



standards and specifications

standards and specifications



KIEV - November 2000

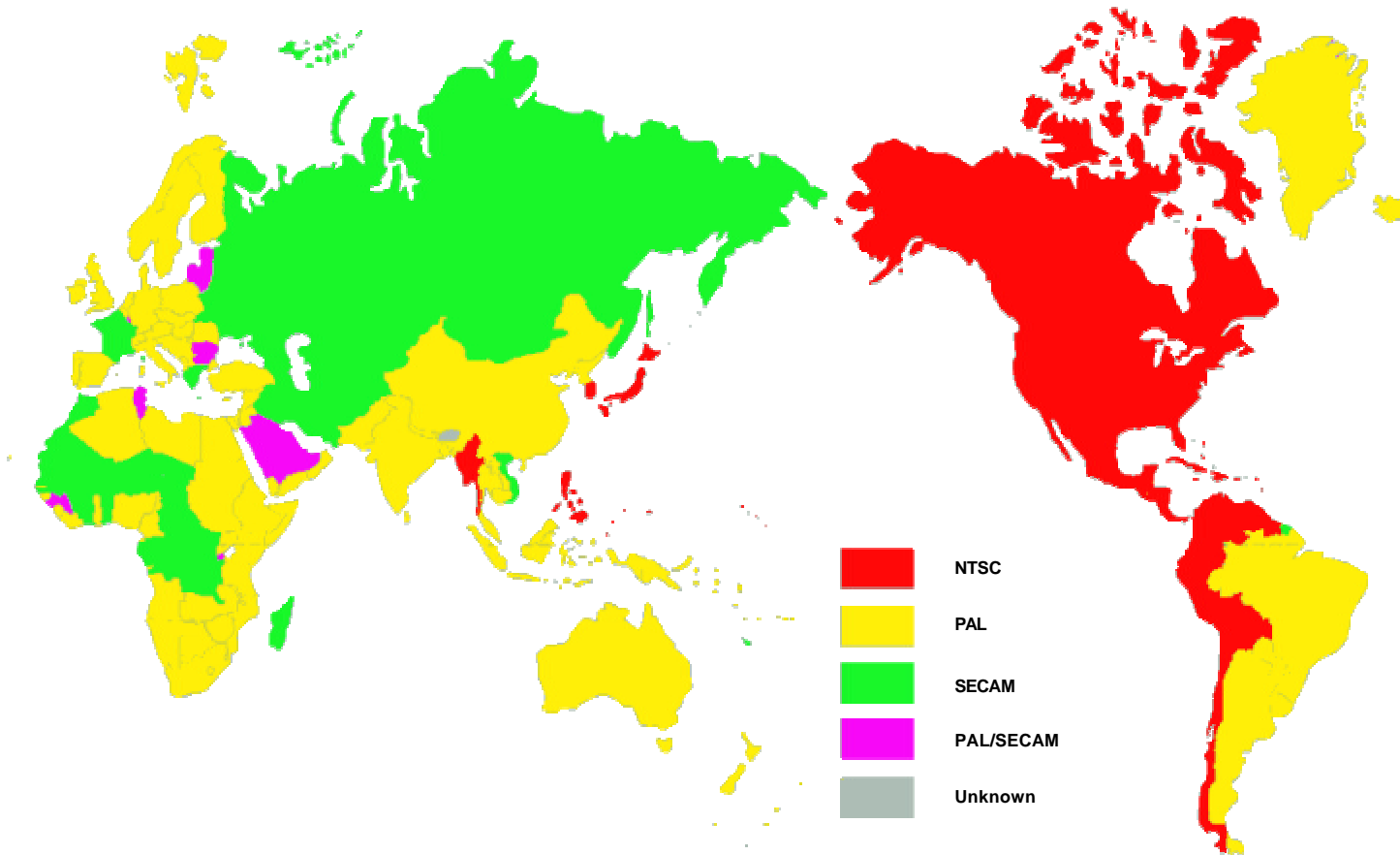


DVB
Digital Video
Broadcasting

DVB – Around the World

Anthony Robert Smith – DVB Project Office

Analogue . . . World TV Standards



Source: Neil Pickford (Australian Comms Lab)

DVB – Mission (1993 – 2000)

- Digital Terrestrial Broadcasting offers a series of benefits in comparison to analogue terrestrial television, not least being a more efficient use of frequency resources. This opens the way for new opportunities including more services, and with the appropriate transmitter network design, portable indoor reception and mobile reception.

- The DVB Consortium was set up in 1993 to give the broadcasting community an **INTERNATIONAL** set of standards aimed at all the broadcasting media – satellite, cable, microwave and terrestrial...

