



**EMMA**  
european mobile media association

# Judgebook

Multimedia

2024



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## Welcome to the European Mobile Media Association

### 5.0 Preface

This manual is designed to describe the exact procedure, used for judging a vehicles Multimedia system, according to EMMA Rules and regulations and will be continuously updated.

**Introduce yourself in a polite way to the competitor.**

Follow the procedures and rules in chapter 4 as described in pages 38 & 39 in the Rulebook.

- **Pre-Judging Check**
- **Check Charger Y / N**

Ask the competitor to disconnect the battery charger (if any) from his/her system and document it into the checkbox on the score sheet.

- **Verification of all Multimedia equipment securely mounted Y / N**

The remote-control unit doesn't necessarily have to be mounted fixed.  
Pay attention to displays / players that are not installed during regular driving operation.  
If this box is not checked, the install judges should be informed to investigate more deeply.

- **Grilles front on / off**

The judge will mark the state of judging, the install judges may validate during their judging if the car was found in the same condition / request the competitor to set the car into the state as under sound/picture judgment

- **Calibration of Volume**

The Competitor suggests the Volume to be listened at by the Multimedia judges.

**The Judges should use this Volume!**

**Only** in case that the suggested Volume is **too loud** (more than 80dB unweighted slow measurement with pink noise), the Judges must take a measurement to correct the Volume. In case the suggested volume is too low, it is the competitor's decision to keep it or ask you to adjust the volume.

- **System handling**

**Only the controls as following will be considered for judging**

- Volume +/-
- Software-menu navigation
- Pause/mute
  
- If all above mentioned controls are available (at one device) but are located at different places, this will be judged as one (1) control unit. For example, a source unit with flip-out touch screen with menu navigation but the volume is a separate button under the screen.
- An additional remote-control unit doesn't necessarily have to be mounted fixed.

All points remain awarded if all above mentioned controls can be operated from 1 control unit.

Per additional control unit (e.g. volume knob in the center console, rest on the screen), 2p will be deducted.

- **System noise**

Listen for noise that is somehow emulated from or by the audio system and that is not recorded on the current official EMMA Media

Potential noises can be:

Rush, hum, hiss, cracks, floor noise, rattling panels, loud fans, mechanical noise etc.

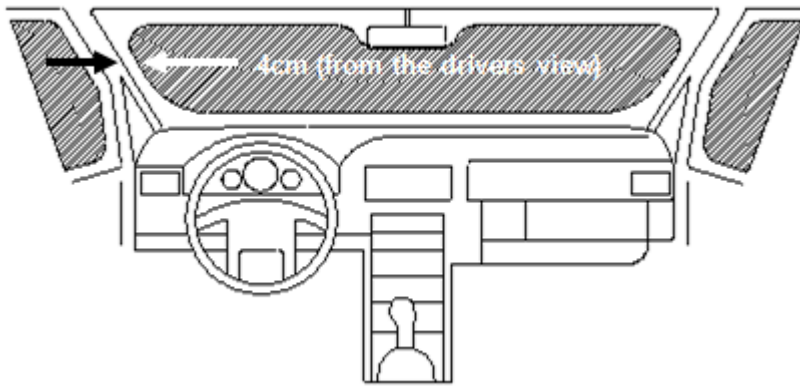
Points are not to be deducted for mechanical noises such as relay clicks, or automatic motorized covers being activated.

**How to score:**

0 points	No audible noise
-2 points	Barely audible noise
-4 points	Audible noise
-6 points	Disturbingly audible noise

- **Limited view**

The judge will sit in the designated position to judge the car and check if anything from the Multimedia systems Installation is interfering with the view. This rule applies to the windscreen and the two front side windows. Windows within the A-Pillar/ additional windows in the front of the front doors will not be considered if the height of the window is not more than half the height of the side window at the highest point (height is measured perpendicular to the road).



