



Audio for DVB-T in Poland

Ignacio Sanz, Executive Broadcast Systems

Intro

Broadcast experience

- Dolby has been involved in digital broadcast from the early days. Helping broadcasters to build a chain from production through distribution and transmission all the way down to the home receivers. Allowing them to broadcast high quality audio including 5.1.
- Several hundred channels are on-air with Dolby Digital audio.

Wider audience

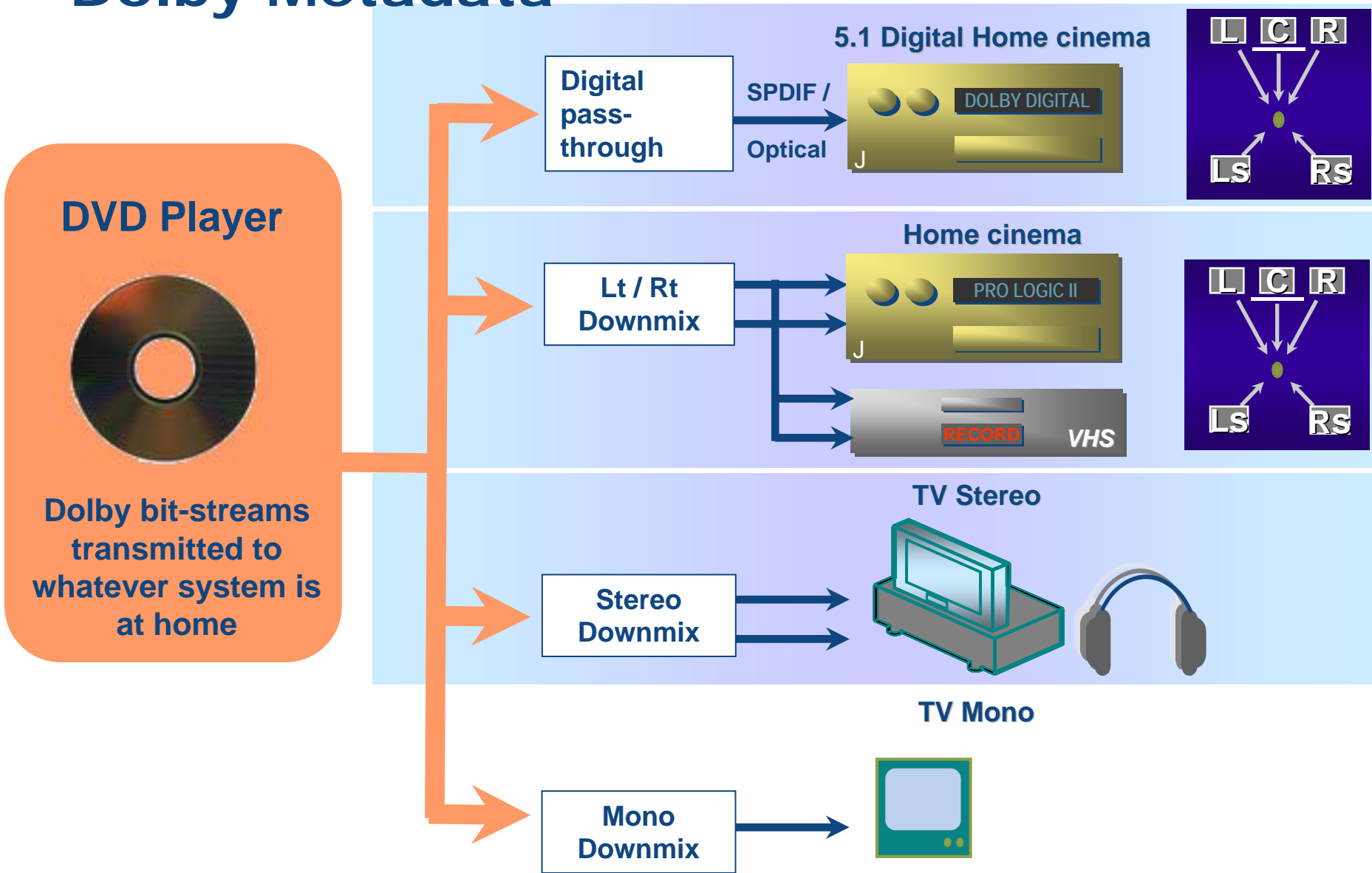
- Currently we are making high quality audio possible in new media bringing the Dolby benefits to a wider audience; online, mobile, video games, etc.

DVD audio formats:

- MPEG1 L-II
- Dolby Digital (AC-3)



