MultiMedia Judgebook
2016

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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.

Pre Judging Check

- Grills front **(only M-class)** are the speakers protected with grills
- Left/Right Channel is the sound coming from the right positions?
Hint:
- We don't have a dedicated track but Judges use the track "5 positions"

5.1.1 Dolby Digital 5.1 on Stereo systems (2.1)
The official DVD software is encoded in Dolby Digital 5.1. In classes where the judging is done based on a stereo system (no center, no surround speakers), the competitor must ensure, that the DD 5.1 Signal is down sampled to 2.0. Just switching of the rear system may not be enough because information in the surround channel might be missing. The usage of a center speaker is forbidden in such category.

Hint:
- Please check if there are grills in the back and in the centre position.

5.1.2 Checking charger connected y/n
Ask the competitor to disconnect the battery charger (if any) from his/her system and document it into the check box on the score sheet.

Hint:
- Important to consider that all equipment can be powered by the car.
- physically disconnected

5.2. Sound Stage and Room Quality

5.2.1 360° Level (only M-class and X-class)
360° level refers to how well the system performs regarding the sound level around the listener. When sound sweeps around the listener, the level should not vary as the sound moves. (E.g. when a car is passing by from left to right, or when a train comes from the rear to the front, the level should not change)

Hint:
- Take the track "five positions"
  the sound should have the same level at each section
- You can also use the track "Pink noise"
  the sound should also have the same level at each section, but here the sound is moving around you for some judges it may be easier to listen to a moving sound.

How to score:
20 – 25 points   No level changes
15 – 19 points   Slight level inaccuracy
10 – 14 points   Clear level inaccuracy
5 – 9 points   Several inaccuracies
0 – 4 points   Total failure

5.2.2 360° Movement (only M-class and X-class)

360° movement refers to how well the system reproduces the sound positions all around the listener. When sound sweeps around the listener, the movement/panning should be smooth and seamless as the sound moves. (E.g. when an UFO is passing by from left to right, or when a train comes from the rear to the front, the movement of the sound should be smooth and realistic.)

Hint:
- Use the track "Pink noise"
- You can also use the "Motion picture"
  the section when the plane is flying from front above you, turning in the back, and leaving to the front again. Then the plane is flying from the far right to the far left. (In some cars the plane stops at the center and then jumps from the center to the left.)
  Also when the train in minute 3:47 is coming from the right front to the right surround

How to score:
20 – 25 points   Seamless movement
15 – 19 points   Minor gaps
10 – 14 points   Big gaps
5 – 9 points   Jumping speaker to speaker
0 – 4 points   No movement (mono-like)

5.2.3 Room quality – Sub bass

Consider the sub-bass ability to "fill up" the room. The sub should be audible and felt in the whole listening room, but not easily localized. It's quite different to SQ, where the sub idealistic should be positioned only in front of the listening position.
The LFE (Low Frequency Enhancement) integration should also be considered. LFE is a very important part of a Multimedia system. Consider the crossover points from the sub/LFE with regard to the rest of the system (usually around 50 - 100 Hz); there should be no peak or distinct change in level.

High points when sub is clearly audible and felt, but cannot be localized.

Hint:
- Use the track "LFE test"
  - first it should sound like someone steps on the floor above you
  - then there should be a big stone moved from the left front to right – around you to the left surround
  - at last there is an explosion (this explosion should sound like an explosion and not like firecracker

How to score:
10 points   Excellent integration of sub/LFE
7 – 9 points   Close to excellent (no big faults)
4 – 6 points   One obvious fault (boomy bass /easy to localize /audible dips or peaks etc.)
1 – 3 points   Several faults, your false teeth rattle out
0 points   No sub/LFE

5.2.4 Room quality – Front stage

The soundstage relative to the screen and picture is judged here. High points can be earned for a system that has the front stage is aligned with the picture showed on the screen, both horizontal, vertical and in depth.

Points are deducted if e.g.

- The screen is located low in center console and the sound is above dashboard.
- If the center sound and the screen is not aligned vertically. (The center is reproduced to the side from the screen)
- If the sound and screen doesn't align in depth (e.g. sitting in backseat with screen in headrest and sound at the dashboard)
- If the front stage height is not stable.
- Narrow front stage (distance from left to right position, compare to width for SQ)
- Bad lip-sync (sound and picture not in phase)

Note

The width of the front stage does not apply the size of the screen. A small screen is no excuse for a narrow front stage.
The quality of the picture is not judged under this paragraph

Hint:

- For this section you can use everything what happens in front of you.