If the view is restricted, the Judges deduct 3 Points for each not OK Situation.



not more than 50% height of the side window is allowed



- the view to the side mirrors should not be blocked (if no passenger side mirror installed, the rear view mirror must allow a full view back)

### How to Judge

The measurement will be taken as follows:

- 4 cm perpendicular height taken 90 degrees to the road surface, when checking from the bottom of the screen or the side windows.
- When measuring on the windscreen the measurements are always taken from the edge of any opaque areas which are part of the screen. IE the LAST, smallest black dot
- 4 cm from the A-pillars at 90 degrees to the A-pillar.

### Hint:

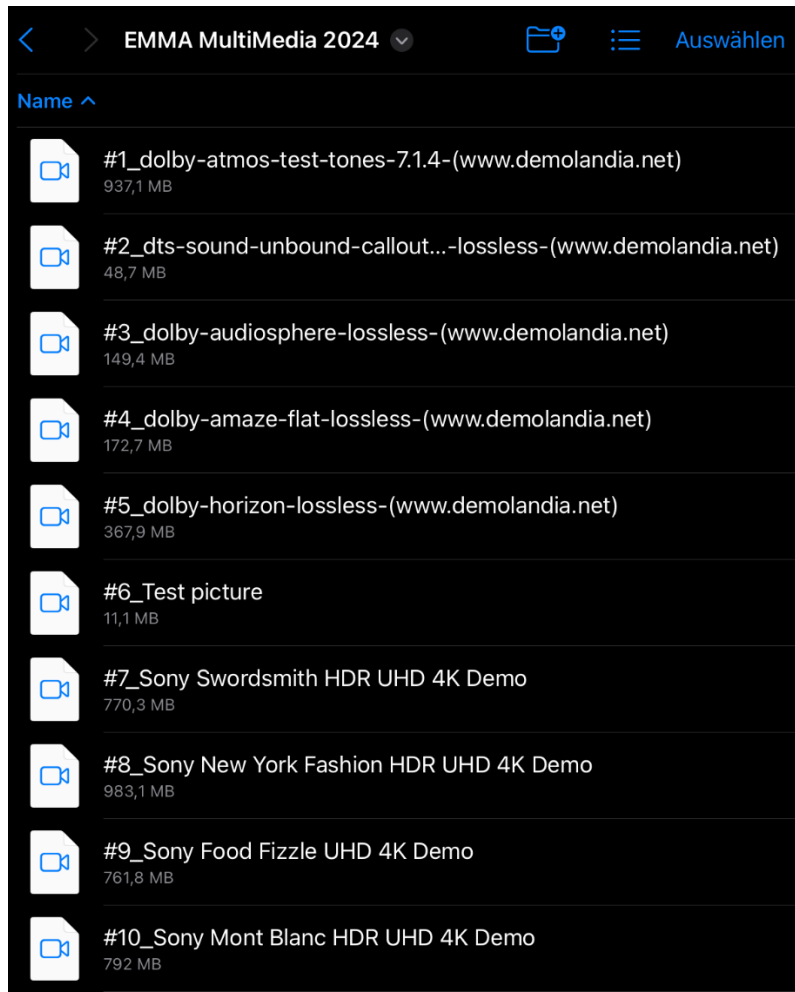
- This does not include the actual screen used for media playback.
- If the audio build is greater than the 4 cm measurement but is still NOT obscuring the road, (e.g. it is obscuring only the car bonnet), then this is acceptable.

### How to score (deduction):

3 points will be deducted per build that obscures the view to a maximum of 6 points.

For judging Multimedia, the following video-sequences will be used:

We encourage every competitor to download the files from demolandia and have them ready for judging process when the Multi Media judge arrives:



### How to proceed:

Play the clips "dolby atmos test tones 7.1.4" and/or "dts-Sound-unbound-callout-11.1-lossless".

Hint to "dolby atmos test tones 7.1.4": The origin of sound changes every approx. 1min, to shorten the process, you can skip to approx.. x.50min, listen to the sound until it changes and hop to the next x.50min sequence.