Dolby Metadata



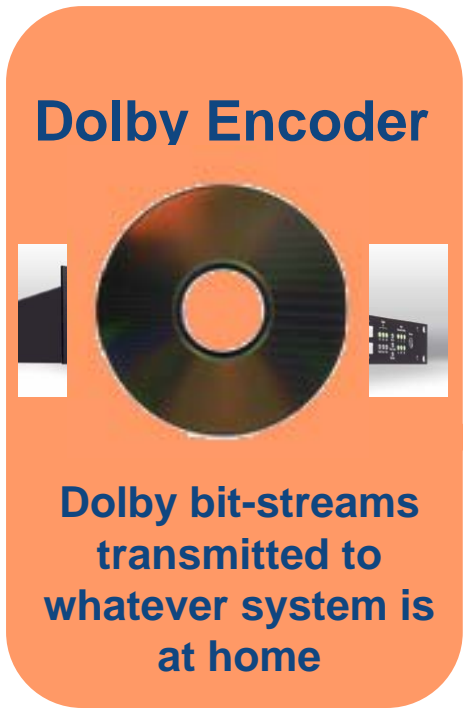
DVB audio formats

- MPEG1 L-II
- Dolby Digital (AC-3)
- Others

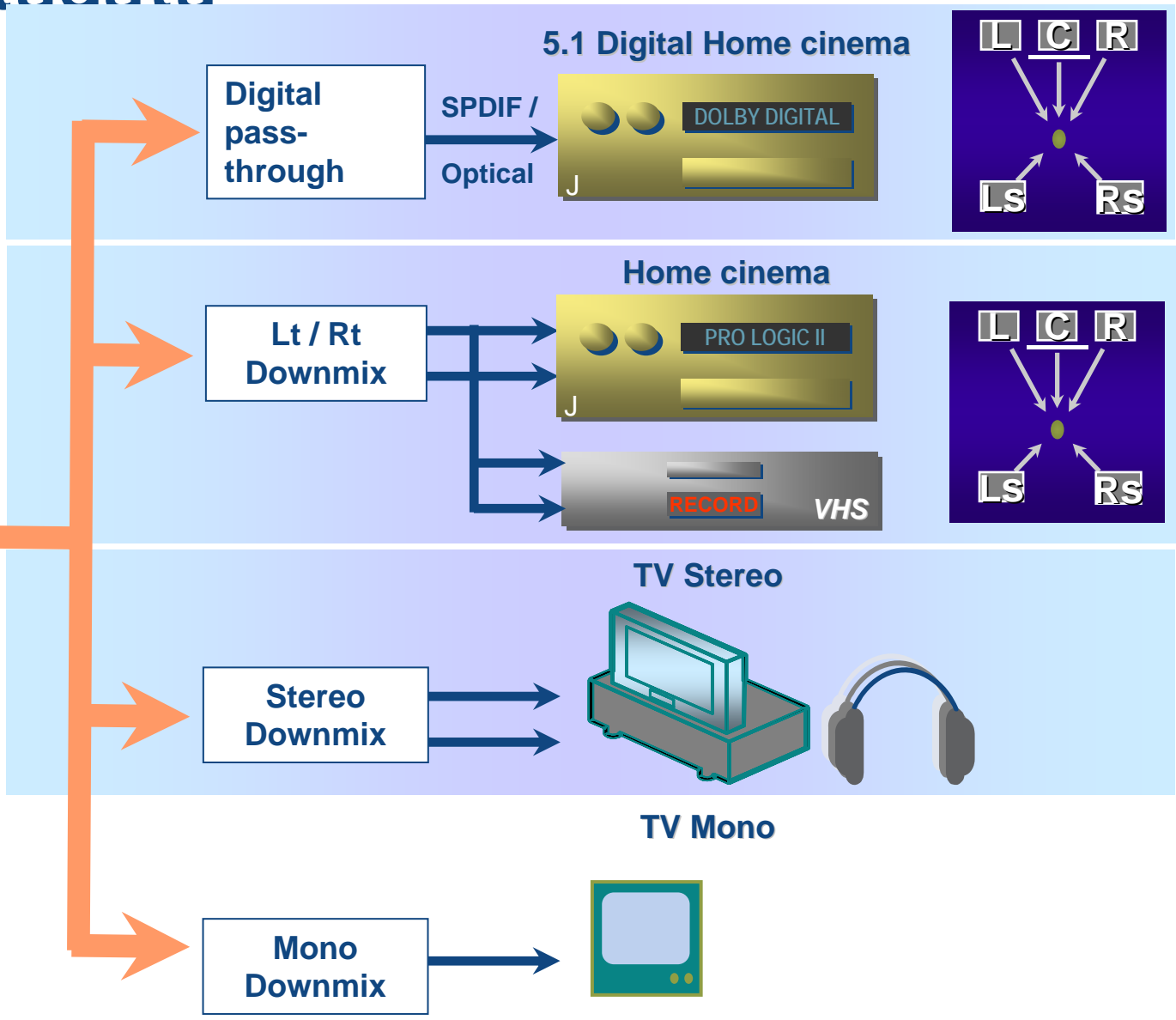


Dolby Metadata

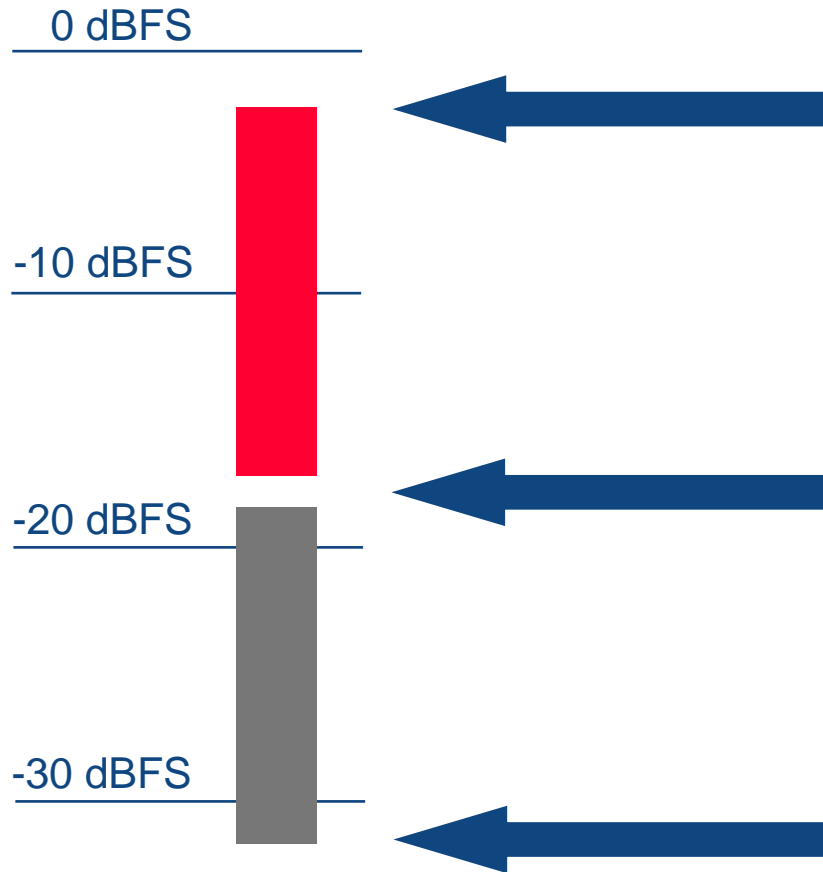
Dolby Encoder



Dolby bit-streams transmitted to whatever system is at home



