



DAB Surround



DAB Surround & Journaline – Enhancing the Digital Experience

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Enhancing the Digital Experience – DAB Surround



DAB Surround – Overview



- **5.1 Surround Sound for Digital Radio**
- **Revolutionary Radio Listening Experience**
e.g. radio play, classical music, rock concert, broadcaster jingles, advertisement, sports
- Listeners know benefits from cinema/DVD:
Radio Evolution **Mono** → **Stereo** → **5.1 Surround**
- based on MPEG Surround (like DAB Surround):
 - **fully mono-/stereo receiver compliant**
 - very small bitrate for surround signal (e.g. 4-10 kbps) – no simulcast required
 - Artistic Downmix for optimized stereo signal

MPEG Surround – Benefits of 5.1 Surround Sound



Stereo

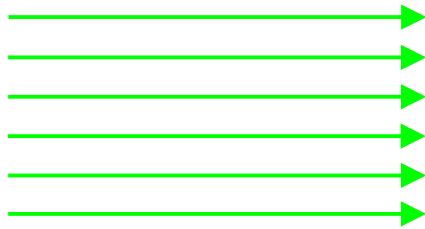


5.1 Surround



- Enlarged sweet spot
- Stable center channel
- Increased listener envelopment

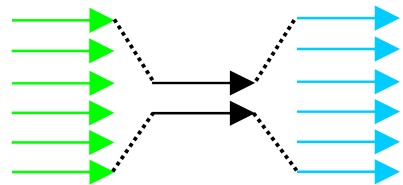
MPEG Surround – Technology Revolution



Discrete multichannel coding
(AAC multichannel,
Dolby Digital, DTS, ...)

Discrete Multichannel Coding

- + Very good/perfect quality
- Requires high bandwidth / storage capacity
- Not backward compatible (to stereo/mono)

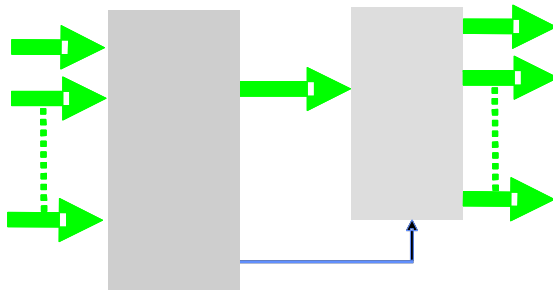


Matrix based multichannel
(Dolby ProLogic II, SRS, ...)

Matrix based Multichannel Coding

- + Uses existing stereo infrastructure
- + Backward compatible
- Affects stereo signal for legacy receivers/decoders
- Partly poor multichannel quality (e.g. channel separation)