While you are listening/viewing, circle (!!!) the boxes on the score sheet to correspond to your listening experience. Please refer to and correlate to your seating position (drivers seat / passengers seat / center position)

### System separation

origin of sound matches scheme ( the sound to picture match is judged later), is either at the correct position as expected or from a deviating position as described.



0	stage remains on same height
-1	minor deviation (+/- ca. 10cm)
-2	medium deviation (+/- ca. 20cm)
-3	big deviation (more then +/- 20cm)

### Voice/Timbre matching

We judge, if the timbre of the previous speaker heard matches the timbre of the one actually playing, relative from position to position. Left Front is giving the reference.

0	no deviation in sound
-1	slightly audible deviation
-2	minor deviation in sound
-3	significant deviation in sound

Play the clips "dolby-audiosphere-lossless".

The clip is supporting to indicate where to expect the sound origin from.

While you are listening/viewing, circle (!!!) the boxes on the score sheet to correspond to your listening experience. Please refer to and correlate to your seating position (drivers seat / passengers seat / center position)

### 360° Movement

While the sound events are floating around and above you, find out if this is seamless, if there are unexpected gaps in the sound reproduction or if the sound originates in an unexpected location (the optical indicators in the clip will give guidance). Score accordingly.

0	homogeneous, seamless
-1	minor gaps
-2	significant gaps/ wrong position
-3	no sound

### Room Quality front stage

Use the center of the screen to define your vertical / horizontal and planar reference and compare as described in detail on the score sheet. Circle the appropriate box on the score sheet. It is clear that a very small screen might have bigger impact in (vertical) height deviation than a bigger one while the horizontal is referencing to the width of the interior!

Furthermore, pay attention to the optical indicators in the clip and compare if they are in synchronization with the acoustical events. Circle the appropriate box on the score sheet in the column lip sync (though it is not the lips syncing to a spoken word, the term is used to align picture/sound). Another information for lip sync is the clip "swordsmith", the sound of the hammer should match the picture. Since "dolby atmosphere" is 24p and "swordsmith" is 60p, it could be that one clip is (more) off/creates lip sync issues. In this case, correct your initial score and note on the right side of the score sheet.



To get an impression of the sound reproduction capability of the system being judged, we use the movie-like-clips “dolby audiosphere”, “dolby amaze” and “dolby horizon” that contain information in various positions (including LFE) and learn how well the mapping into the vehicle environment is performed. We will evaluate:

### **Room Quality Sub bass**

First of all, we determine if there is sub bass at all.

After this, we circle the appropriate box on the score sheet if the sub bass experience was tactile (did we feel it besides hearing? Did we get a thump in our breast or some “rumbling” in our stomach?)

It is still the target that the sub bass is not to be localized, circle the appropriate box on the score sheet.

Finally, we judge how well the sub bass blends with the rest of the system – the scoresheet is offering the possibilities – circle the appropriate, please.

### **Multimedia experience**

In the above mentioned clips, we should sit in a “bubble”, a hemisphere of sound should envelop us. We could be “only” surrounded by the sound, more or less on one horizontal level, or it could be that we have very little envelopment as most is coming from the front – or no envelopment at all. Please circle the box on the scoresheet according to your experience.

In the next section, we evaluate, if there is a realistic feeling of space and distance or if the experience is very narrow (only a few centimetres).

The following section let you evaluate the immersion the system you experience – a good setup / system let you forget the reality around - it should not be a correlation of the car you are physically sitting in nor as if you would wear head phones and everything is in your / close to your head’s perimeter. The least result to achieve would be the feeling of a frontal presentation.

In addition, we pay attention to potential optical (distracting light effects , to small screen not showing the details...) or acoustical distractions (rattling panels, distracting noise...) that pull us out of the movie(clips) and score accordingly on the score sheet. Please make notes in case you experience such to give the competitor the opportunity to work on it and improve.

