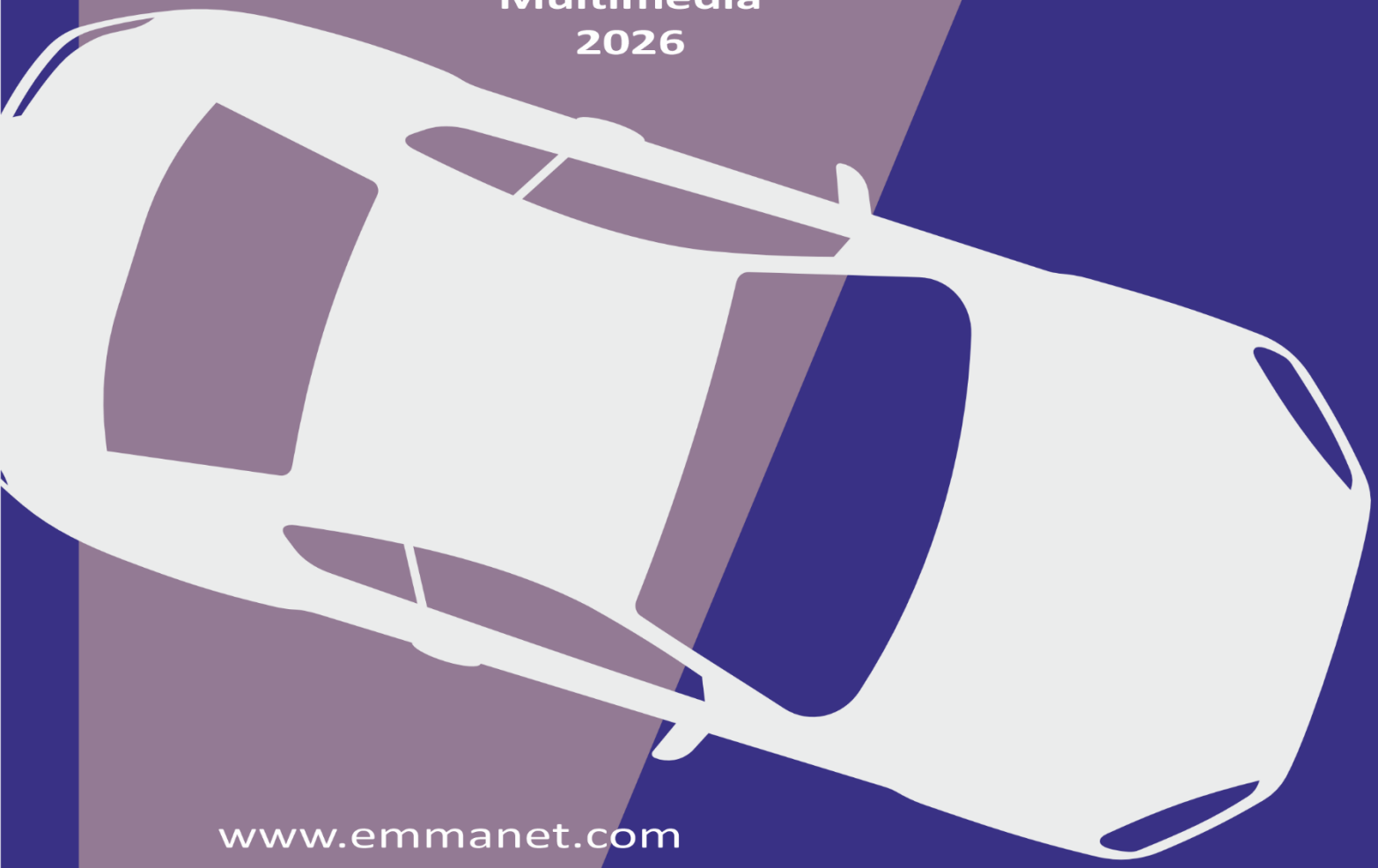
EMMA
european mobile media association

European Mobile Media Association

Judgebook Multimedia 2026



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Welcome to the European Mobile Media Association

5. Preface

This manual is designed to describe the exact Pprocedure, 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.