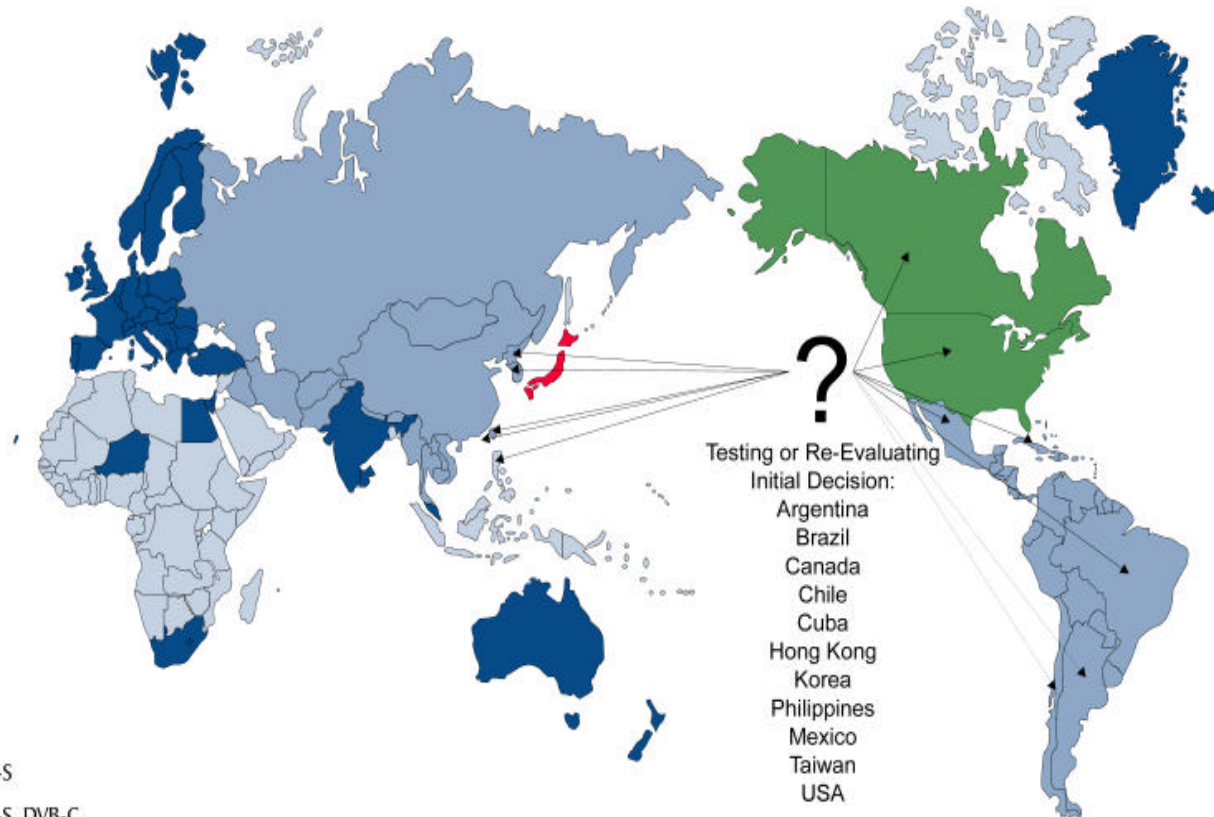


DVB
Digital Video
Broadcasting

**To this aim the DVB has been a MAJOR success!
Millions of viewers around the world are presently
enjoying the new digital technologies.**

Digital Standards - Worldwide 2000

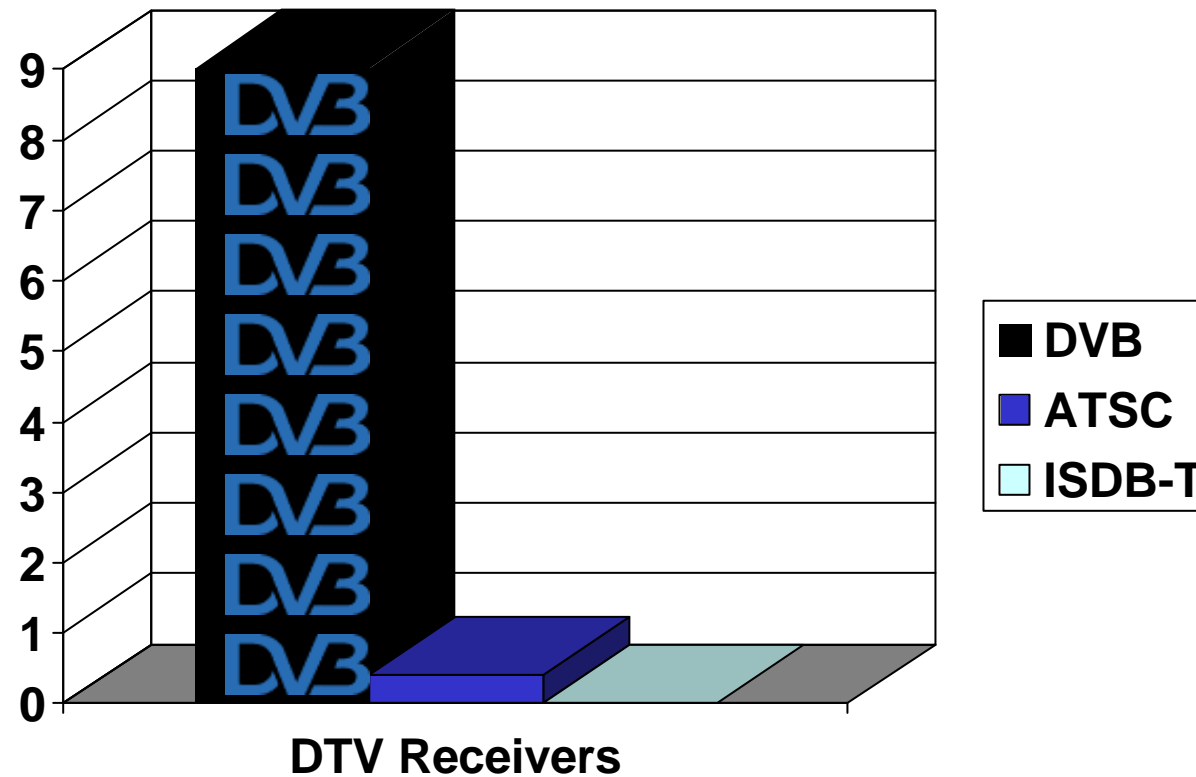
There
Are
Already
25,000,000
Households
In The
Digital
DVB World



- DVB-S
- DVB-S, DVB-C
- DVB-S, DVB-C and DVB-T
- DVB-C, DVB-S, ISDB-T - Japanese DIBEG Standard for Terrestrial Television - DELAYED UTIL 2003
- DVB-S, DVB-C, DSS - Hughes standardized digital satellite system, OpenCable - Digital cable standard by US Cablelabs, ATSC DTV

Receiver Implementations (100,000)

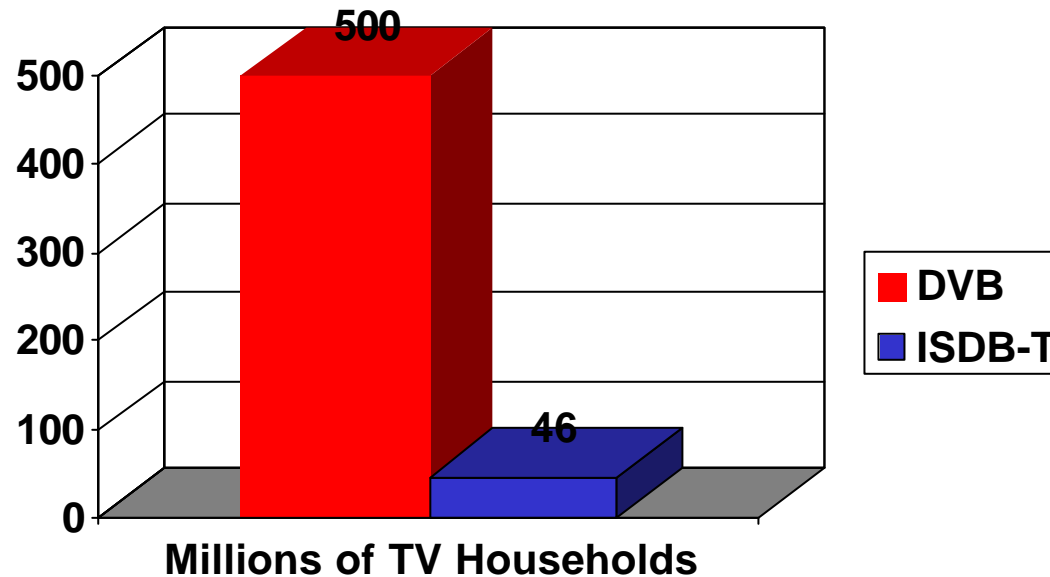
The only mature, widely implemented digital terrestrial television system at this moment is the DVB solution.