## **Picture Quality – contrast and brightes & colour, technical track**

Play the clip “test picture” that will be used as a technical track. Check the brightness (with the dark scene), the contrast (with the bright scene) and the colour and score as indicated on the scores sheet.

The clips “swordsmith”, “food fizzle”, “New York fashion week” and “Mont Blanc” will be used for the further evaluation of picture quality as well as for sound quality.

## **In Picture Quality – Details & Resolution, contrast and brightness & colour**

“swordsmith”

The glowing iron and the spark should be natural – in the dark background a lot of details and some movement should be able to be seen. Good indicator for in picture contrast, black level and shadow details as.

“New York fashion week”

A lot of details in the dresses, natural skin tones and vivid, vibrant colours. Pay special attention to motion blurr and artefacts.

“food fizzle”

A lot of sharp and crisp details, even in motion, clear object contours as well as natural colours – pay attention to the saturation as well as if they are vivid and vibrant.

“Mont Blanc”

A lot of details in the white and the sundown with beautiful reflections gives a good possibility to check for artefacts, picture noise, object and detailed contours and motion blurr. Sundown should not be oversaturated.

## **Tonal accuracy and spectral balance**

The sound in the following clips is D2.0, no envelopment is to be expected nor will it be judged now.

“swordsmith”

As previously indicated, this track can be used for lip sync. At the beginning, you can hear the blower and a sound like broken pieces of glass, detailed – the hammer should sound realistic - good Indicator to dynamics. To the end, some artificial room is created. The sound when the sword is inked should sound natural. The music at the end is present but not anyoing.

“New York fashion week”

Nice Pop music track with driving bass and drum set, nicely mixed – should not get annoying. Sounds rich, full a pleasure to enjoy. Not really a lot of internal dynamic (ca. 4-6dB).

“food fizzle”

Nice “Jazz” track with piano, bass, wind instruments and a drum set – should sound natural and is giving a good impression of the entire audio spectrum and good internal dynamic (ca. 20dB). The drum set at the beginning should sound natural, full and dynamic. The wind instruments blend in, trombone first, then trumpets and the rest – also natural, with details and never annoying. The bass is driving, clean and presents a lot of details especially in the solo. While the piano is carrying as a fundamental layer to the bass-solo / end of track.

“Mont Blanc”

Rock music track with some distorted guitars and a well blend in drum set and bass. Not much internal dynamic (6dB). Bass drum sounds fat (Metalica-style). The mix is nice but more towards “pleasant”. Should never get anyoing.

The following sub-sections will be evaluated

- Dynamics (attack, bass precision, punch, powerful)
- Bass (bass strength, bass depth, boomy, boxy)
- Midrange (midrange strength, nasal, canny)
- High Frequency (treble strength, brilliance, tinny)
- Timbre balance at normal volume (neutral, full, homogenous)
- Timbre balance at high volume (neutral, full, homogenous)

Raise the volume of the track, proposal is “food fizzle”, by approx. 10 dB and relisten to it.

- Transparency (clarity, presence, clean, detailed, natural)

The target should be to perform the judging in about 20-30 minutes.

### **LAST BUT NOT LEAST EXPLANATIONS TO THE COMPETITORS**

The competitor will always receive a realistic description of the quality of his/her sound/picture by the judges

Your conversation with the competitor should be done in a very kind & polite way. Please choose your words in such a way that are not offensive for the competitor or his equipment. The Judges should explain in a simple & fast way, the points that you gave for his system.

Your explanations should be done in a way that the competitor is able to understand the meaning. The competitor may not know what a phase difference is and how many points deductions that causes. Never use brand names or installer's names while explaining.

But you can recommend them to listen to another car. Never tell the competitor that the system sounds very good without scoring accordingly. Sounds very good = for the competitor means close to the top.

