

Are you real – or is it 3DTV?

3DTV in DVB, EBU, and NAB



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Chair DVB CM-3DTV



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Reminder of 'Who does what'?

- The DVB project agrees specifications for **broadcast signal formats** (has lots of meetings and great lunches).
- Three stage DVB process: 1. What does it need to do to be a business success? 2. What technical specification can do that? 3. Does it do what we want?
- The ITU-R prepares **Reports and Recommendations** (has long meetings, no lunches, and lots of documents)
- The EBU is looking at **production guidelines**, and 2nd and 3rd Generation 3DTV.

Everyone uses the same 'model' for
3DTV development. **Hooray!**

Conventional Service Compatible (CSC) Level 3	2D HD +delta	New set top box/ird/3D display		
Frame Compatible Compatible (FCC) Level 3	Frame Compatible + delta	New set top box/ird/3D display		
Conventional HD Frame Compatible (CFC) Level 2	Frame Compatible	No new set top box, but 3D display		
Conventional HD Display Compatible (CDC) Level 1	Colour anaglyph	Visene only - No new equipment		
	Plano-stereoscopic 1 st Gen	Multi-view 2 nd Gen.	Integral TV 3 rd Gen.	Object Wave 4 th Gen.

‘Frame compatible’

LEFT

RIGHT



Side-by-Side

LEFT

RIGHT



Top and bottom

Where are the specs?

- ITU-R Level 1 does not need a specification.
- ITU-R Level 2 (Frame Compatible) termed DVB Phase 1. **Completed and issued by DVB. Go to www.dvb.org for download**
- ITU-R Level(s) 3 (FCC, CSC) termed DVB Phase 2. **Requirements being prepared now.**

The Elements of the DVB Frame Com spec.

- Blood, Sweat, and Tears from David Daniels, Nick Tanton, Alex Adolf, and many others
- THREE MAIN ELEMENTS
- The 3D Frame Compatible **formats**
- The **signaling** for them.
- How to handle **closed captions** - 'positional information for the receiver'

The Magnificent Eight!