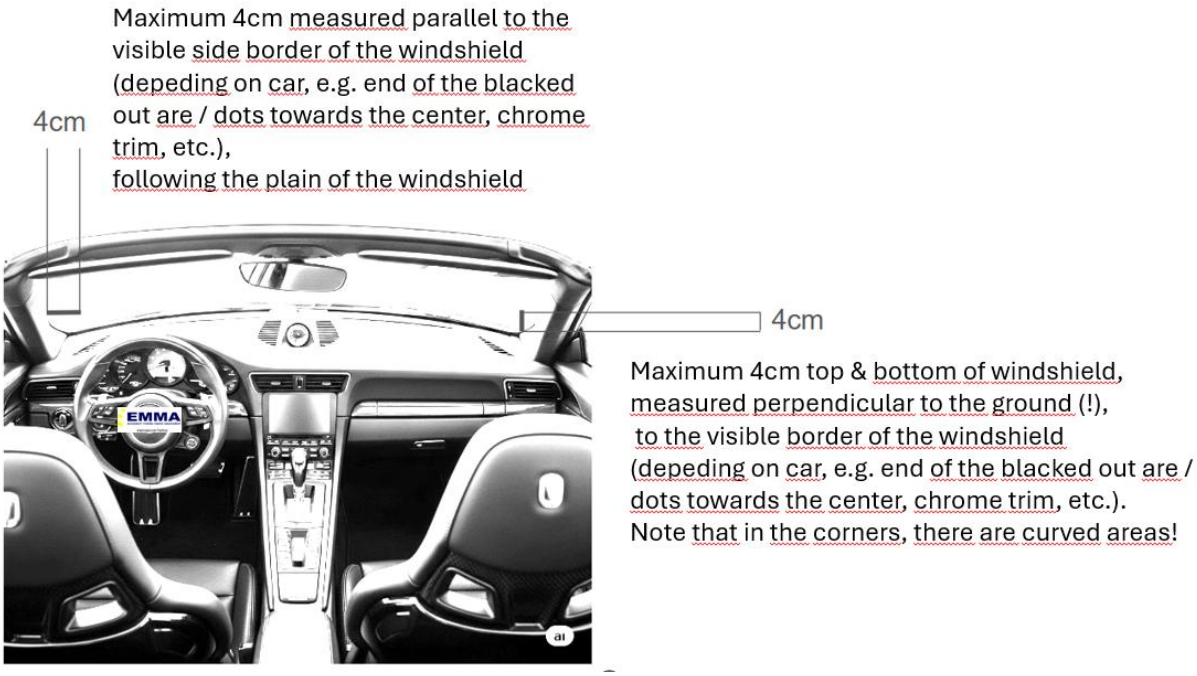
How to score:

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

- **Limited view**

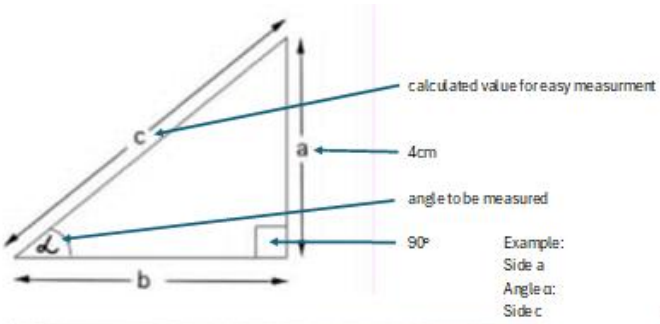
The Judge will check for restricted view through the windshield and the two front side windows due to installations on dash / pillars / doors. The Judge will sit in the designated driving position and check if anything of the audio systems Installation is interfering the view. If the installation is restricting the view to the road/sides (not to the car itself) more than EMMA is tolerating, or If in doubt, a measurent will be done following the procedure as described in chapter “Sound Quality” under “limited view”
Note:
Triangular windows within the A-Pillar/ front doors will not be considered if the view through these windows is not blocked by elements of the installation not higher and/or longer than half the height and length of the side window.
The views to the side mirrors should not be blocked (if no passenger side mirror installed, the rear-view mirror must allow a full view back).

If the view/use is restricted, the Judge deducts 3 Points per situation.
Maximum deduction 6 Points.



To simplify the measurement on top or bottom of the windshield, a trigonometric function (tangent) can be applied:

- Use measurement tool of smartphone
- determine angle of windscreen in the relevant area
- use the value from the following table and mark the maximum allowed distance
- sit in reasonable driving / listening position and check if you can see the mark
- if yes, ok – if no points need to be adjusted



More examples

Angle a in degrees	measurement c in cm
25	9,46
26	9,12
27	8,81
28	8,52
29	8,25
30	8,00
31	7,77
32	7,55
33	7,34
34	7,15
35	6,97
36	6,81
37	6,65
38	6,50
39	6,36
40	6,22
41	6,10
42	5,98
43	5,87
44	5,76
45	5,66
46	5,56
47	5,47
48	5,38
49	5,30
50	5,22
51	5,15
52	5,08
53	5,01
54	4,94
55	4,88

- 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:

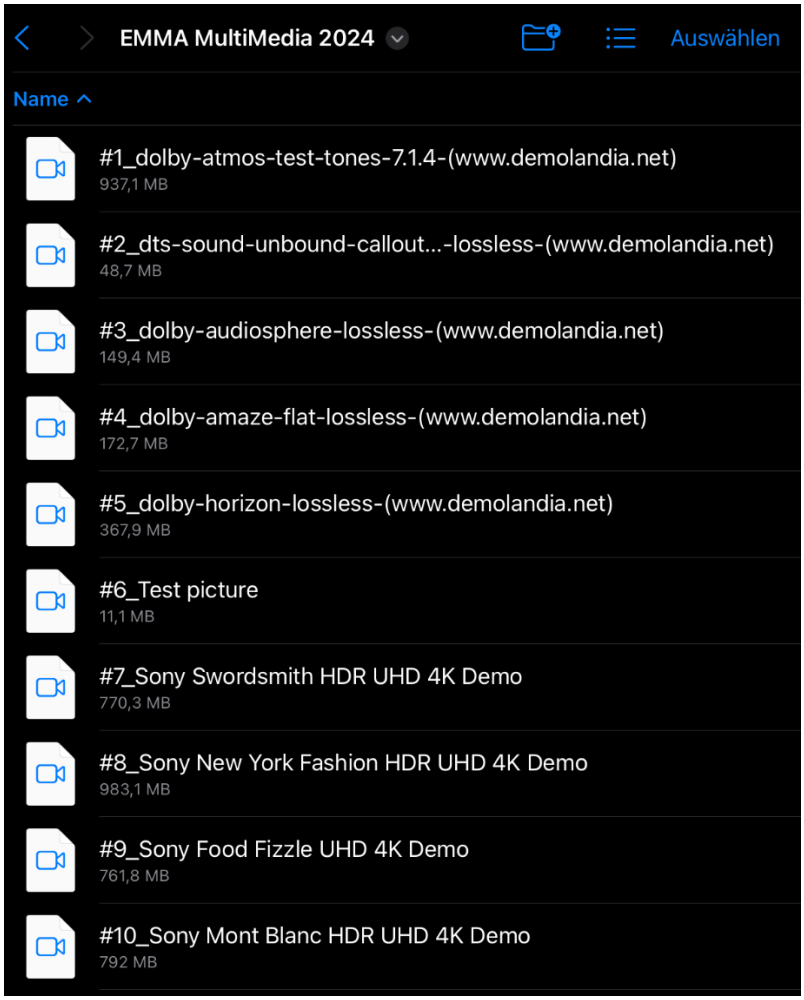
- 4 cm perpendicular height taken 90 degrees to the road surface, when checking from the bottom of the screen or the side windows.
- When measuring on the windscreen the measurements are always taken from the edge of any opaque areas which are part of the screen. IE the LAST, smallest black dot
- 4 cm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

Front Left (Reference)			
0	correct position		
-1	minor deviation	Position	minor deviation (+/- ca. 10cm)
-2	medium deviation		medium deviation (+/- ca. 20cm)
-3	big deviation		big deviation (more then +/- 20cm or wrong position)

The sound is either well focused or deviates as described.

0	sound is well focused
-1	noticably diffuse
-2	significantly diffuse
-3	no focus at all

Focus:	noticably diffuse = still arround the postion of origin
	significantly diffuse => in between two ore more surrouning postions
	no focus at all => not able to detect the point of origin / wrong position / no soun

System 360° + Atmos Level

Reference (spl) level is given by the Front Left postion. Ideally, the level will remain consitant at all speakers played. (ignore sub integration since judged later).

In case Front Left is not giving any sound, the Front Right will be used instead.

0	same level as reference
-1	minor deviation in level
-2	significant deviation
-3	no sound

Depending on your experience, play the clips "dolby atmos test tones 7.1.4" and/or "dts-Sound-unbound-callout-11.1-lossless" again or evaluate during your first round.

(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)

Even if the system is not up to the 7.1.4 specification, we judge the car according to our actual listening experience.

Room quality - Surround

We judge, if the speakers on the so called “bed layer” LCR, Surrounds, Surround Backs remain on the same horizont or deviate in “stage height” relative to the previous postion.

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

Voice/Timbre maching

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

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

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, seemless
-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 with 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 envolopment 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)
- Timbral balance at normal volume (neutral, full, homogenous)
- Timbral balance at high volume (neutral, full, homogenous)

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

(hint to set the volume: use the noise from the left front position of track “dolby-atmos-test-tones…” to adjust to approx. 75dB/C at approx. your left ear (normal volume and raise the volume by 20dB (if possible – avoid overdriving the equipment, for high volume)

- 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.