MPEG Surround – Technology Revolution

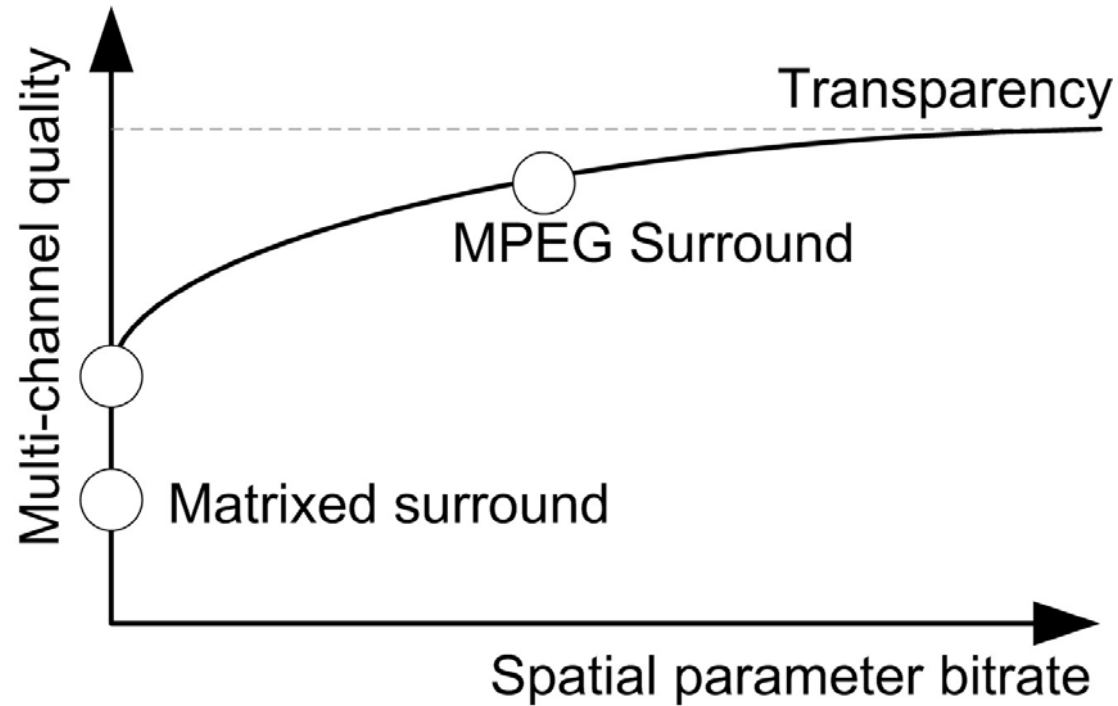


MPEG Surround

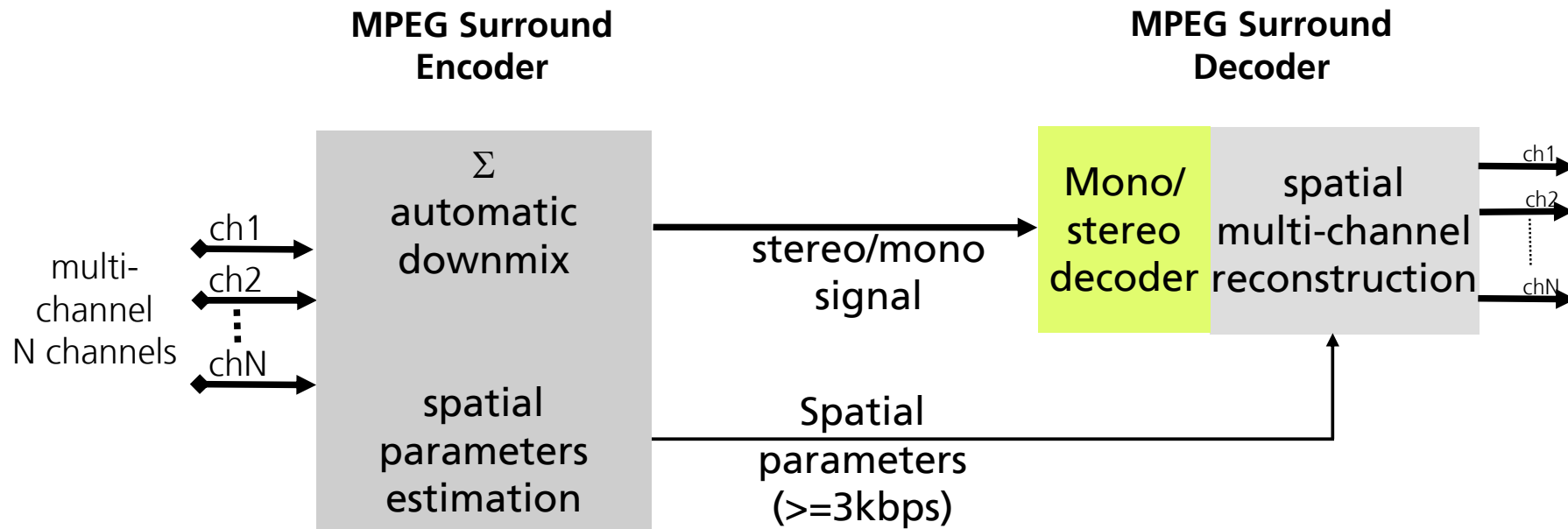
- + Fully backward compatible (stereo/mono decoders)
- + Perfect stereo- and mono quality (legacy decoders)
- + Very high multichannel quality (channel separation)
- + Very low bandwidth / storage capacity
(side information of e.g. 4-10 kbps transparently carried in the audio stream)