DVB 3DTV Frame Compatible Formats

720p@50, 60 - Top and Bottom

1080i@50, 60 - Side by Side

1080p@24 - Top and Bottom

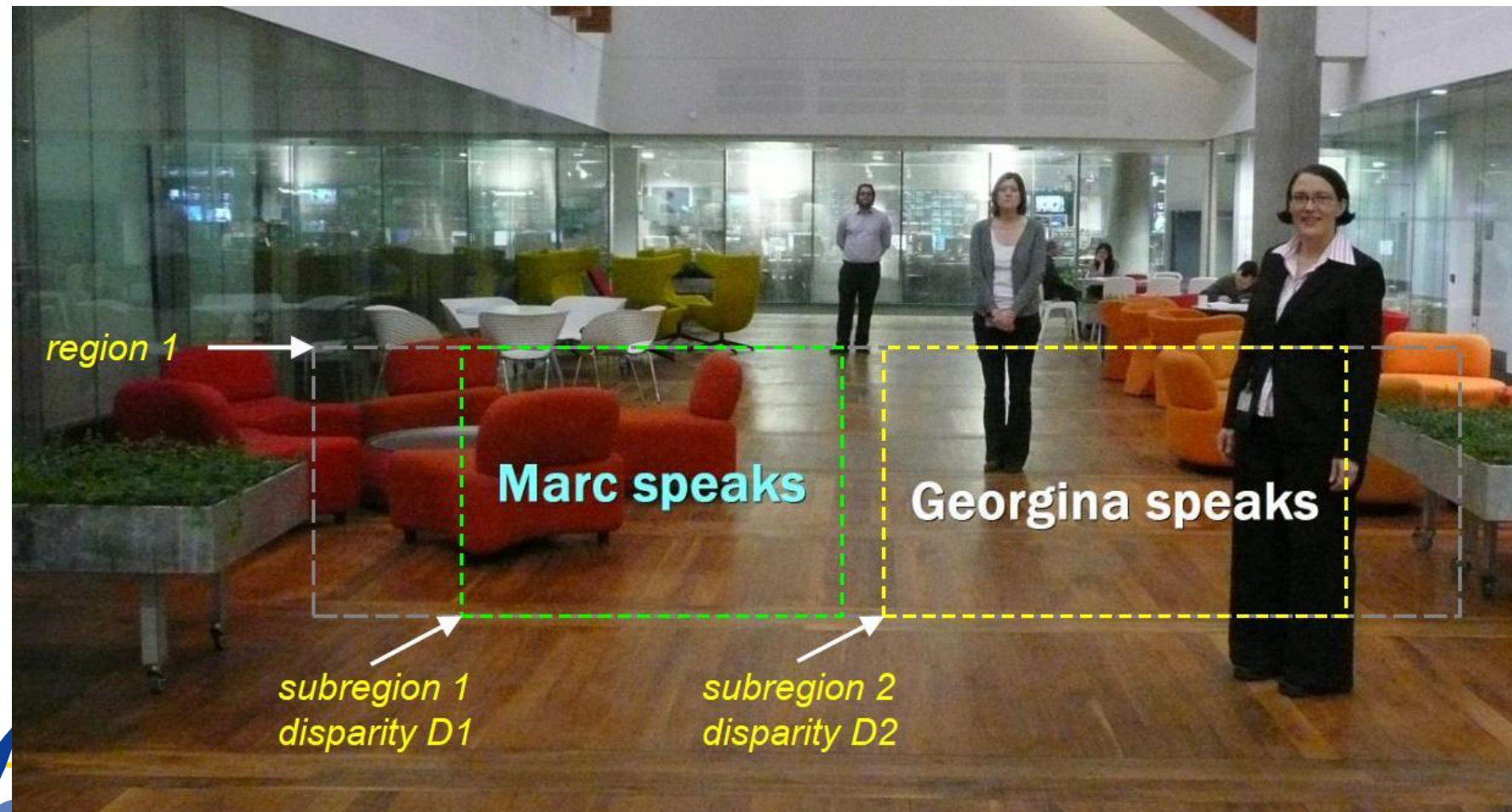
720p@50, 60 – Side by Side

1080p@24 - Side by Side

Why so many? There are circumstances where each of them will produce the highest quality results for the viewer

The definition of cc sub-regions

- The sub-regions defined which may be assigned different individual disparity values
- No signaling means: the stream has been coded to provide subtitles intended for 2D
- Each region can contain one or more sub-regions referenced to that region



The Phase 1 optional 'bonus' system.

- A 'service compatible' **option** for the frame compatible Phase 1 environment.
- Signaling (Frame cropping and sample aspect ratio) may be used by broadcasters to instruct the receiver to 'de-anamorphize' one of the stereo images, and output it as a normal 2D image.
- Existing HDTV STBs may not all re-act correctly to the signaling.
- Probably its use will be a '**national decision**'.
- Included in the latest Italian DTT spec.