DVB-T TV Households confirmed

The Screen Digest report on Global Terrestrial Television states that the ISDB-T system is likely to have a market share of only 4%. In contrast DVB-T is currently available and enjoys global economies of scale.

Global Scale



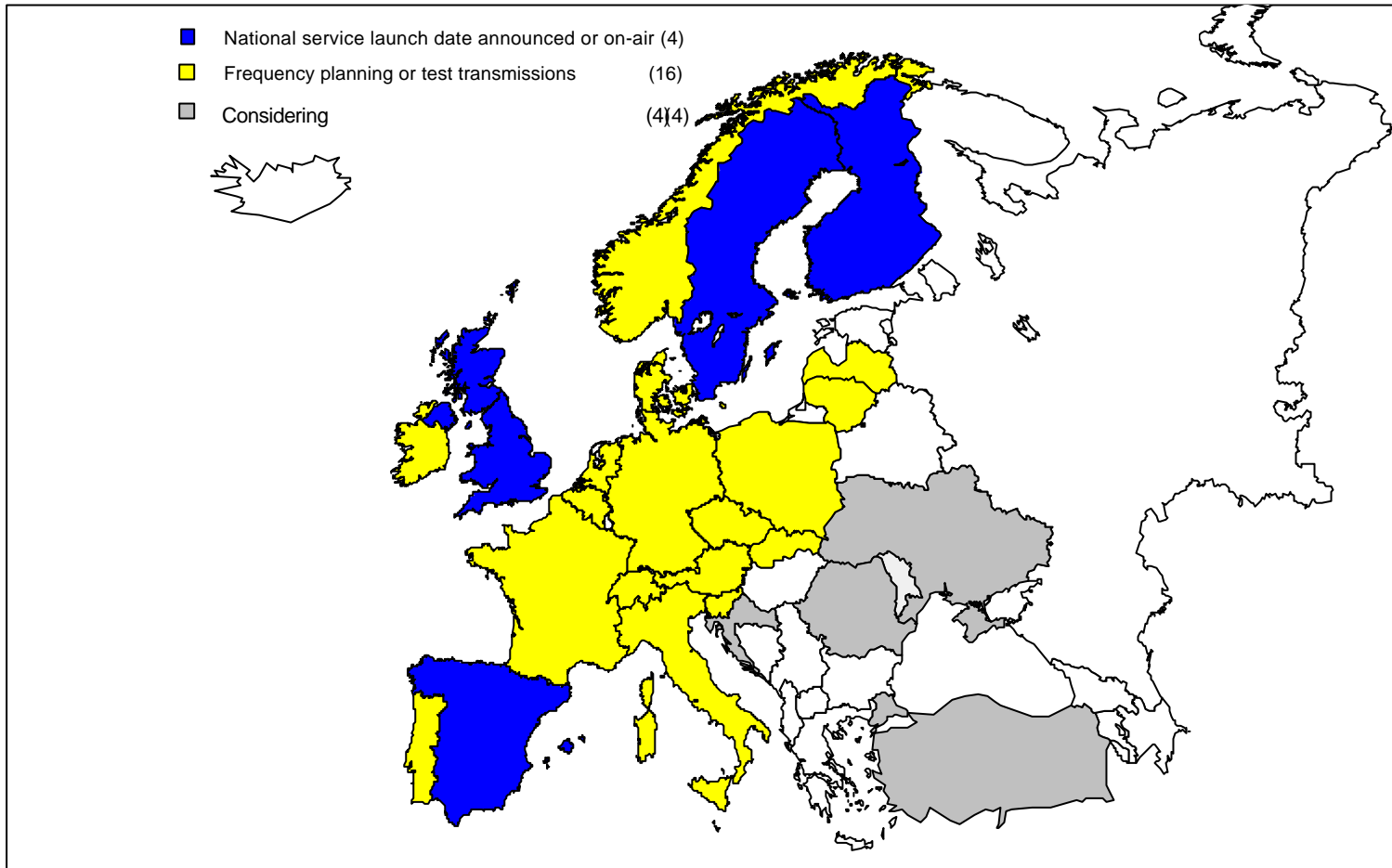
Informa Media Group - Forecasts predict Europe's top 7 countries will have 68 million digital TV homes by 2005!

Comparison between ATSC, ISDB & DVB

	ATSC	ISDB	DVB
Terrestrial	Yes	DVB-T (V1.05)	YES
Satellite	NO	DVB-DSNG (V1.05)	YES
Cable	Yes	DVB-C (V1.05)	YES
MMDS (< 10 GHz)	NO	NO	YES
MMDS (> 10 GHz)	NO	NO	YES
SMATV	NO	NO	YES
Service Information	Yes	DVB-SI (V1)	YES
Interactivity	NO	NO	YES
Conditional Access	Yes	NO	YES
Prof. Interfaces	DVB-SSI	NO	YES

A full portfolio of standards covering all transmission mediums for DVB-S, DVB-C, DVB-MMDS and now DVB-T ready to use and available off the shelf. DVB MHP and more to follow...

