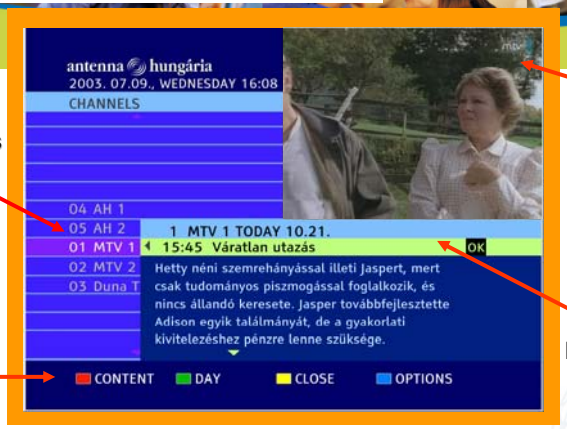

List of channels

TV picture

Program items

Menu

Unified user interface on different receivers

Design change without receiver software upgrade

Data transmission chain created for updating the EPG content

AH's MHP-based superteletext application – index page

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Leading news

TV picture

Logos, ads

Main menu

AH's MHP-based superteletext application – thematic page

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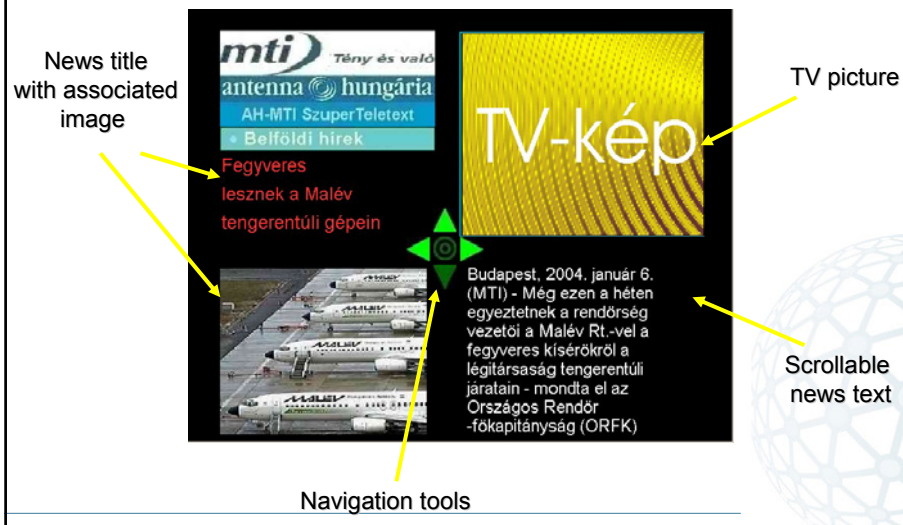

MHP-based News Ticker Application

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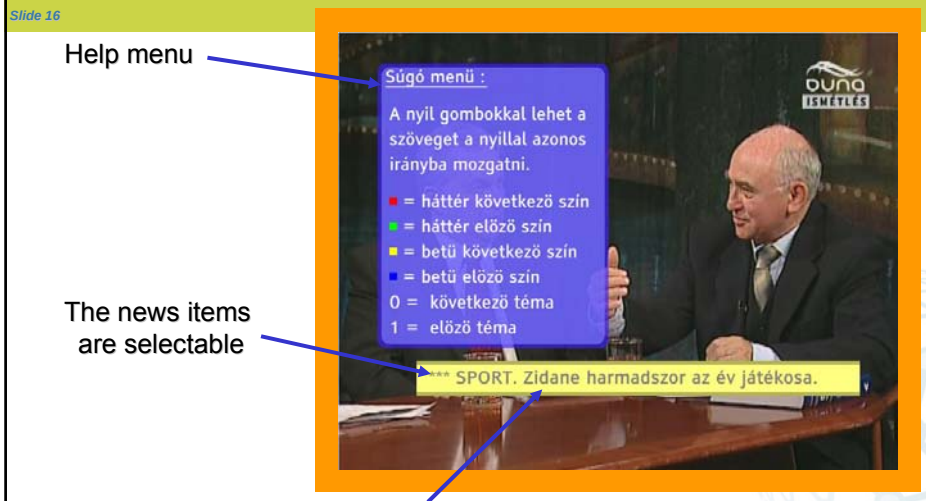

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AH's MHP-based SMS wall application

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AH has a good chance

- The „3 network plan" made to the existing sites of the AH
- AH has got the infrastructural bakground:
  - Sites, buildings
  - Energy systems, cooling systems, etc.
  - Antennas and towers
- Good professional background
  - Theoretical knowledge
  - Practical experiences

Thank you for your attention!

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