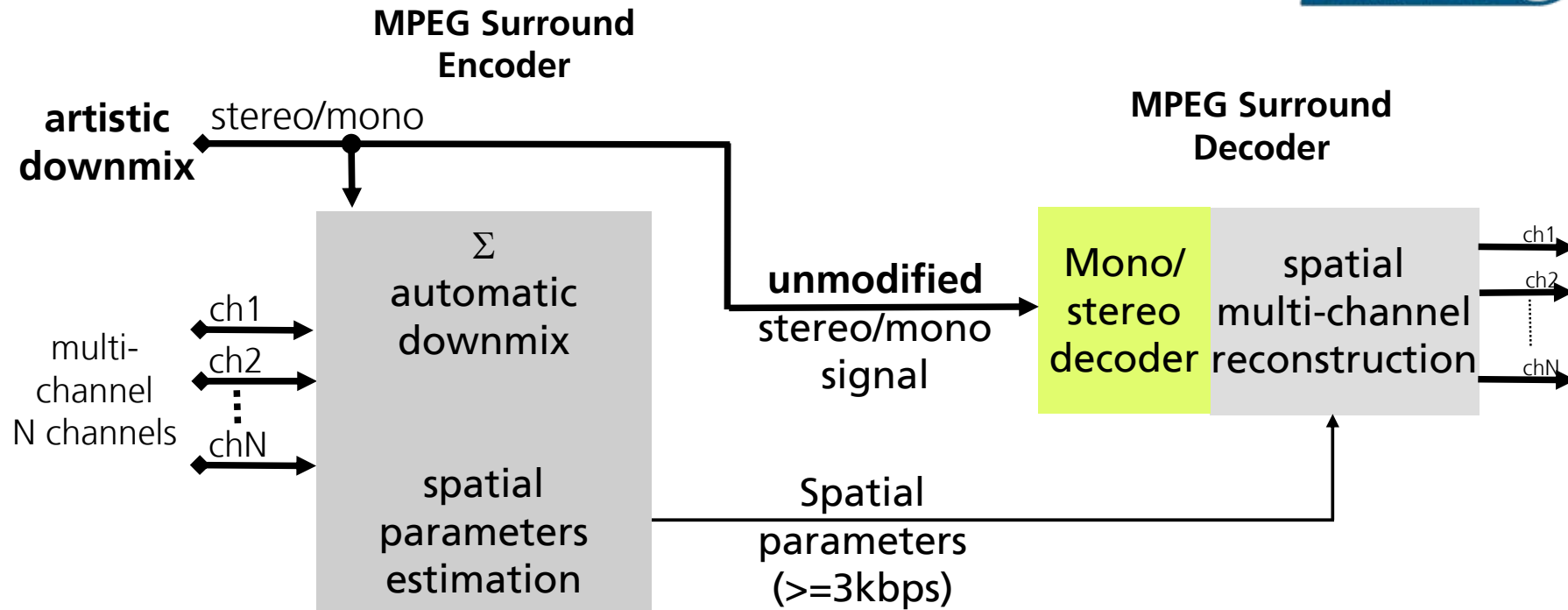
MPEG Surround – Quality



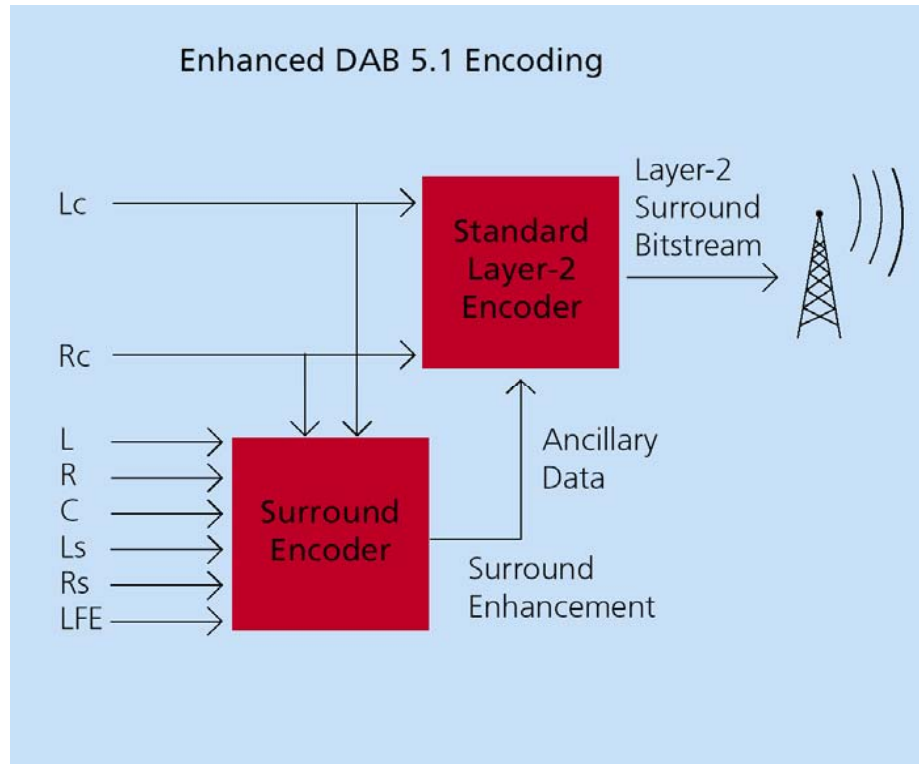
MPEG Surround – Technology



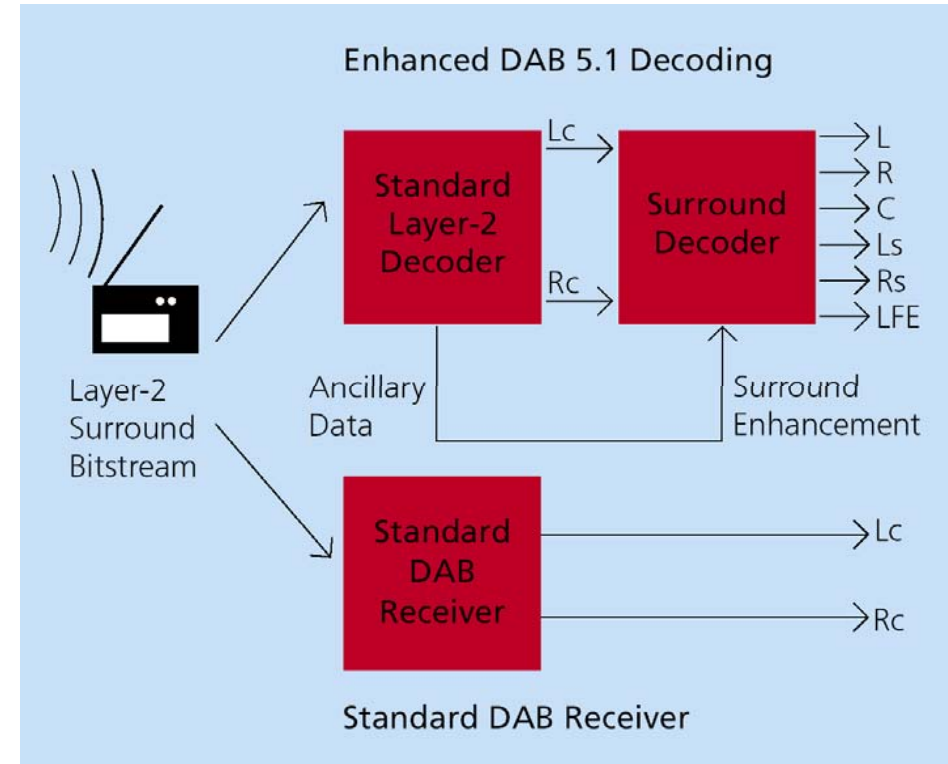
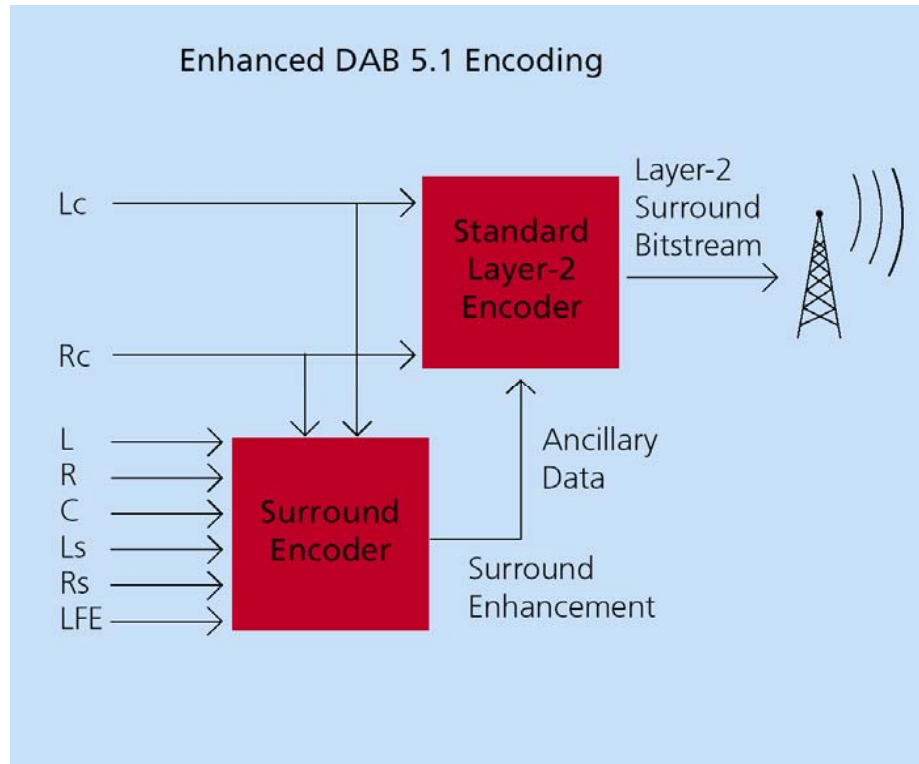
MPEG Surround – Technology