DVB-T - European Status





DVB-T - European Overview

Country	Co-ordination in progress	Number of transmitters (not number of stations)				Percentage of households that can already, or are expected in the near future to, receive the quoted number of multiplexes						Number of DVB-T	Date of last update
		Total at end of 1 year		In operation		1 M	2 MP	3 MP	4 MP	5 MPX	6 MPX or more		
(ITU Code)	(yes / no)	e.r.p. < 1kW	e.r.p. ≥ 1kW	e.r.p. < 1kW	e.r.p. ≥ 1kW								
AUT	No						X	X	X				06-10-00
BEL	Yes		2			X	12						22-03-00
CZE	Yes				5 ⁽¹⁾	>1							06-10-00
D	Yes	15 ⁽¹⁾	52 ⁽¹⁾	11 ⁽¹⁾	34 ⁽¹⁾	0							06-10-00
DNK	Yes			1 ⁽¹⁾	2 ⁽¹⁾	35						~ 50	06-10-00
E	Yes												
F	Yes			12 ⁽¹⁾	6 ⁽¹⁾								06-10-00
FIN	Yes	5	25	4	6	50	50	50				100	06-10-00
GB	Yes	220	266	220	266	81	80	78	79	76	74	800,000	06-10-00
HOL	Yes	3	25	0	2	18							06-10-00
HRV	No	1	1			20							28-09-99
I	No	15	15	3	5	15						1000	06-10-00
IRL	Yes												06-10-00
LTU	Yes												06-10-00
LVA	Yes												06-10-00
NOR	Yes		6		1 ⁽¹⁾	25	22						28-09-99
POL	Yes												06-10-00
POR	Yes			1 ⁽¹⁾	2 ⁽¹⁾								28-09-99
S	Yes	~20	~200	12	64	70	70	70	70			~35,000	06-10-00
SUI	No			1 ⁽¹⁾	1 ⁽¹⁾								28-09-99
SVK	Yes		3			10							06-10-00
SVN													22-03-00
TUR	No												28-09-99

standards and specifications

Italy - on Air

- 4 x DVB-T transmitters in operation in Band V and Band III.
- The development of EPG, Super-Teletext and Interactive Advertising Applications is ongoing.
- All based on the DVB-MHP open API platform.



MEDIASET has completed the planned MFN and SFN field tests – Will start to convert a number of analogue transmitters in 2001.

France Start Mobile Tests in Paris



' the excellent results of mobility tests let them foresee to offer digital services which will be received in vehicles (cars, buses, trains) and on all "pocket computers" (PDAs) and mobile phones'.

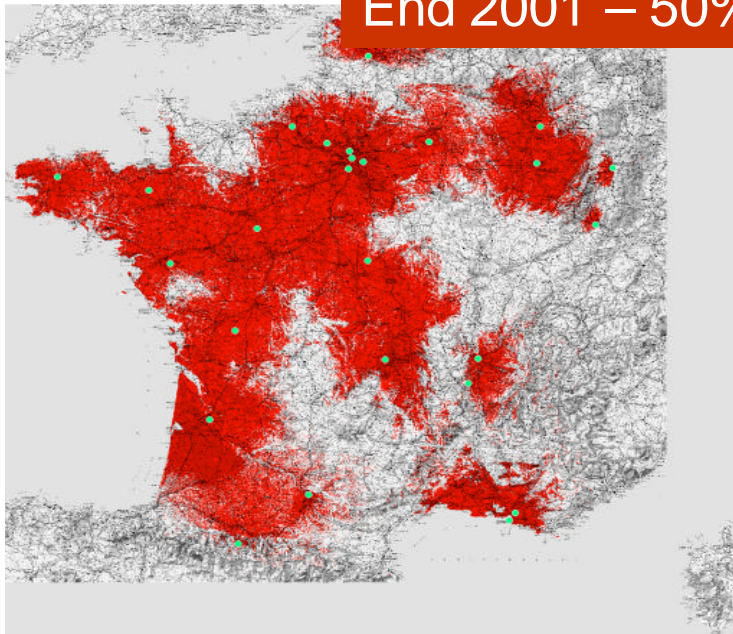


- TPS, the digital TV "bouquet", of which TF1 is the operator, announces being "a new natural candidate to the future digital terrestrial network". The group states in a press release that it "thinks of exploiting and broadcasting channels and interactive services from its current offer on the future digital terrestrial network".
- The group indicates that it is currently running "a digital broadcasting test in the Paris area".

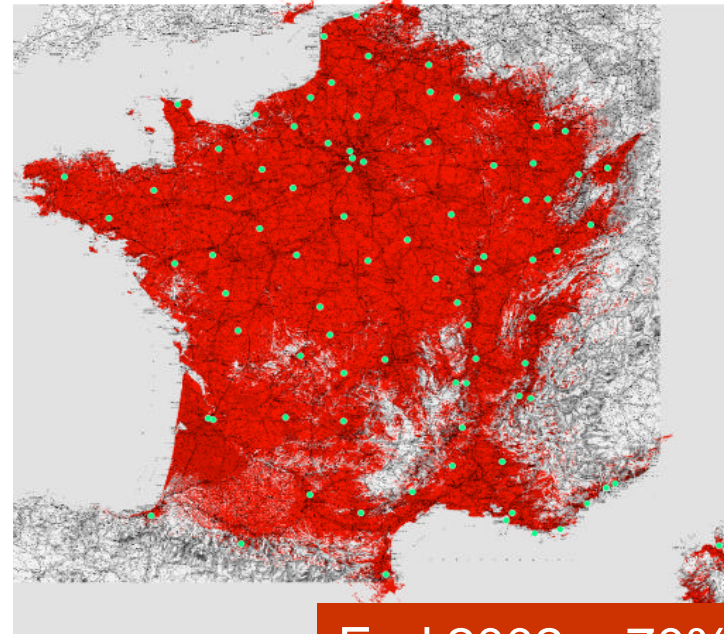
France Plan for a 70% coverage in 2002

France – Looking to concentrate on coverage to portable and indoor reception...

End 2001 – 50%



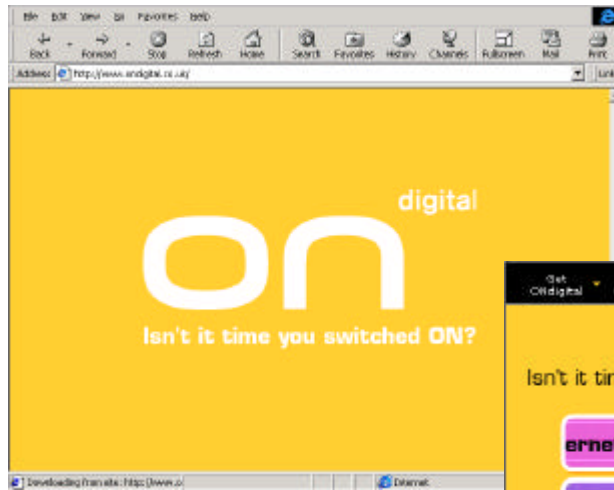
End 2002 – 70%



Canal + are starting new experiments in Band III

ONdigital - Implications of being the First

- 'Guinea pigs' for the rest of the world
- Other countries studying different models
- Better implementations to follow
- Can do full Internet/Interactive/Enhanced immediately



- 6 Multiplexes**
- 9 free channels
 - (5 Analogue)
 - 30 subscription
 - 7 text/games
 - 5 ppv

VOD services next

Implementation of Internet

ONdigital announce 1500 new jobs!