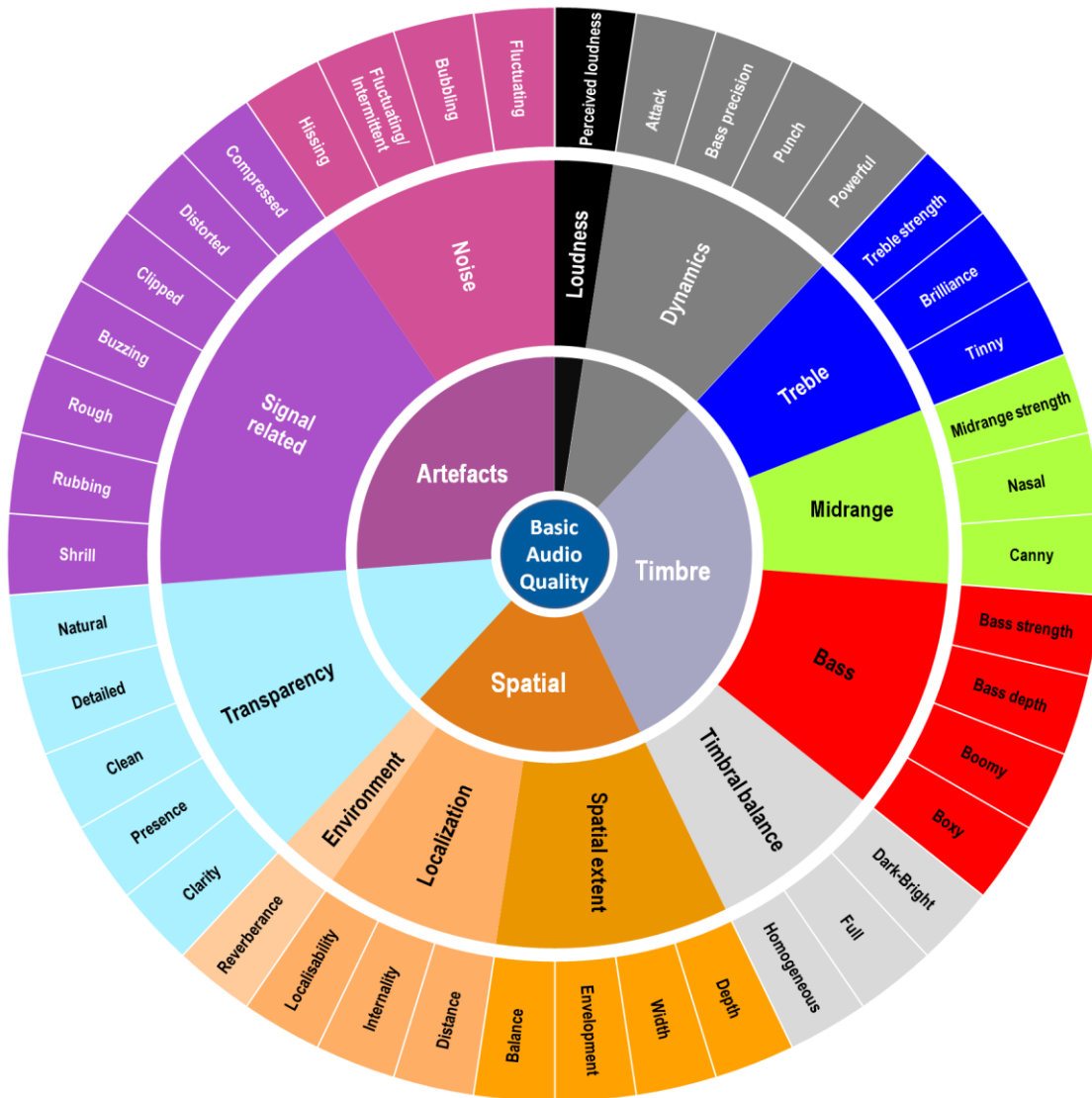
So please choose your words very carefully!