Phase 2 3DTV/ITU Level 3

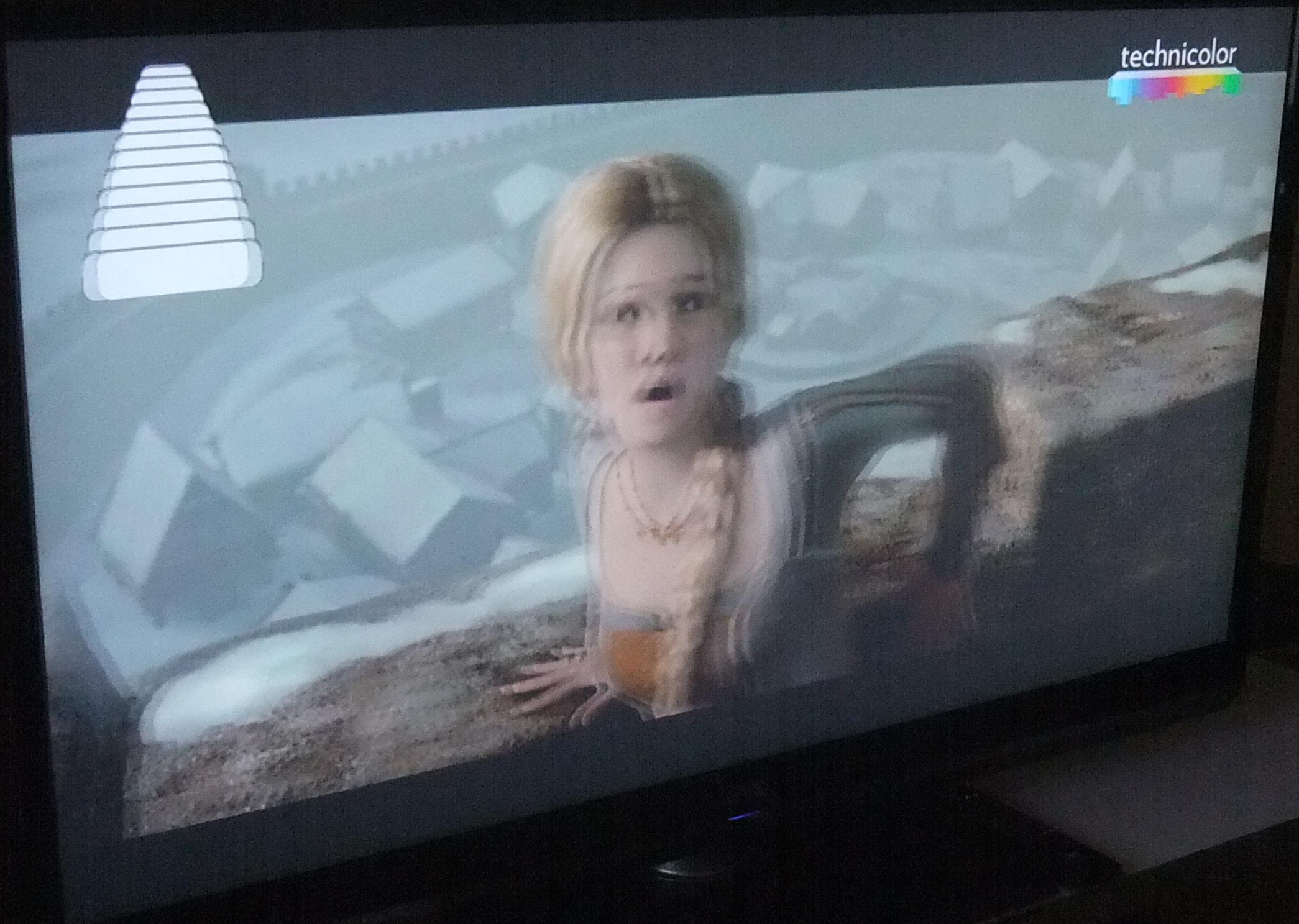
- What about the world where using an existing set top box is NOT mandatory?
- Can there be a new system with significant commercial advantages?
- This is under discussion now in the DVB Project.
- Current plan is for commercial requirements to be agreed in 2011.

What are the issues for Phase 2 3DTV?

- **How much 'more' do we need for Phase 2, to be successful?**
- What **quality level** is needed?
 - normal 'HDTV' for L and R (720p/1280/50,60 1080i/1920/25,24 1080p/1920/25,24)?
 - 1080p/1920/50,60 For L and R?
- What **compatibility** is needed?
 - L, R separate
 - 2D HDTV reception?
 - FC 3D-HDTV reception?
 - Both of above?
- Should there be provision for viewer **depth range adjustment**?
- Should there be both **broadcast and download** options?
- What sophistication for **multimedia** is appropriate?
- Should we wait for next generation compression **HEVC**?