DVB Offers Instant Business -

On the 5th May 2000 the Spanish DTT operator 'Quiero TV' launched its 14-channel digital TV service, at the same time unveiling integrated 56kbit/s internet access from day one!



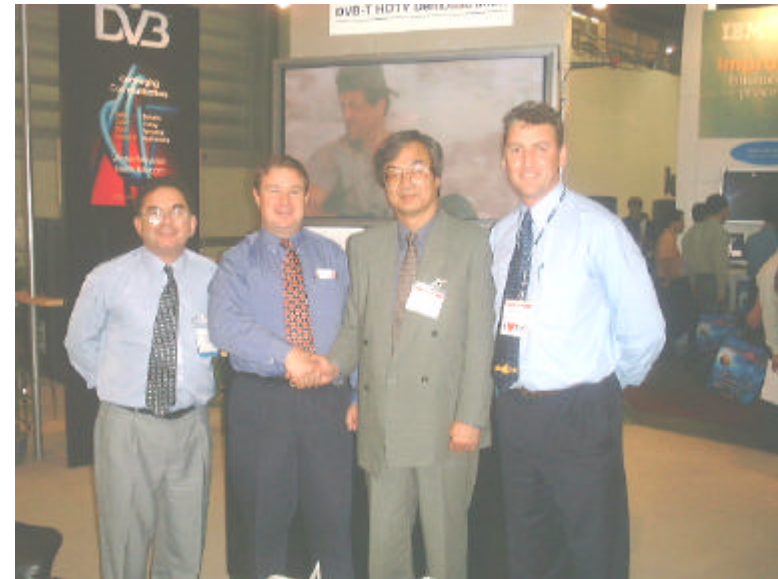
HDTV and DVB



Demonstrated to ARIB
at BCA2000
DVB-T - HDTV @24Mb/s

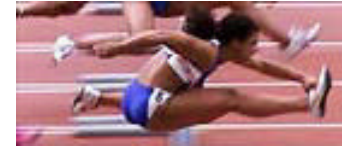


DVB-HDTV in 6MHz -
Hierarchical DVB-T



(Also demonstrated in 6 MHz at 19.77Mb/s in Washington as pure DVB-T HDTV)

HDTV and Australia



- Currently there are 3 test VHF DVB-T 7MHz transmissions on air in Sydney with erps of 20 KW interleaved with the regular PAL 100KW transmissions.

- During the Olympics, the Seven Network simulcast its Olympic program on its digital service so that about 40 coach/buses carrying sponsors and guests to and from venues didn't miss out on any of the action. This was thanks to Nokia set-top-boxes (not media screens), feeding regular TVs mounted in the buses. Mobile TV with perfect reception!



- There are working chips for HD and AC-3 and in fact an array of iDTVs and set-top-boxes some with HD and AC-3 have been shown at a public demonstration in Sydney.

There WILL be a range of low-cost SD receivers up to full HD receivers in the marketplace.

DVB Systems Grow – DVB HDTV in the USA



Dish Network currently offers two 1080i high-definition channels, HDTV HBO and HDTV Showtime.



<http://www.dishnetwork.com> ...marc.lumpkin@echostar.com



- 720p and 1080i for both wideband component (YPbPr) and 15-pin RGB.
- 720p mode, all standard definition and high-definition material output as 720p.
- 1080i mode, all standard definition and high-definition material output as 1080i.
- Native output of 480i and 480p through wideband component and 15-pin RGB will not be supported.
- All content will be down-converted for display at 480i through s-video and composite for older televisions.

TV on a Tram @ Mobile Public Services



Amsterdam 1999

One of Amsterdams leading 'Advertising Agencies' will play a major part in the 'TV on the Tram' future of Amsterdam...



Cologne 1997



IBC 1998



NAB 1998



Singapore completes trials and 'call for tender' for mobile TV on the trams & buses 2000.

TV on a Tram @ Mobile Public Services



Main transmission site

- Singapore TV Mobile service involves 2000 buses.
- 10 transmitters in an SFN covering the island.



On-channel repeater



5cm high antenna on buses

World's First Mobile TV Service



Singapore bus with antenna



Robust LCD monitor

- At night, when the service is not running, there is plenty of opportunities for datacasting.
- TV Mobile is a reality!
- And it uses DVB-T!



Screens throughout buses

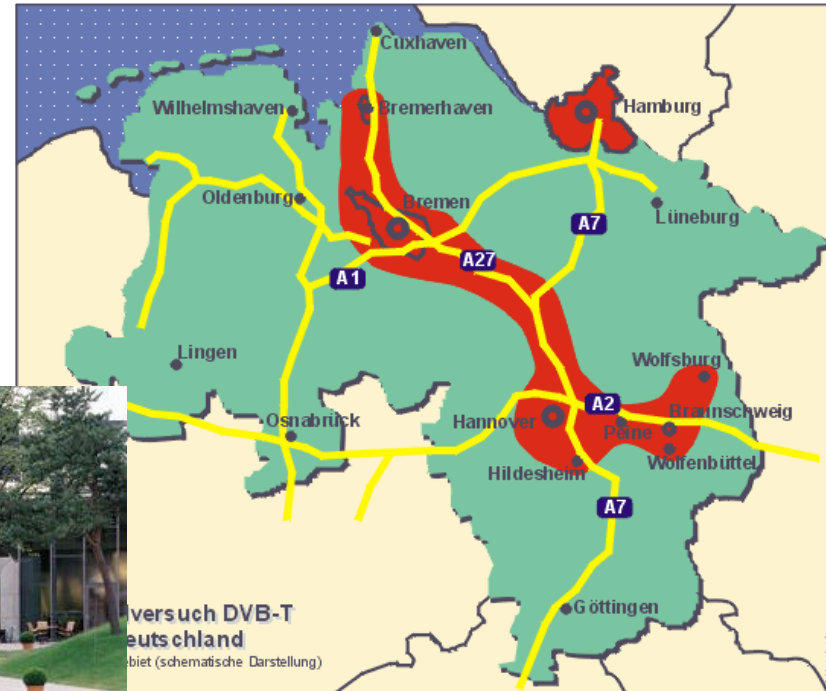
Volkswagen Launch Fleet of DVB-T Cars

The future of 'mobile media' is here:

- Stock Market On-Line
- Traffic Information
- Television News
- Films
- And more...



World on Wheels



Germany is looking to portable indoor reception and mobile services to the whole country.

DVB System Tests – DVB-T Mobile in the USA



- A mobile DTV trial using DVB-T/COFDM is currently being assembled in Santa Clara, California with GBC station KNTV using NBC/CNBC content.
- Those involved in the Singapore trials will assist in this project.