Dynamic range - Loudness



Peak programme

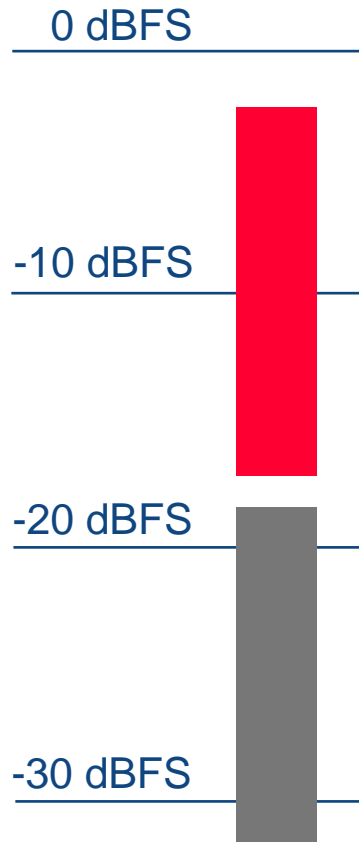


Average loudness level



Lowest level

Dynamic range - Loudness



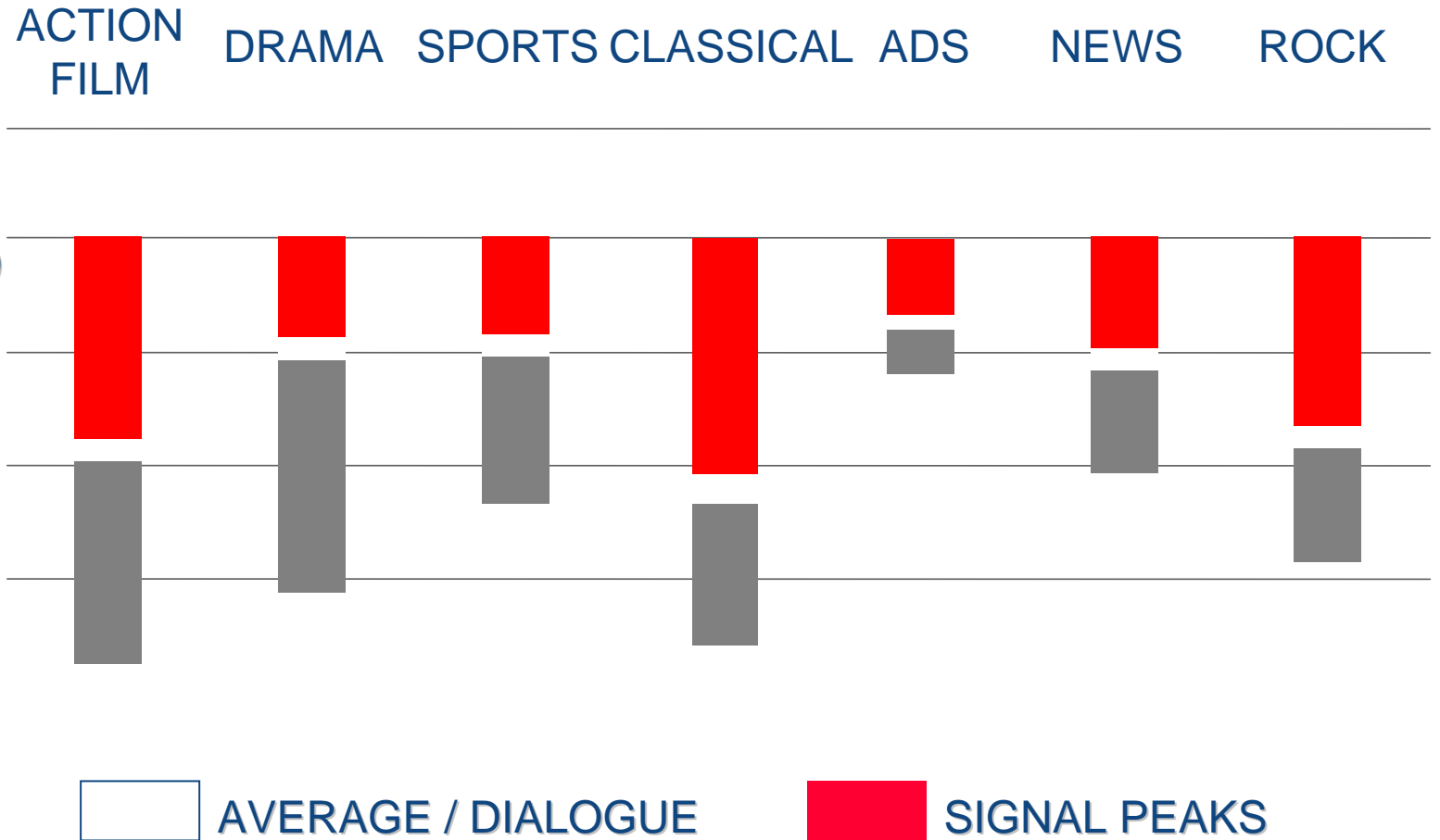
Peak meters



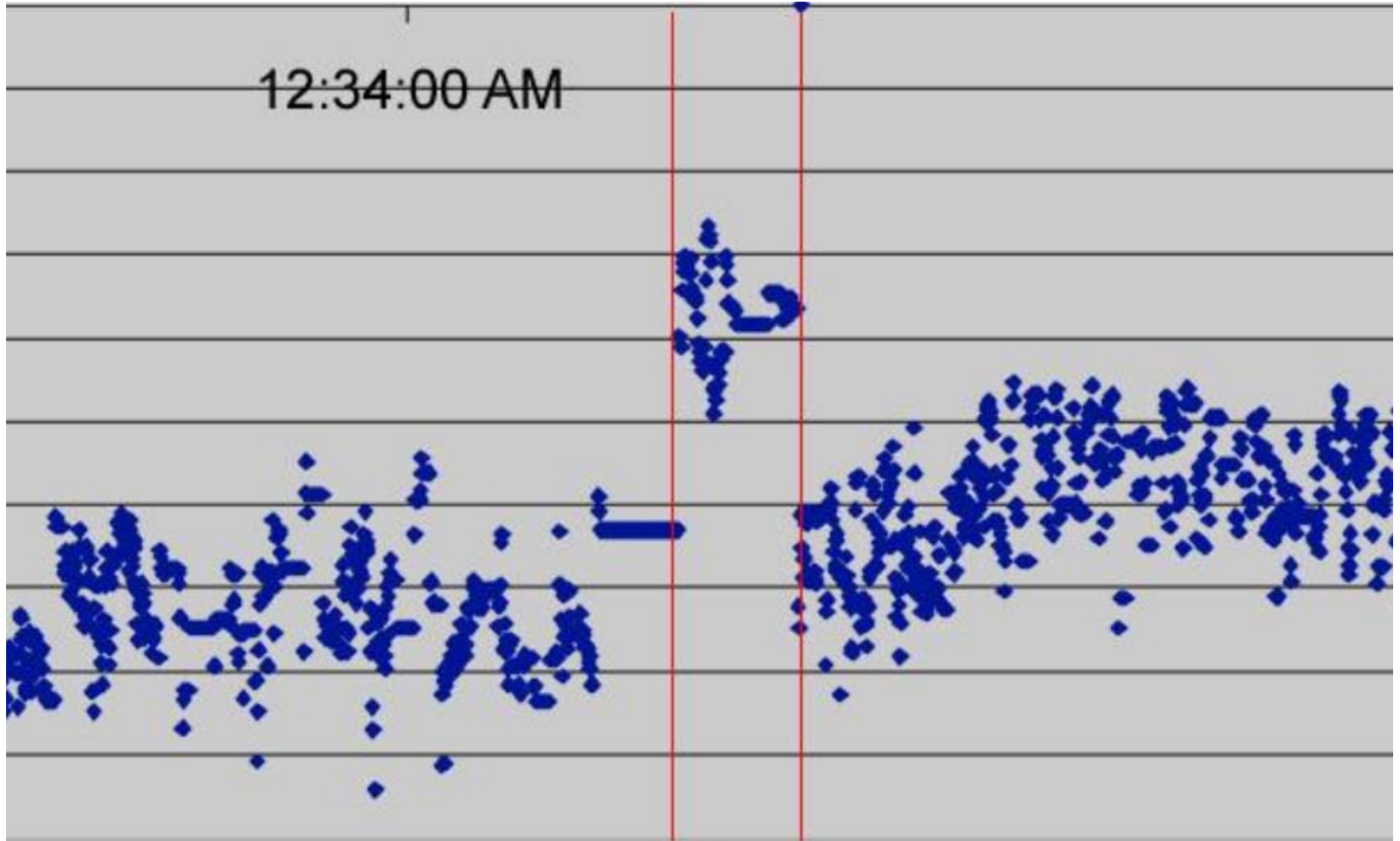
Average loudness meter



Loudness meter



12:34:00 AM