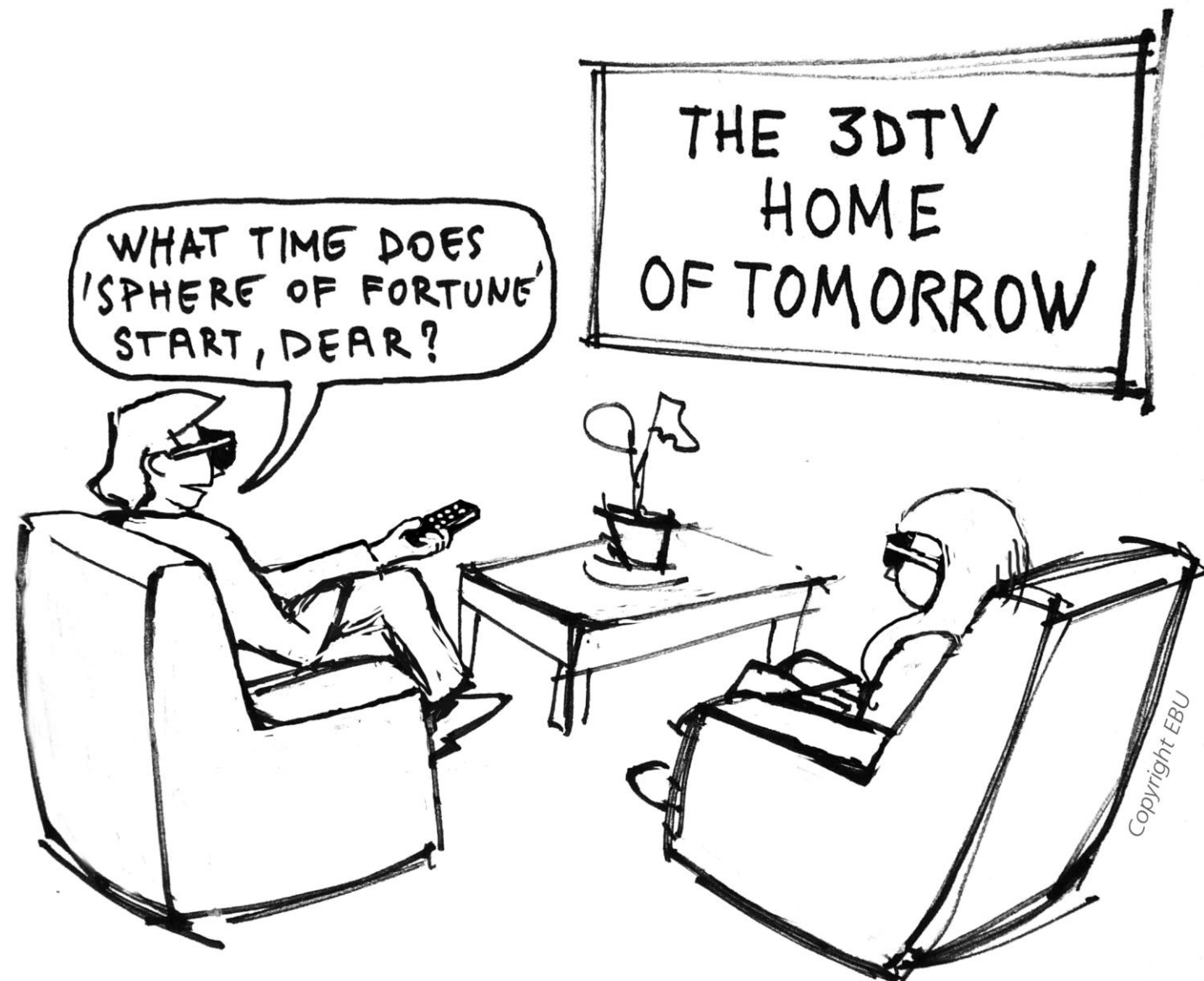
What was to see at NAB 2011?