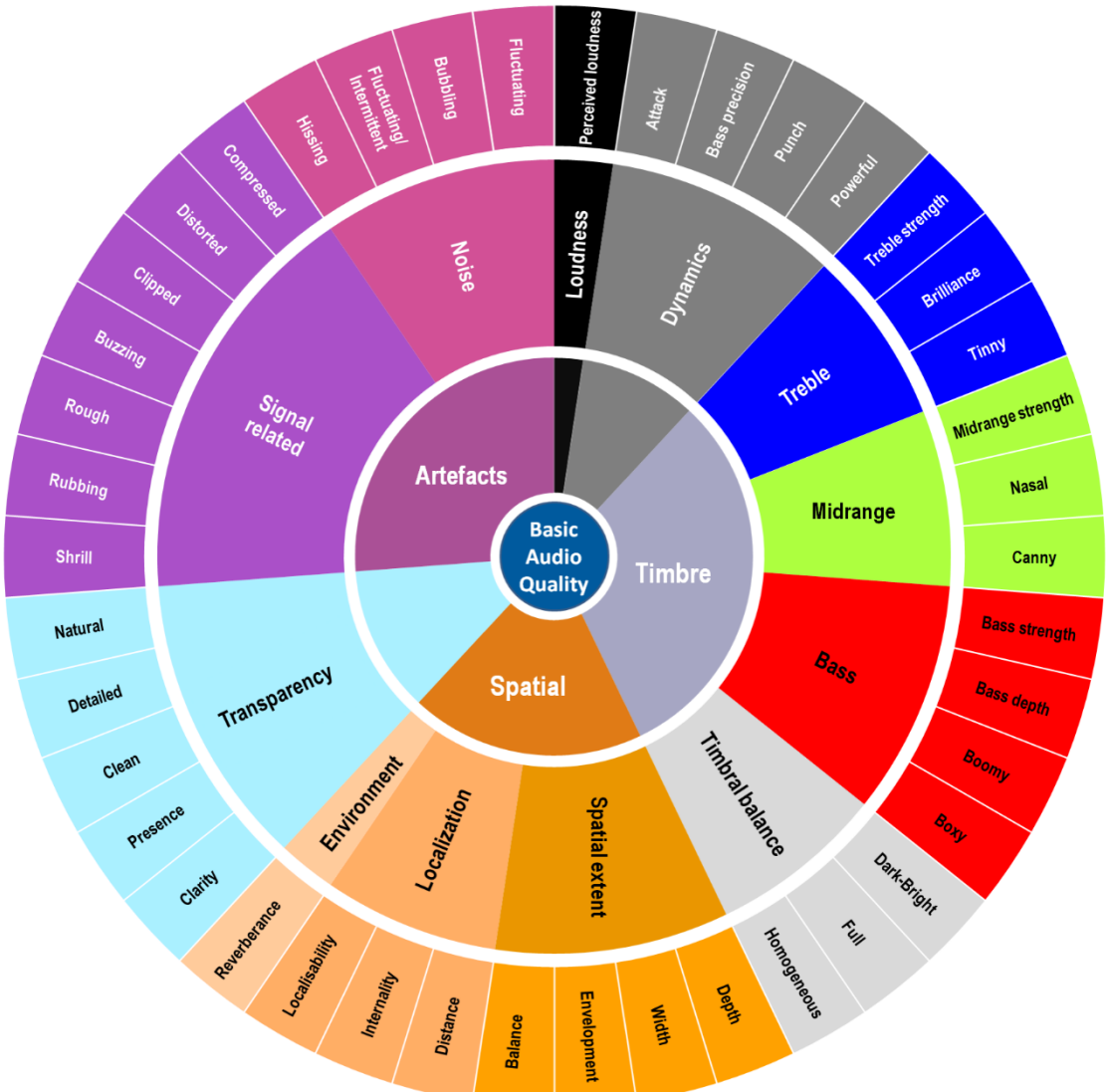
But you can recommend them to listen to another car. Never tell the competitor that the system sounds very good without scoring accordingly. Sounds very good = for the competitor means close to the top.

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



Attack	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
Bass Precision	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
Punch	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
Powerful	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
Localisability	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. Scale: Imprecise – Precise A clap in a dry environment may be spatially precise. Listening to rain fall in a forest maybe spatially imprecise.
Clarity	The impression of how clearly different elements in a scene can be spatially distinguished from each other. Scale: Unclear-clear 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.
Presence	Does it sound as if the sound sources are present and not distant or absent? Scale: A little – A lot

Clean	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
Detailed	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
Natural	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

Explanations of the terms for the judge to the participant

Shrill	Treble Distortion. Very sharp s-sounds, cymbals etc. Scale: A little – A lot
Rubbing	As the sound of something scraping on a (rough) surface. Scale: A little – A lot
Rough	A hoarse off-sound unintentionally accompanying the reproduced sound. Bass distortion. Scale: A little – A lot
Buzzing	A zzz-like, undesirable sound typically in the low and midrange frequencies. Scale: A little – A lot
Clipped	The harmonics are to pronounced and sharp. Scale: A little – A lot
Distorted	Additional and undesired sounds that add a sharpness to the reproduction. Scale: A little – A lot
Compressed	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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