DAB Surround – MPEG Surround for Eureka 147 DAB / DAB+ / DMB

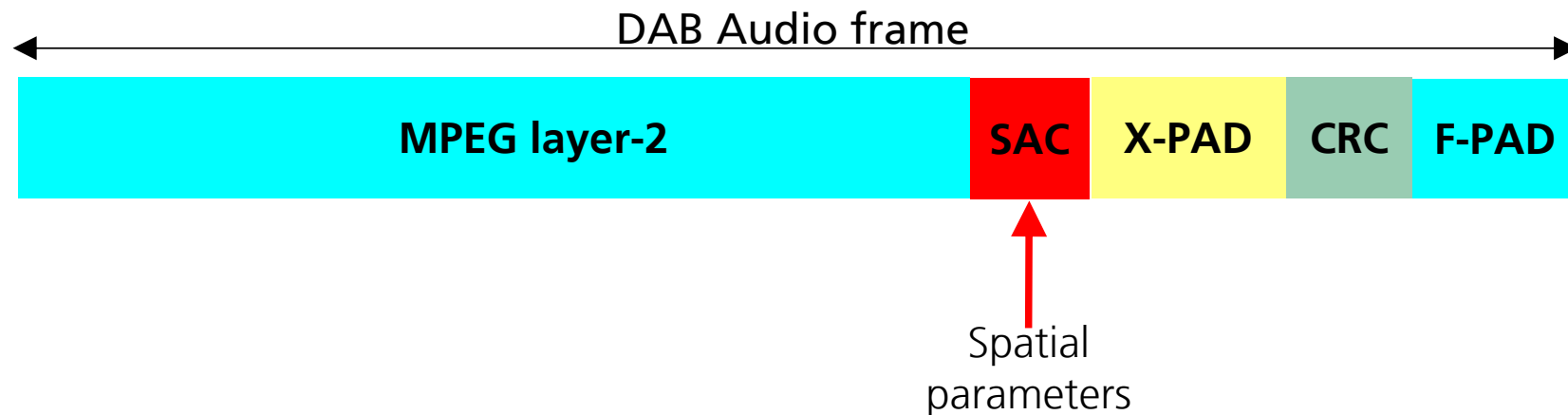


DAB Surround – MPEG Surround for Eureka 147 DAB / DAB+ / DMB



DAB Surround – MPEG Surround for Eureka 147 DAB / DAB+ / DMB

Spatial parameters transport within MPEG Audio Layer II (DAB classic)



MPEG Surround in other Broadcast Standards



Available for:

- **DAB classic** (MPEG standard)
- **DAB+**
- **DMB** (MPEG standard)
- **DRM** (both DRM30 / DRM+)

Finalized in the near future (in progress):

- **DVB** (all flavours: -H, -T, -S, -C)

DAB Surround – Broadcast Chain



Studio View

- Requires multi channel infrastructure upgrade
- For a longer time mix of 5.1 and stereo content
→ **SX Pro** for stereo enhancement towards surround



Receiver View

- In-car and home cinema
perfect 5.1 listening environments
- **Binaural Rendering** enables 5.1 surround sound
playback with regular stereo headphones

DAB Surround – On Air today!