- A mobile DTV Demo takes place in the Finnish homeland of NOKIA, this **November 24th & 25th** in Helsinki.

- During the IST Conference the TRAM route Messukeskus – Mäkelänkatu – Häameentie – Kaisaniemenkatu – Mannerheimintie – Messukeskus will be fitted out to watch Mobile DTV.

- **Finland will cover 70% of the population by 2001 and the whole country by 2005/6.**



Digital Equipment Expansion

We are moving ahead rapidly...



new
T18



65cm (25")



SC 5303



NetGem
WWW.NETGEM.COM

Digital Equipment Expansion

Yes we are moving ahead rapidly...Nokia Media Screen to the...

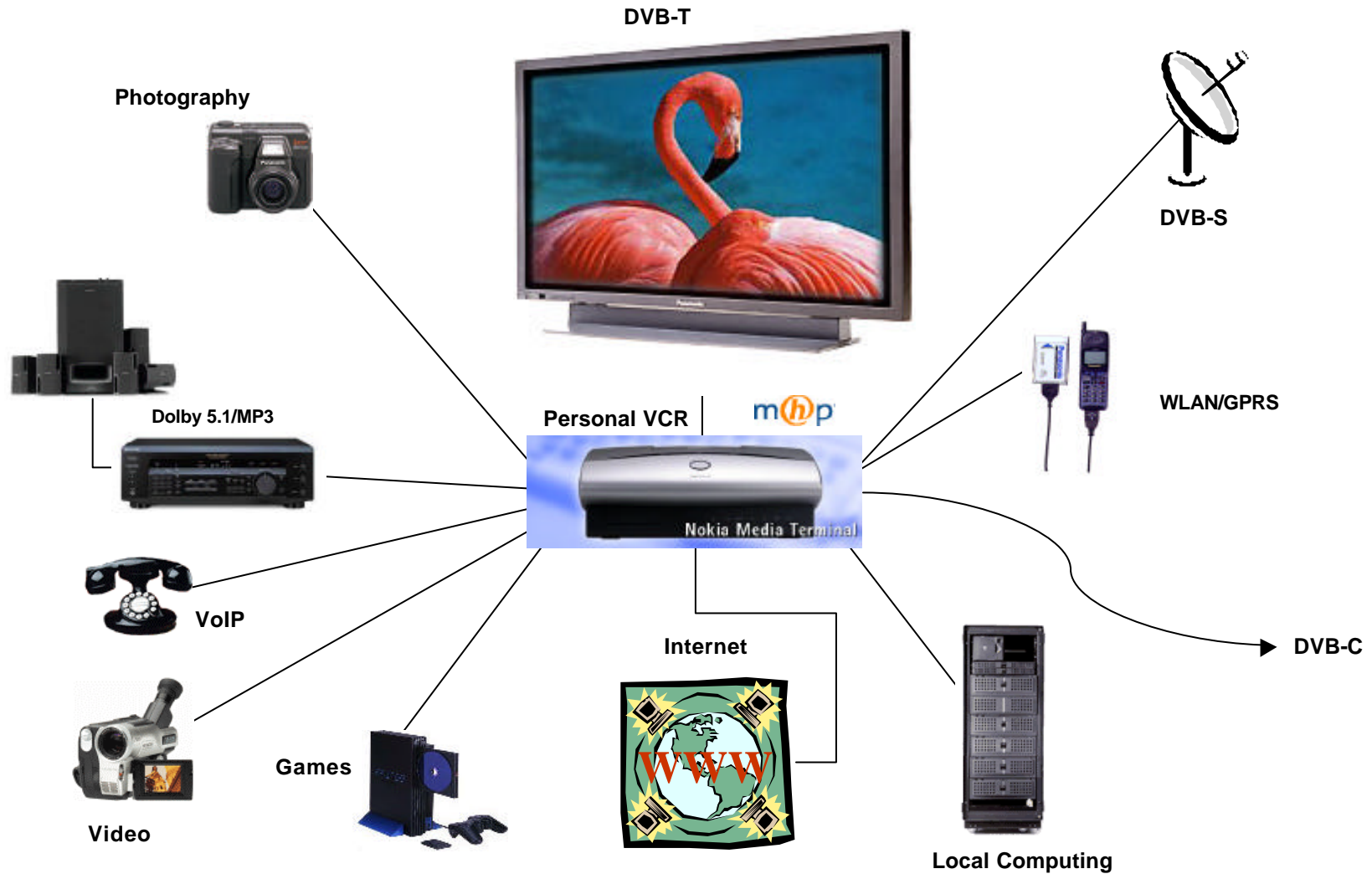


Interfaces –

- 2x DVB Front End tuners
- ISDN, ADSL, Ethernet, Cable Modem
- S-Video, RGB, SCART, 2xRCA, s/PDIFCoax Digital
- 2xSmart Card
- 1xPCMCIA – WLAN, GPRS
- 2xUSB
- 2xIEEE 1394
- 1x RJ11
- 1xRJ45
- 1xIR (RC-MM)
- 1xCommon Interface

366Mhz Celeron CPU, 20GB Hard Drive,
MPEG2/DVB Compatible Engine, V90
POTS Modem...32-64MBytes RAM, 4MB
SDRAM Video, 1+1 MB of Flash
memory...Accelerated 3D Graphics,
Macrovision 7 Compliant, PAL & NTSC....

In Home - Convergence is Here and DVB is a part of it!