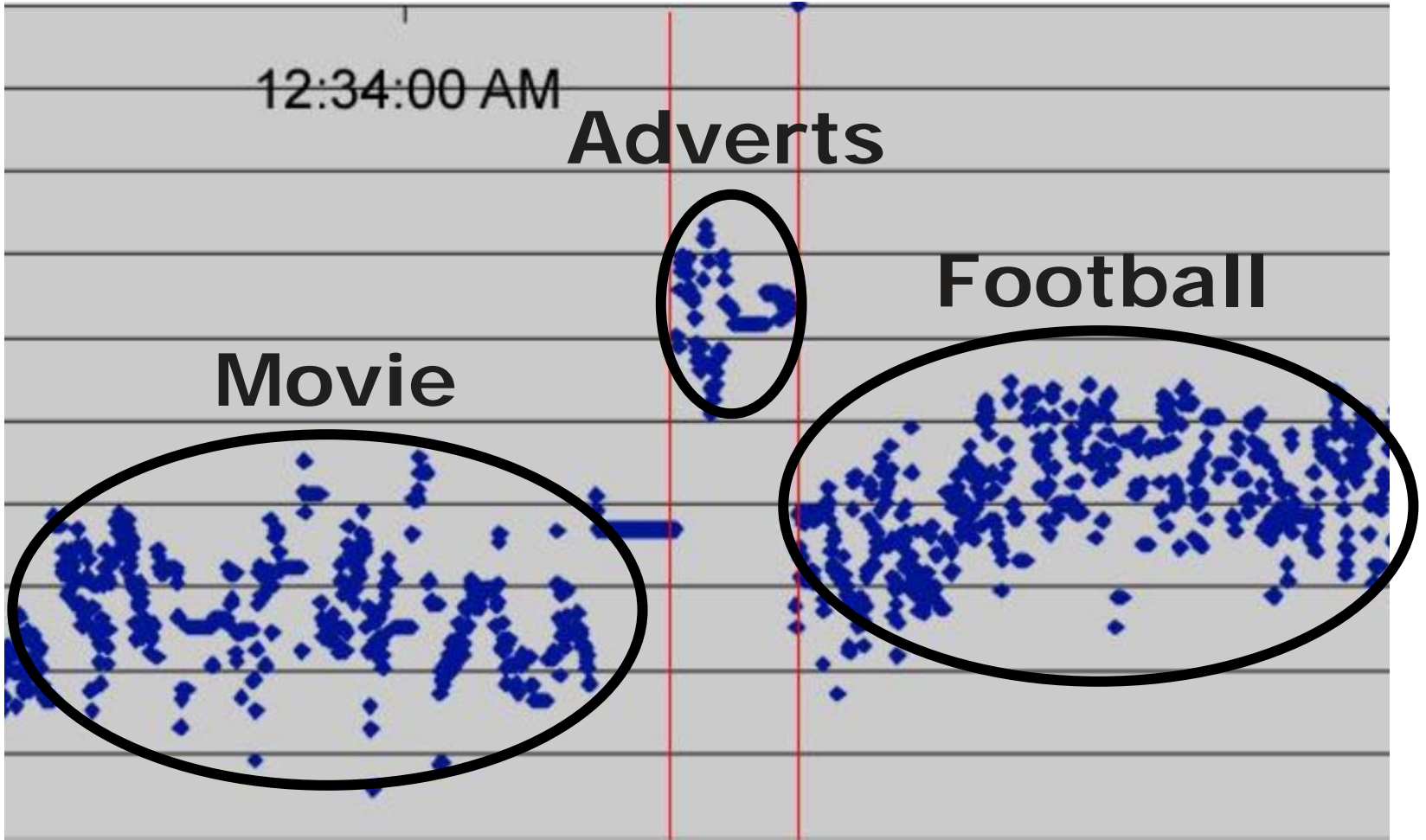


12:34:00 AM

Adverts

Football

Movie

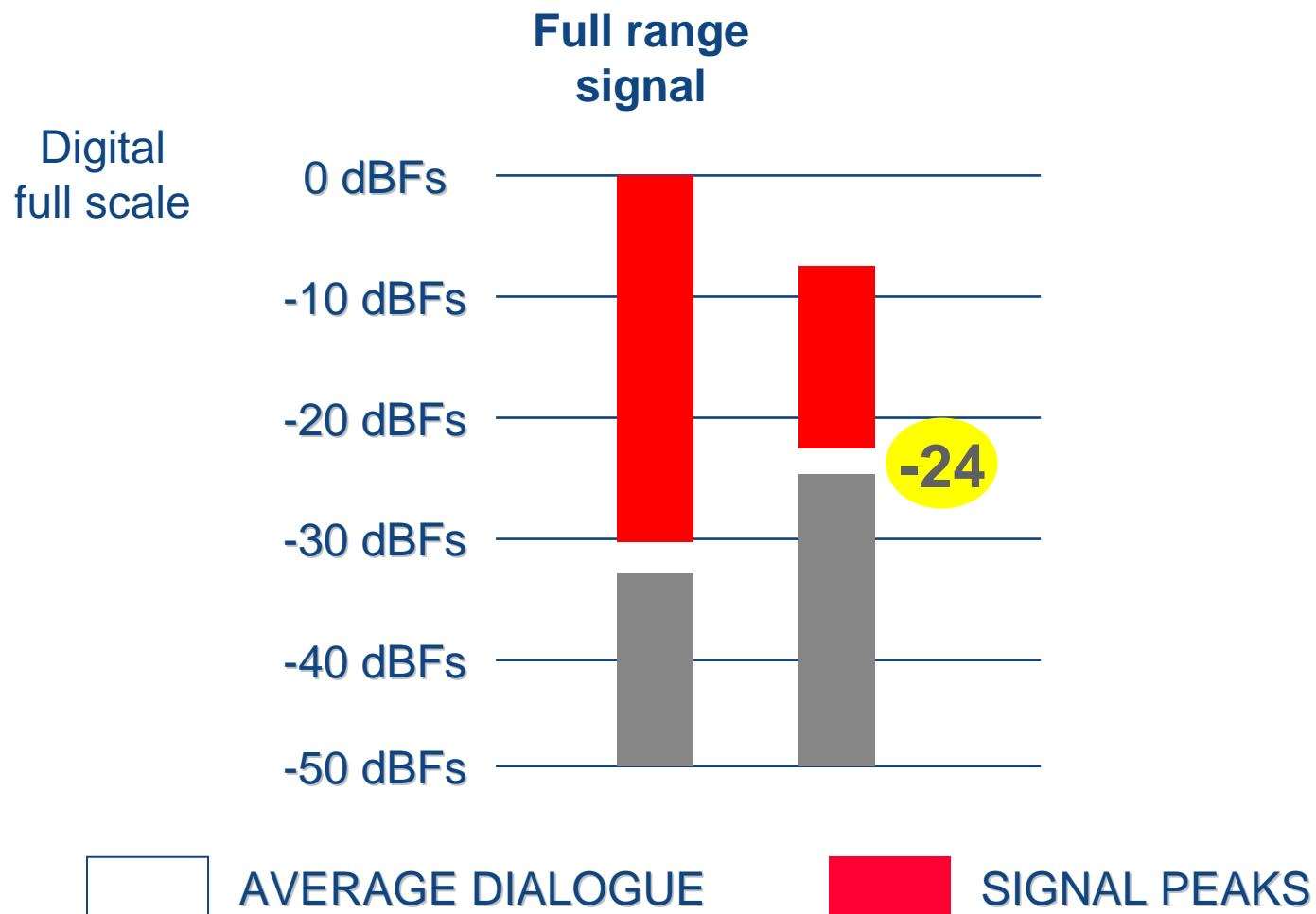


12:34:00 AM

18dB

11dB

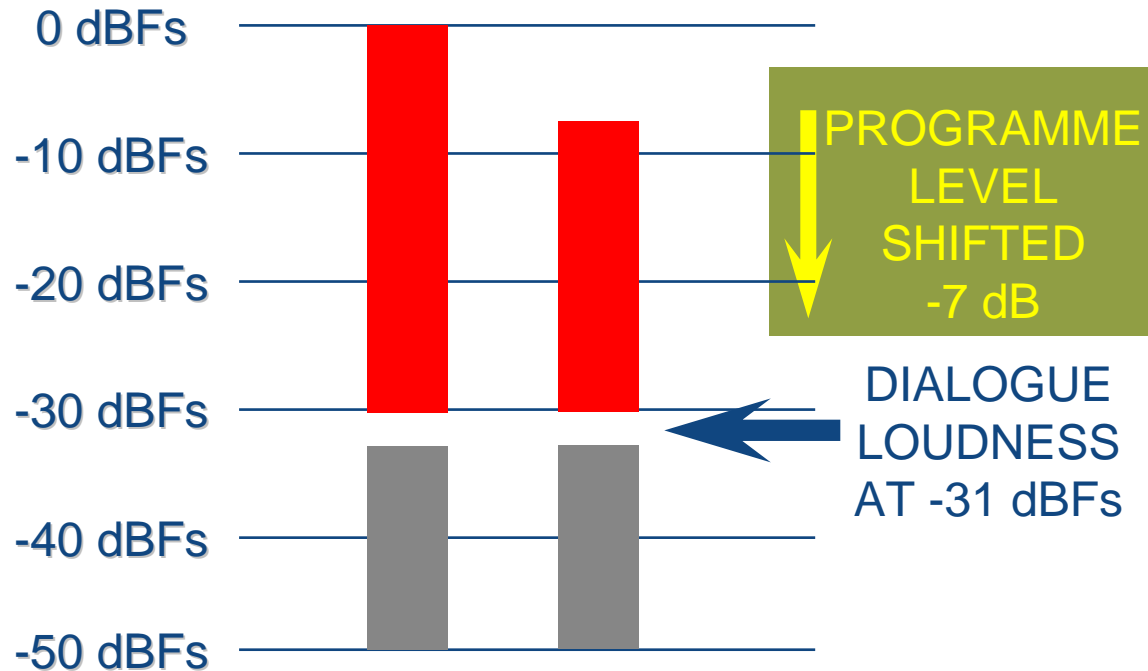
Dialogue Level Metadata



Dialogue Level Metadata

WITH
DIALOGUE NORMALIZATION

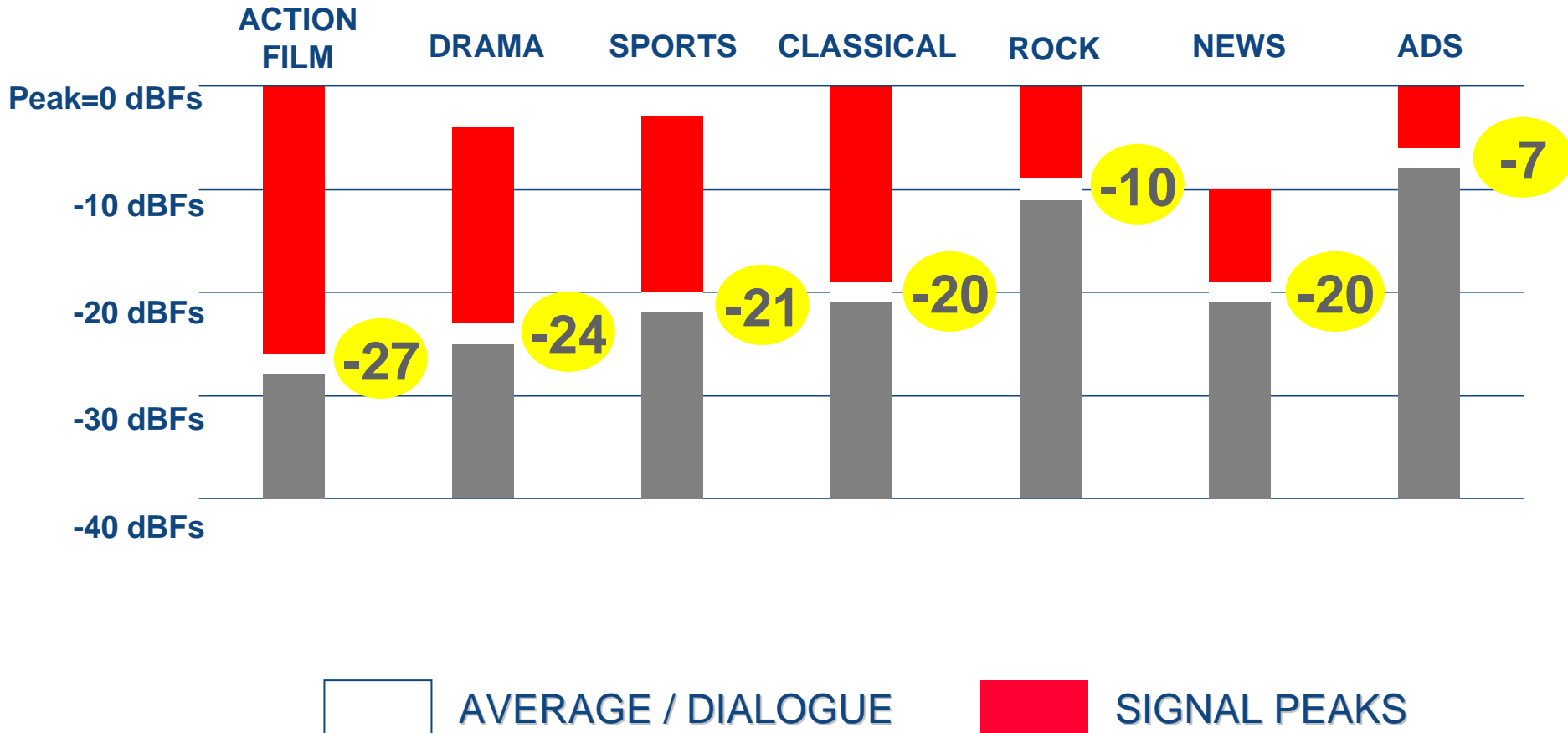
Digital