- **Rock Antenne** (commercial German broadcaster)
regular 24/7 DAB Surround transmission since Oct 2007
- **Bayerischer Rundfunk BR-4 classic**
(public german broadcaster)
frequent DAB Surround transmissions since 4 years,
now preparing to switch to regular 5.1 DAB Surround
(operational by end of 2009)
- other German public broadcasters
currently in planning stage for DAB Surround



NewsService *Journaline*®

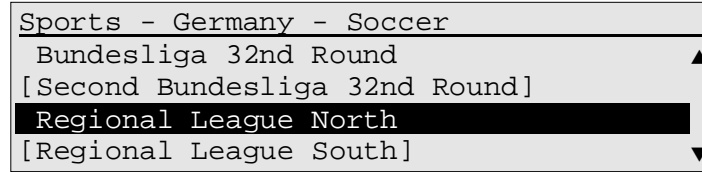
Feature Overview



- Hierarchically categorized text information
→ **“Teletext for Digital Radio”**
- Push & store service for any digital radio platform
→ Immediately available for **interactive use**
- Provides:
 - **flexible menu structure**
 - **detailed text information** (headline, body text)
 - **list type messages** (automatically updating: sports results, stock market, etc.)
 - **ticker messages** (categorized information)
 - **bookmarking** (favourites feature)

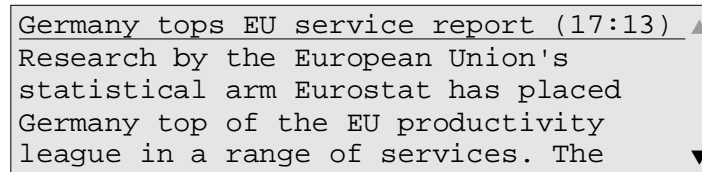
Journaline® – Page Types

■ Menus



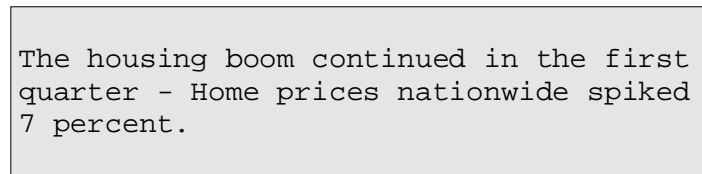
Indication for not-yet-cached links;
Automatic updates

■ Plain Text Messages



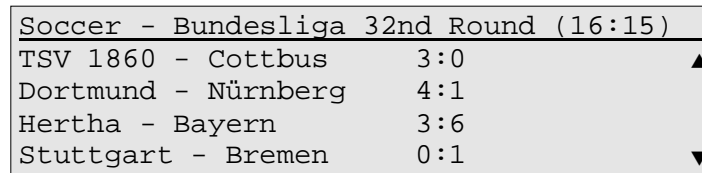
Optional update signalling to user

■ Title-Only Messages (newsticker)



Automatic updates, no user interaction –
,TextMessages by topic'

■ List Messages

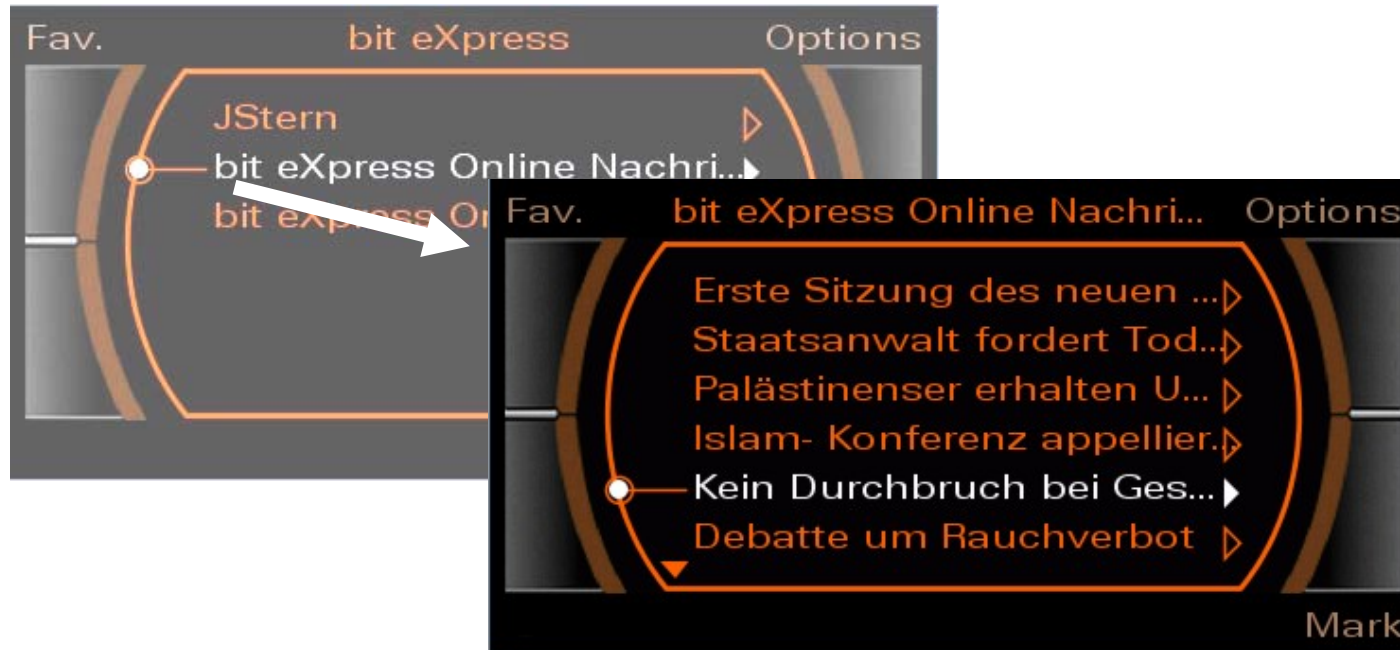


Automatic updates while keeping scroll position –
,Sports results view'