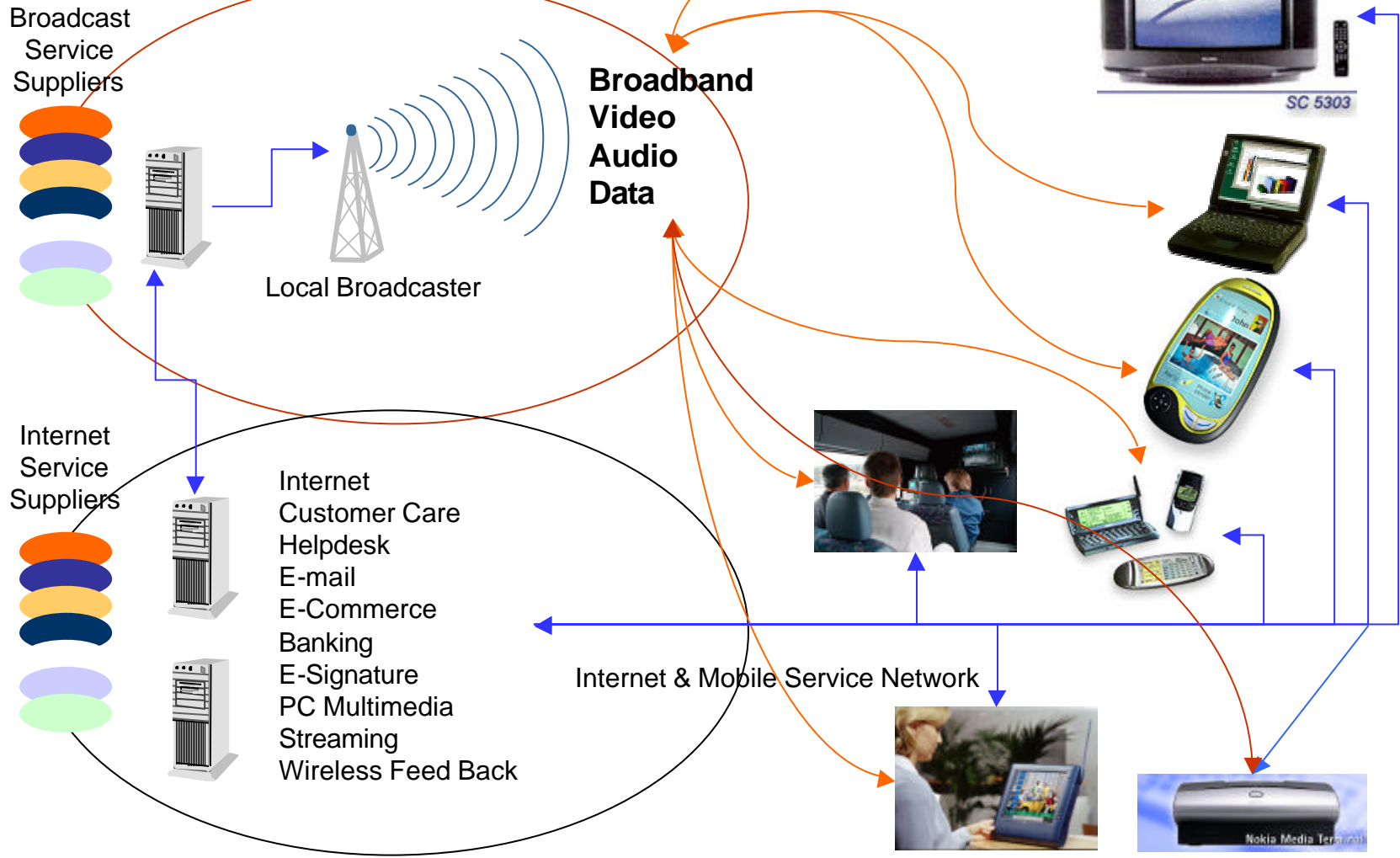
The DVB-T Digital TV Revolution

Ti-dTV
Terrestrial Integrated Digital TV



DVB-T

Future Business - Means much more



standards and specifications

Looking Ahead – Developments in DVB-T

DVB-T/DVB-S Multimedia Kiosk

Now available in the market...It is a product out of the 'RAI' - Italy.

[DVB-T Multimedia Kiosk](#)



This kiosk made its debut at IBC 2000.

DVB and 3GM - UMTS



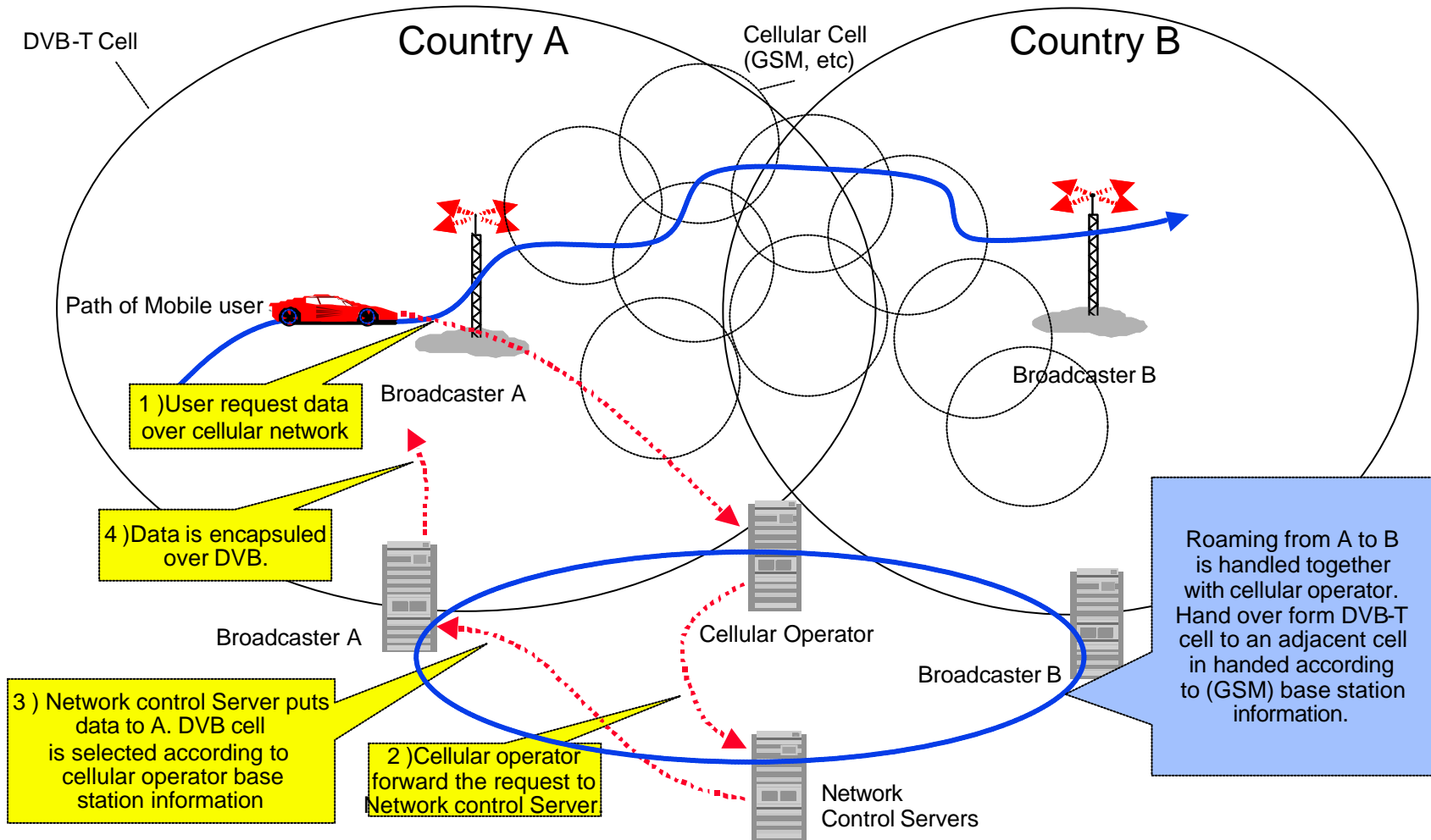
- DVB is collaborating with the 3G-PP (Partnership Project) in order to complete various forms of convergence between DVB and the 3G Mobile systems.