full scale



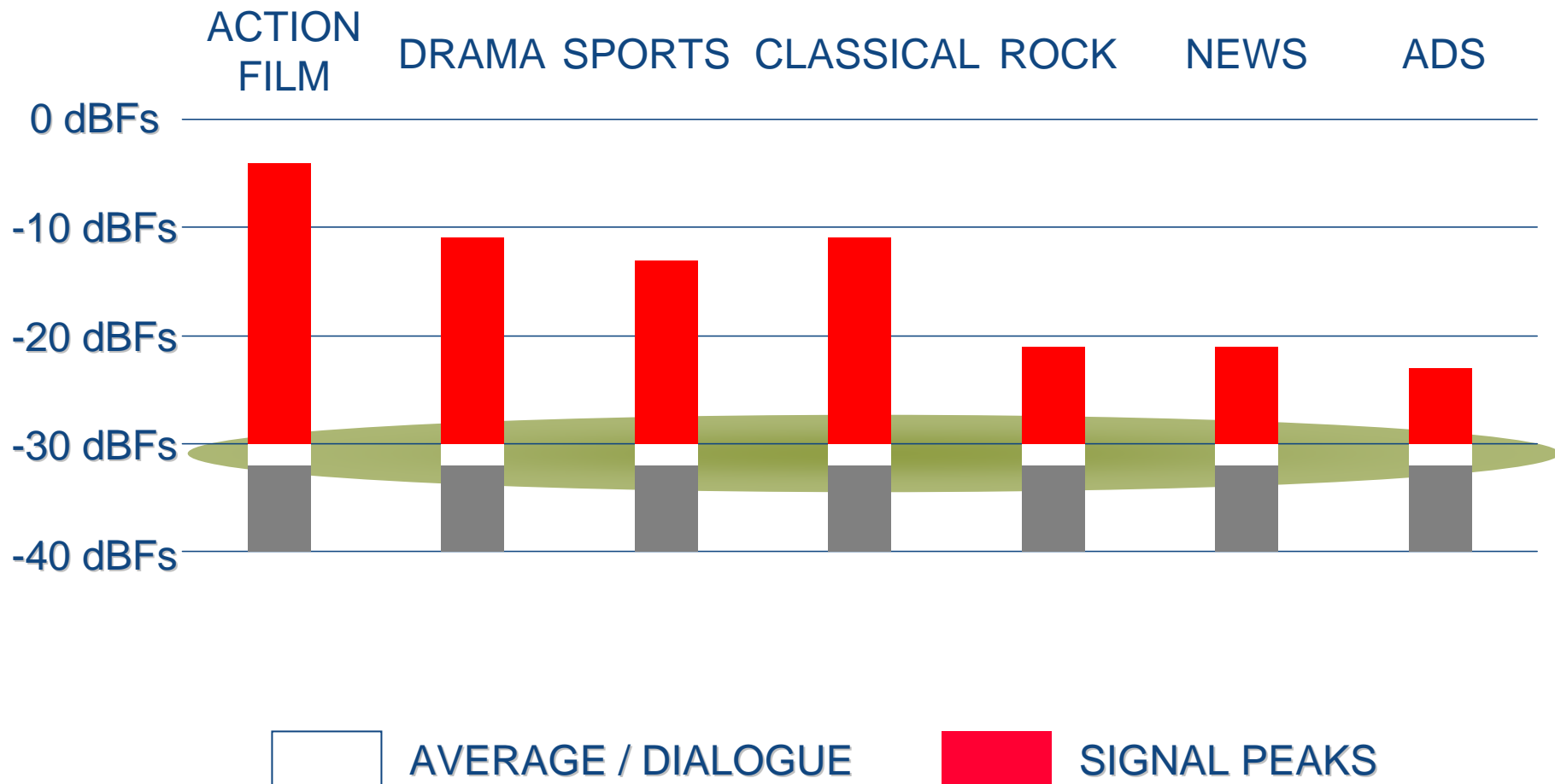
□ AVERAGE DIALOGUE

■ SIGNAL PEAKS

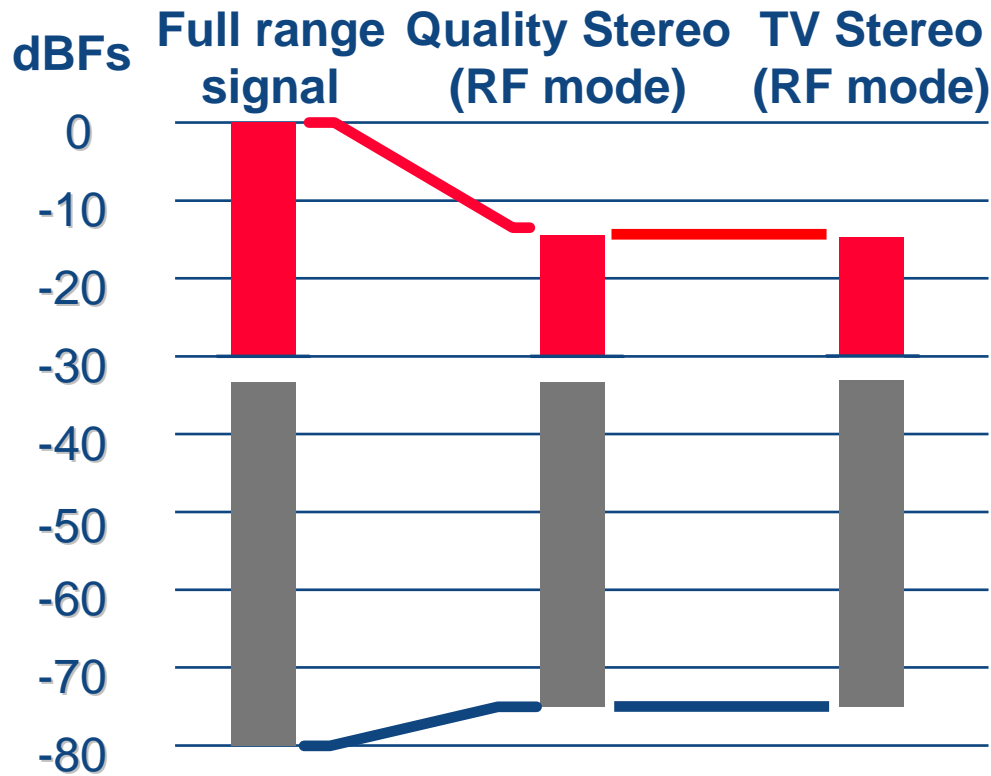
Some Typical Audio Signals



Broadcast with Dolby metadata



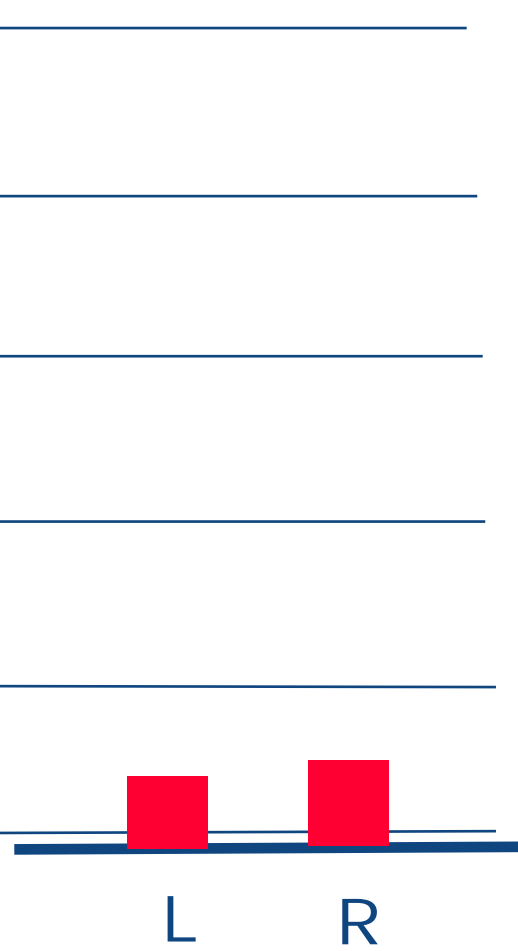
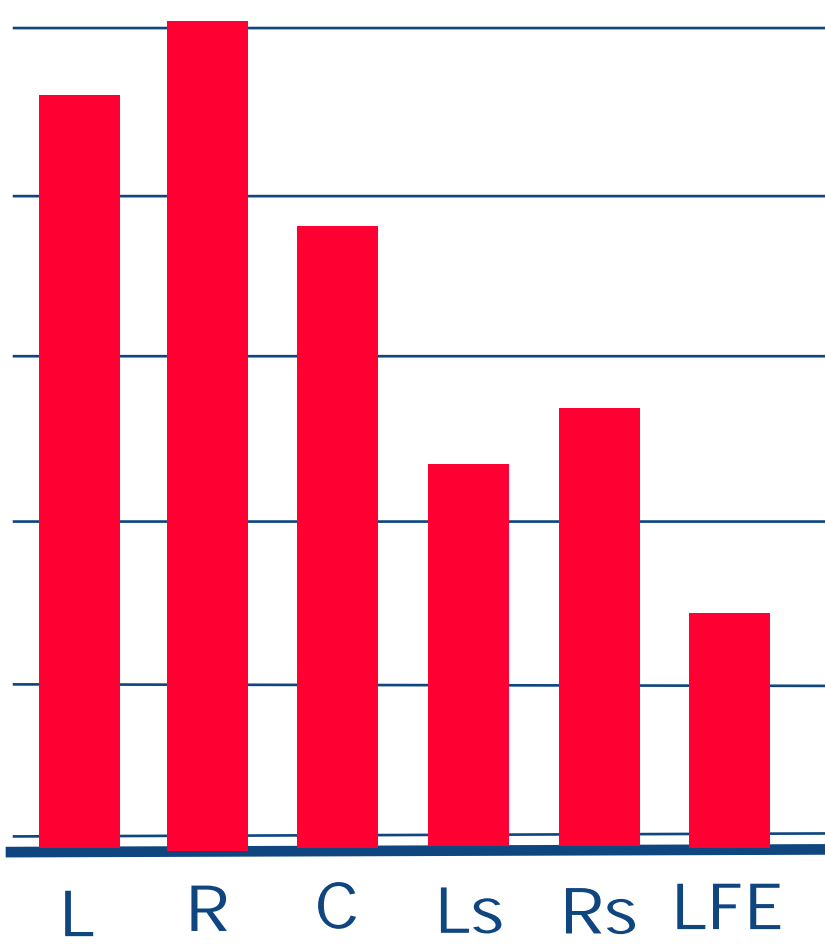
Dynamic Range Control



Dolby

MPEG1 L-II

30 dB
25 dB
20 dB
15 dB
10 dB
5 dB



CYFRA+

SKY CINEMA

CANAL+ SPORT

ORF 2

ORF 1

ORF 1
RADIO ÖSTERREICH

6 HD

france 4 sky HD

премьер

alpha

HD SAT 1 HD

svt HD

CANAL+
LEBOUQUET

funkhaus
europa
103.3

Das Erste

WDR

m r r

FIGARO

arts world

RTL

SKY SPORTS HD

BBC HD

ANIXE HD

CANAL+ EN HD

TF1 NEXT: HD

MEDIASET

NATIONAL GEOGRAPHIC CHANNEL HD

3sat

SWR
SÜDWESTRUNDFUNK

TELECLUB
DIGITAL TV ENTERTAINMENT

svt

TVP
POLONIA

TF1
HAUTE DEFINITION

TPS
star

Discovery
HD

PREMIERE PHILIPS
HD SPORT

PREMIERE
DIREKT

PREMIERE
HD FILM

PREMIERE 1

PREMIERE HD

tvn
GRUPA ITI

hr2
kultur

nrj
12

yes.