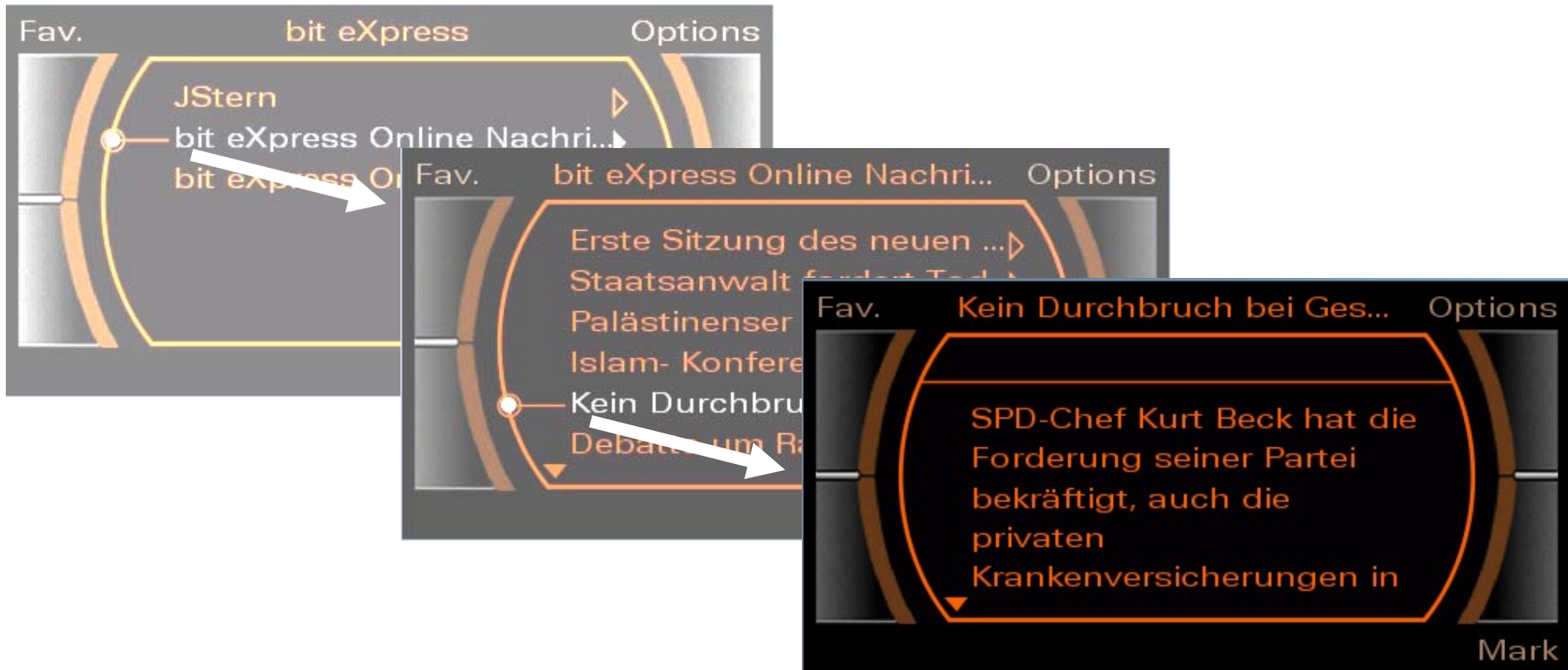


Source: Fraunhofer IIS (Audi MMI)