The following ties in the two technologies

- **DVB is the point-to-multipoint broadcasting extension of UMTS for content which is not required by just one individual.**
- **UMTS will be one of the return channels.**
- **UMTS uses an MHP light version together with DVB.**

3GPP Wins 'World Congress 2000' Prize for globalization of UMTS!

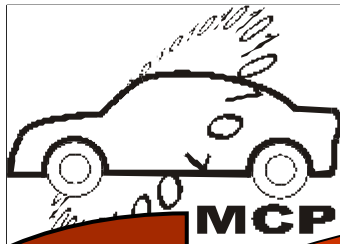
Mobile DVB-T terminal system topology



DVB and Mobile - Convergence

Mobile radio (GSM, GPRS, UMTS)

- point-to-point
- interactivity
- billing of time and load



Broadcast (DVB-T, DAB)

- point-to-multipoint
- mostly free-to-air
- 1 ... 15 Mb/s (mobile)
- high-quality video



3GPP Wins World Congress 2000 Prize for globalization of UMTS

Interactive Return Channels (In Band) and MHP

DVB-Java
DVB-HTML

The DVB-MHP Specification that will take the DVB-S, DVB-C and DVB-T boxes down a route to enhanced, interactive and Internet broadcasting has been approved by ETSI (TS 101 812 (MHP)).

DVB has recently developed 'return channels' (DVB-RCCL, DVB-RCS and DVB-RCT).



Philips Tri-Media MHP Demo - BCA2000



DVB-MHP Launch Event at IBC 2000



DVB MHP Event



Over 600 people attended the DVB-MHP launch party... testimonials were heard from Sun microsystems, Philips, Betaresearch and we saw an 'authoring tool' demo from 4DL.



DVB Stand Demos



DVB-MHP Launch Event at IBC 2000

Massive
International
Interest
in

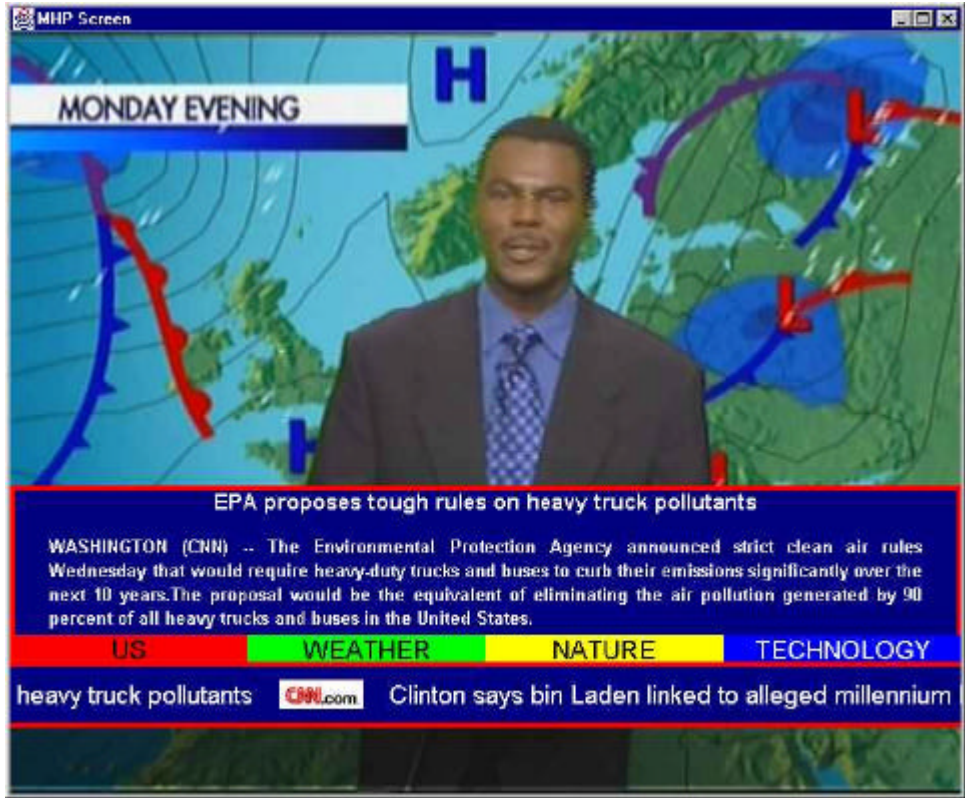


‘Anyone implementing advanced TV will have to deal with DVB-MHP’

DVB-MHP Launch Event at IBC 2000



MHP Demos at IBC



MHP Screenshot of CNN

'MHP is the 'glue' that brings seamless services to all DVB systems – DVB-S, DVB-C and DVB-T'.

Conclusions

- DVB was not intended to copy or emulate the alternatives in the market but provide solutions to all Digital Broadcasting needs.
- DVB has achieved this in Satellite, Cable, Terrestrial, MMDS, Data Broadcasting, and much, much more...
- DVB is the world leader in DTV/DTH with over 25 million decoders distributed around the globe!
- Countries can take the maturity of DVB-T and have instant DTV!
- DVB is now focusing on the future to bring solutions for tomorrow's technologies.
- Great prospects for the future of the television industry in a convergent world!
- Backed by 300 of the world's leading technology companies.

Points to Note:

JAPAN Will Not Launch until 2003 – Very little Silicon Available

ATSC has problems at home - NAB Chairman declares the the ATSC 8-VSB is, 'Close to Market Failure'.

DVB – The Next 5 Years

DVB Mission Statement:

To build a content environment that combines the stability and interoperability of the broadcasting world with the vigour, innovation and multiplicity of services of the world of Internet.

Overall theme for the future

DVB is tasked to provide a set of tools and techniques that will enable:

- the delivery of content through networks to consumer devices in a transparent and interoperable fashion
- the commercial exploitation of the movement and consumption of content in a secure manner
- a robust framework of new, interactive services



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DVB – For the New Millenium