Thoughts about Music Reproduction

Reference: ITU-R Report ITU-R BS.2399-0

The complete paper can be found at the following link <https://www.itu.int/pub/R-REP-BS.2399-2017>



Explanations of the terms for the judge to the participant

<b>Attack</b>	Transient response. Specifies whether the drum beats and percussion, etc. are accurate and clear i.e. if you can hear the actual strokes from drumstick, the plucking of the strings etc. it is also expressed as the ability to reproduce each audio source transients cleanly and separated from the rest of the sound image. Imprecise Attack is understood as unclear or a muted impact. Scale: Imprecise – Precise
<b>Bass Precision</b>	Are instrument impacts from the bass drum and bass precise, crisp and without distortion, are the impacts tight and well defined? Bass precision may be defined as Attack in the bass region. Imprecise means that the attack speeds in time and the peak of the impact is softened. Scale: Imprecise – Precise
<b>Punch</b>	Specifies whether the strokes on drums and bass are reproduced with clout, almost as if you can feel the blow. The ability to effortlessly handle large volume excursions without compression (compression is heard as level variations that are smaller than one would expect from the perceived original sound). Scale: A little – A lot
<b>Powerful</b>	The ability to handle high sound levels, especially when striking the drums and bass. Indicates whether the Punch, Attack and Bass precision are maintained at high volume. Scale: A little – A lot
<b>Localisability</b>	<p>The degree of precision to which the position and extent of a source or ensemble can be identified. This attribute is typically associated with sources or ensembles, rather than scenes. For a spatially imprecise sound the listener may be unable to identify the position (and extend) of the source or ensemble For a spatially precise sound, the listener can confidently state the position and extend of the source or ensemble.</p> <p>Scale: Imprecise – Precise</p> <p>A clap in a dry environment may be spatially precise. Listening to rain fall in a forest maybe spatially imprecise.</p>
<b>Clarity</b>	<p>The impression of how clearly different elements in a scene can be spatially distinguished from each other.</p> <p>Scale: Unclear-clear</p> <p>A singer and a piano performing a duet in a dry acoustic, may be perceived as clear. When listening to a choir from the rear of the church, the sound of the individual signers maybe unclear.</p>
<b>Presence</b>	Does it sound as if the sound sources are present and not distant or absent? Scale: A little – A lot

<b>Clean</b>	It is easy to listen into the music, which is timbral clear and distinct. Instruments and vocals are reproduced accurately and distinctly. The opposite of clean: dull, muddy. Scale: A little – A lot
<b>Detailed</b>	A well-resolved sound rich in detail. Instruments, voices etc. can easily be separated. The music has many details, details that cannot be measured, details that give the music "soul". It may be small audible nuances: Breathing from a singer, fingers wandering across the guitar strings, the flaps from the clarinet, embouchure sound of the saxophone, the impact from the piano's hammers when they hit the strings. Scale: A little – A lot
<b>Natural</b>	Sounds reproduced with high fidelity. Acoustic instruments, voices and sounds, sounds like in reality. The sound is similar to the listener's expectation to the original sound without any timbral or spatial coloration or distortion, "Nothing added – nothing missing." The soundstage is clear in space and brings you close to the perceived original sound experience. Scale: A little – A lot
<b>Shrill</b>	Treble Distortion. Very sharp s-sounds, cymbals etc. Scale: A little – A lot
<b>Rubbing</b>	As the sound of something scraping on a (rough) surface. Scale: A little – A lot
<b>Rough</b>	A hoarse off-sound unintentionally accompanying the reproduced sound. Bass distortion. Scale: A little – A lot
<b>Buzzing</b>	A zzz-like, undesirable sound typically in the low and midrange frequencies. Scale: A little – A lot
<b>Clipped</b>	The harmonics are too pronounced and sharp. Scale: A little – A lot
<b>Distorted</b>	Additional and undesired sounds that add a sharpness to the reproduction. Scale: A little – A lot
<b>Compressed</b>	Limited dynamic range leading to a lack of natural peaks. Dynamic compression may be heard as a pumping effect. Scale: A little – A lot



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