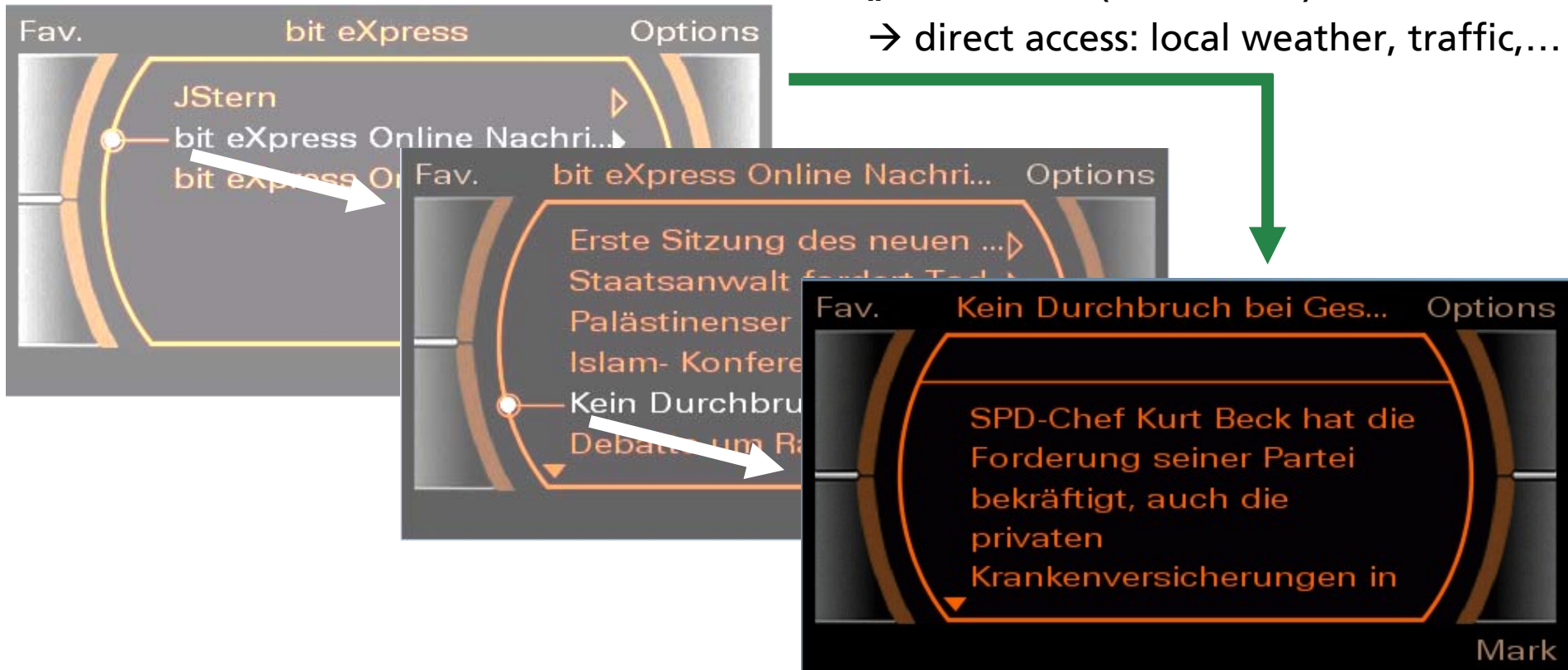




Source: Fraunhofer IIS (Audi MMI)



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Source: Fraunhofer IIS (Audi MMI)

Feature Overview

*Optimized for
Efficiency & Simplicity
all along the
broadcast chain.*



- Specifically designed for digital broadcast services:
low bitrate requirement
- Re-use of **existing data sources** for broadcasters (RSS, XML),
Internationally applicable (Unicode/UTF-8)
- Optimized for **inexpensive consumer receivers** (low decoder and user interface requirements)
- Extensible **hinting information** for advanced receivers:
back channel, speech hinting, geo-tagging, etc.

Journaline[®] – Extended Functionality (1)

Can be inserted into any Information Object.
Processing is optional for decoders.



- **Basic text formatting:**
new line, preferred word break,
highlighted section, keyword marking,
introductory/detailed section delimiter, etc.
- **“Hot Button” and interactivity support:**
links to other Journaline objects,
web pages, DAB/DMB/Drm services,
telephone numbers, SMS, e-mail, etc.

Journaline[®] – Extended Functionality (2)



- **Geo-Tagging:**
links Information Pages to location(s)/ regions
(Show on map; Navigate-me-there; What's around)
 - **Speech support:**
default/section language, IPA speech phoneme
description for difficult or unusual words/names,
speech breaks, text handling rules, etc.
- Any Extended Information can be inserted without
affecting existing receivers
- Easily extensible in future as needed

Journaline[®] – Service Scope

Station List

- My Radio *J!*
 - Hot Station
 - WRXZFLK North
 - Radio Antarctic *J!*
 - Radio FhG *J!*
 - Chat Radio *J!*
-
- AAA Member Service
 - ADAC Journaline

Services based on Journaline could be setup as

- **Radio program accompanying:**
provided by Broadcaster;
re-use of existing information / Internet content;
listener service and advertisement
 - **Stand-alone services:**
enables commercial / group services (auto clubs),
or closed user groups
(‘available to all ModelX car drivers’)
- **Journaline is the platform to enable efficient text information services on the Radio**

Journaline® – Type of Content

General information:

- News
- Sports events and results
(incl. result tables with real-time updates)
- Financial information / Stock market values
- Airport departure / arrival times
- Advertisement (with interactivity / Hot Button)
- Games / Lottery
- ...



Journaline® – Type of Content



Program related information:

- Station contact information for listener feedback
- Show background information (e.g. optionally with link to online-platform)
- Direct phone link to participate in chat show
- Captions (Mobile-TV subtitles / Radio for the impaired)
- ...

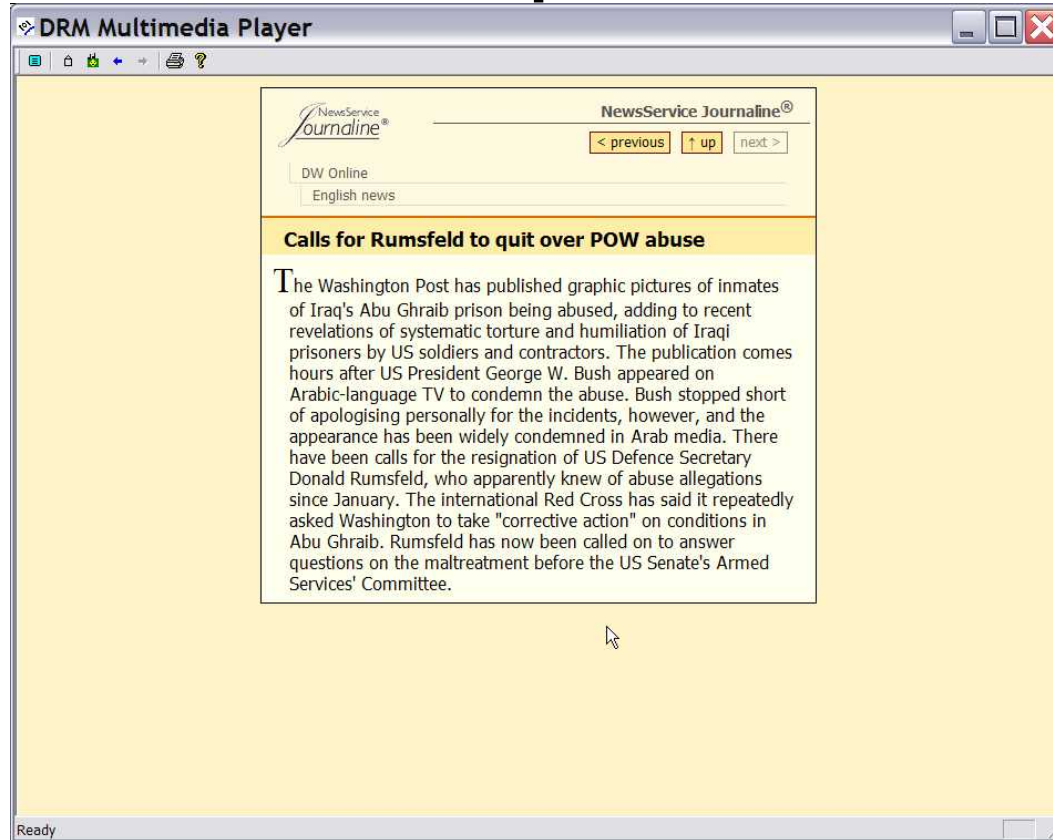
→ Journaline can flexibly deliver all kinds of text content