6

ZDF

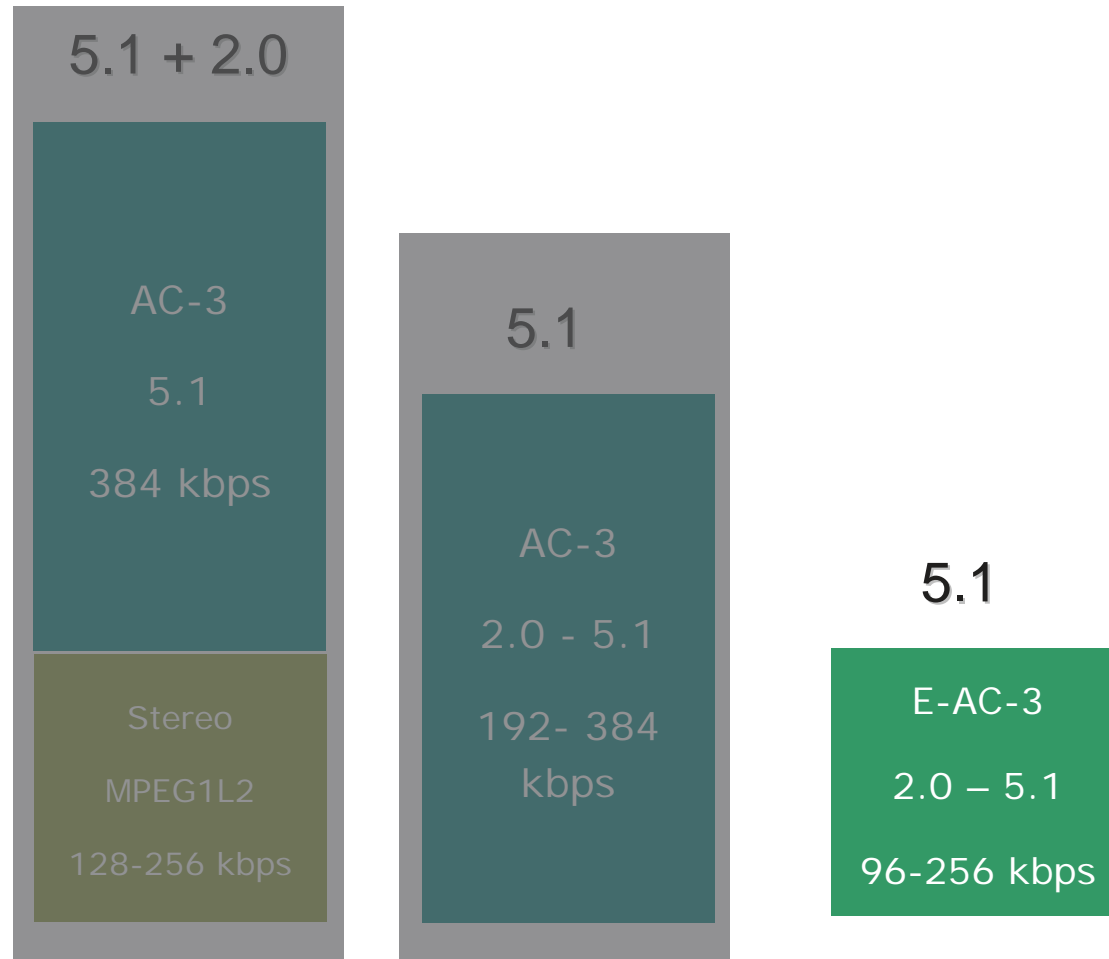
LIVE
Radio Eins Live

Disney
CINEMAGIC

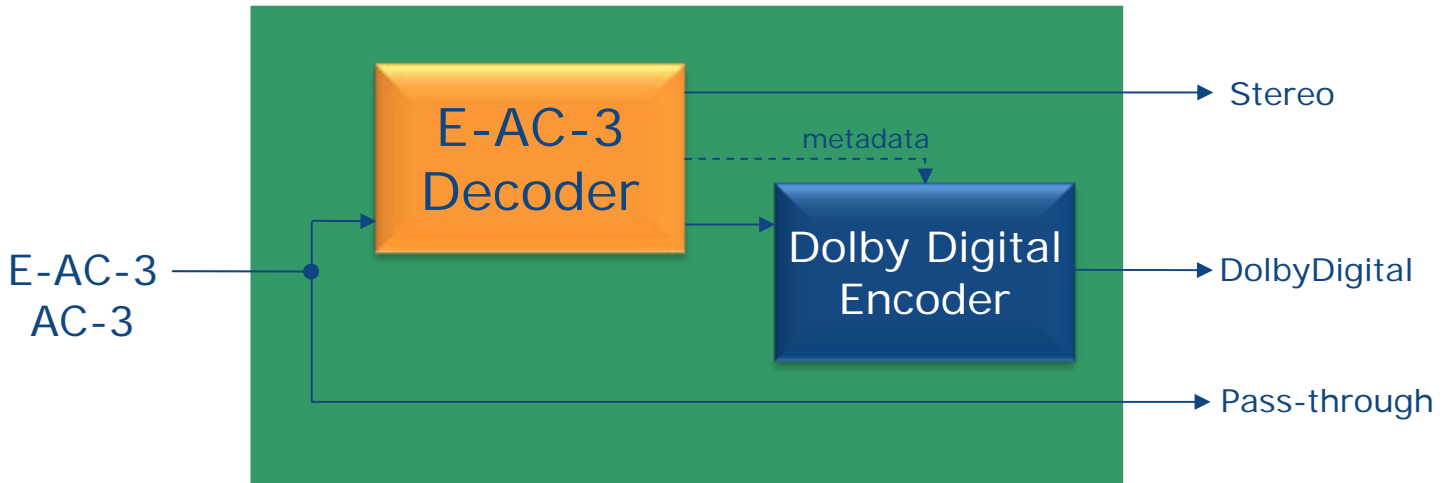
Disney
CHANNELS

DOLBY

~576 kbps



Dolby Digital Plus decoder



5.1

E-AC-3
2.0 – 5.1
96-256 kbps

Summary

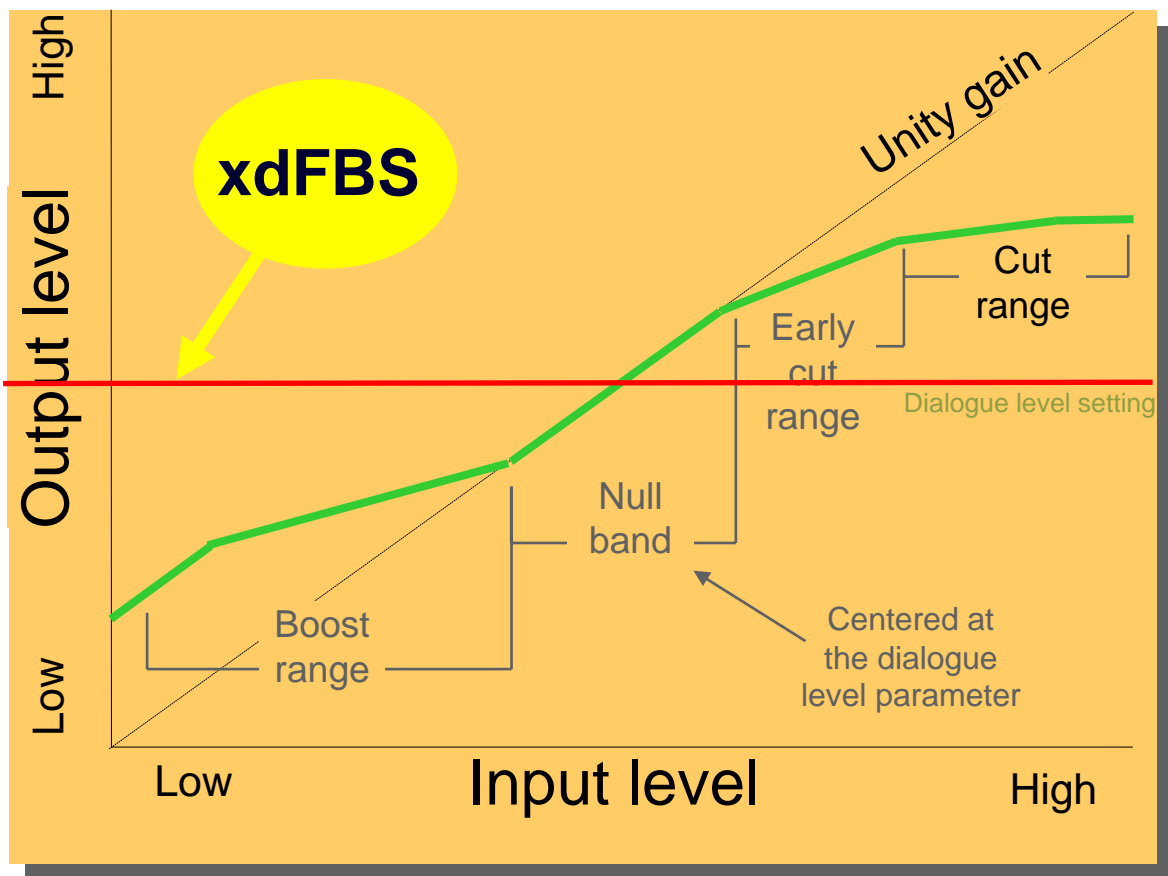
Next generation audio for the Polish DVB-T platform.

- Multichannel audio - no need for simulcast.
- 5.1 audio at 256 kbps (comparable to MPEG1 L-II stereo data rate).
- Loudness consistency across programs and between channels.
- Full dynamic range.
- Possibility of adding Audio Description with very little impact on data rate.

Challenge

- Measuring loudness - setting correct metadata
- Moving audio and metadata.

Dialnorm and DRC together



Stereo Downmix