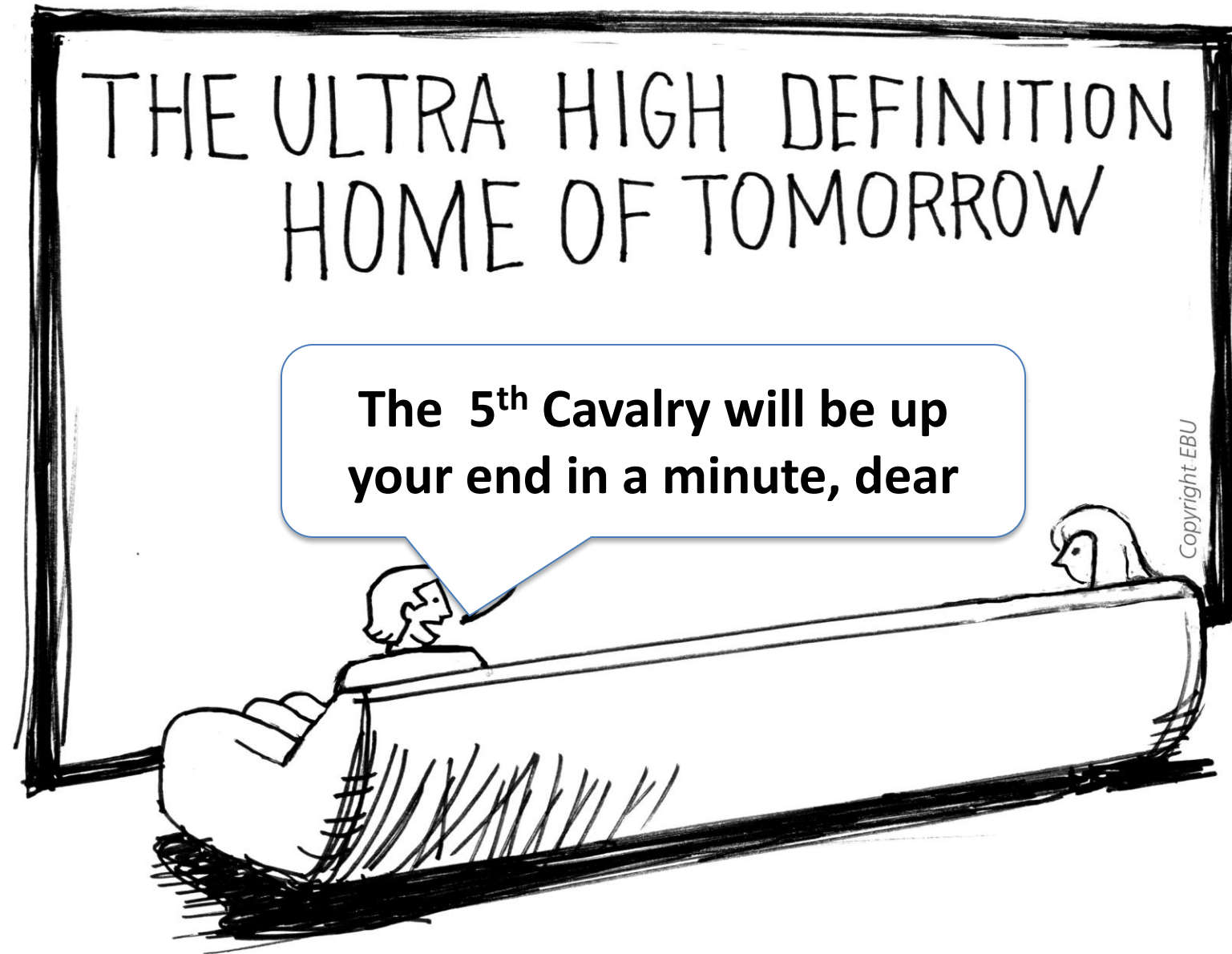






Can we say anything about the
relationship between UHDTV and
3DTV?





Your take-aways please...

- The DVB Phase 1 commercial requirements and specification are available on the DVB web site.
- The DVB Phase 1 specification has been submitted to ETSI, the ITU-R (and lots of others).
- DVB members are warmly encouraged to take part in the Phase 2 specification work.
- Thank you!

Opportunities

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