Journaline[®] – Content Sources



- **XML files**
static content and menu structure definitions,
Journaline specific XML format,
triggered or scheduled updates
- **RSS feeds**
half-dynamic content with
periodic update from the Internet
- **Real-time feeds**
highly dynamic content
for sports results table / tickers /...,
updates individual page with every re-transmission

Content – Example DW online

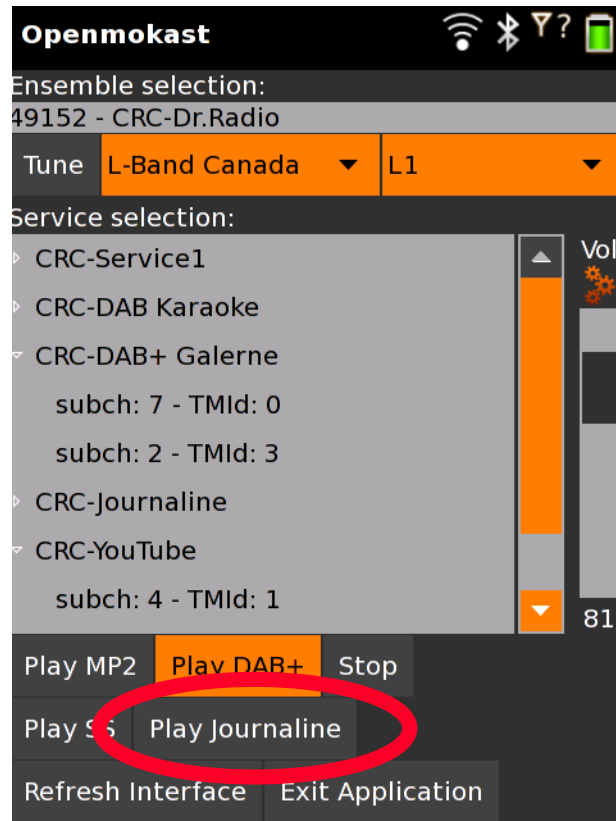


Call for Rumsfeld to quit over POW abuse
The Washington Post has published graphic pictures of inmates of Iraq's Abu Ghraib prison being abused, adding to recent revelations of systematic torture and humiliation of Iraqi

Rendering examples:

- PC based receiver (XML/XSLT re-transformation)
- Embedded Receiver

Journaline[®] – ‚OpenMokast‘ DAB Receiver



- Open Source Project:
www.openmokast.org
- Based on Openmoko
mobile phone platform
www.openmoko.com
- Initiated by CRC Canada
www.crc.gc.ca/en/html/mmb/home/home



Journaline[®] – First Commercial Receiver



- Features
3.5 " graphics screen,
Journaline,
MOT Slide Show
- DAB support on roadmap:
Di-Wave 400, December 2009



UniWave Di-Wave 100

Graphic by www.universal-radio.com/catalog/portable/0023.html

Journaline[®] – First Commercial Receiver



Journaline[®] – Analog Devices DAB Multimedia Platform



- Digital Desktop Audio: **Mobile Entertainment / Digital Radio**
- Support for DAB (classic/DAB+/DMB), DRM (DRM30/DRM+)
- Integration of screen, WiFi, navigation GPS, etc. possible; Journaline being integrated
- Platform available for receiver manufacturers

Journaline[®] – Broadcast Status



Standardized by WorldDMB Forum (2007-09)
→ freely available ETSI document **TS102 979**
→ **suitable for any broadcast platform**



Mappings available for

- DRM – Digital Radio Mondiale (part of standard)
- HD Radio (USA)
- Mobile.Info / TPEG (TISA), ...



Encoder / broadcast server infrastructure:

- Fraunhofer DAB/DMB, DRM ContentServer



Journaline[®] – Broadcast Status



Broadcasts on air:

- Digital Radio Nord
- Bayern Digital Radio
- RTL Group (bce)
- RTL Italy
- Deutsche Welle
- DeutschlandRadio
- bit eXpress
- VTcom
- SWR

- ARD broadcasters, e.g. Bayerischer Rundfunk
- ROCKANTENNE
- Arqiva (UK, demos)
- BBC World Service
- RAI, ...

Planning stage:

- Switzerland
- China
- USA, ...





www.journaline.info

Journaline live-broadcast during the Beijing Olympics 2008

Journaline[®] – AUDI Personal News



- Availability of text information while driving
- Based on standardized Journaline broadcasts (efficient encoding/transport)
- **Speech-Playback** (In-Car Text-to-Speech engine)
- Speech-Commands
- **Personalization** (automatic information on update)



DAB Surround



DAB Surround & Journaline – Enhancing the Digital Experience

Thank you.

→ See our exhibition in the reception area and
and experience the in-car demonstration



Audi
Vorsprung durch Technik