How to score:

10 points   Excellent front stage
7 – 9 points   Close to excellent (no big faults)
4 – 6 points   Only one obvious fault (picture not aligned, unstable soundstage, bad lip-sync etc.)
1 – 3 points   Several faults
0 points   No front stage (only sound from behind)

5.2.5 Room quality – Surround (only M-class and X-class)

The system's ability to reproduce the surround information is important for good room quality. High points can be earned for a system that reproduces a feeling of a big "room" behind the listener. Also consider the distance to the "surround soundstage" (should not be separated from the front stage).

Hint:

- Use everything what happens in the surround.
  such as the jack-hammer at minute 2:24 in the motion pictures or the starting engine in minute 4:18

How to score:

10 points   Excellent Surround experience
7 – 9 points   Close to excellent (no big faults)
4 – 6 points   Indistinct Surround feeling/Surround clearly separated from front stage
1 – 3 points   Hard to verify if there is any Surround
0 points   No Surround (only sound from front)

5.2.6 System separation

This could roughly be compared to the imaging characteristics for SQ judging. The information showed on the screen should be clearly defined by the sound system. Look for correct focus and separation between the sound positions. Also consider the left and right separation in the surround.

Note:

It's most important that the front stage separation is clearly defined; a slight lack of separation in the surround sound is acceptable and will not result in a high point deduction.
In the C-class the point are only from 0 to 17 and only for the front system.

Hint
- Are all the sounds are coming from the same positions like the picture
- Attention!!! Experienced judging plus the 8 possible points for the surround

How to score:

	(only M-class and X-class)
+1 – +8 points	Surround lacking focus/position (add the points to the experienced points)
	(also S-class)
14 – 17 points	Placements clearly defined for the whole system
9 – 13 points	Front stage lacking focus/position
4 – 8 points	Central voice lacking focus/position
0 – 3 points	No separation/mono-like

5.3 Tonal Accuracy and Spectral Balance

A Multimedia system should reproduce a recording as realistic and authentic as possible. If it is a live recording, it should sound just like that, if it is a studio recording, it should sound as close to the intentions of the producer as possible. Therefore, EMMA teaches the Multimedia judges to fully understand exactly how the EMMA Multimedia DVD was recorded and what it should sound like. It is a valuable tool that allows the scoring of the tonal accuracy of the four sections that separate the audible frequency range into

- Sub-bass
- Midbass
- Midrange
- High frequencies

and the overall spectral balance of the entire audible frequency range.

Under tonal accuracy, the judges will specifically concentrate on each range, ignoring the spectral balance of the whole spectrum. Under overall spectral balance, they will evaluate how well the four above sections add together to create a full picture approximating as much as possible the original on the EMMA Multimedia DVD.

5.4.1	**0 – 15**	**Sub-bass**
5.4.1	**0 – 15**	**Midbass**
5.4.1	**0 – 15**	**Midrange**
5.4.1	**0 – 15**	**High frequency**

Listen to the systems tonal accuracy from all positions as one (including Surround) and the ability to reproduce the sound in a realistic way. Please remember the material reproduced from a music- or movie-DVD could be excessive depending on the sound mix. Tonal accuracy for a Multimedia system should not necessarily be compared to a SQ system.

Hint
- Similar reference like a sound quality judging

How to score:
15 points	Excellent
13 – 14 points	Very good sound, close to excellent
10 – 12 points	Good sound, almost no mistakes
7 – 9 points	Average sound
4 – 6 points	Poor sound or big mistakes
1 – 3 points	Unacceptable, harsh sound
0 points	No sound

5.3.1 Spectral balance

5.3.2 Overall spectral balance – normal volume

5.3.3 Overall spectral balance – high volume
Listen for the overall spectral balance and tonal accuracy on normal respectively high listening volume. Spectral balance at low volume will not be judged.

If a Multimedia system cannot play loud (e.g. normal volume = loud volume), 10 points will be deducted

Hint
- Similar reference like a sound quality judging

How to score:
15 points	Excellent
13 – 14 points	Very good balance, almost excellent/realistic
10 – 12 points	Good balance, only small deviations/coloration's
7 – 9 points	Average balance, some deviations/coloration's, e.g. bass quite loud
4 – 6 points	Poor balance parts of the spectral balance are clearly covered by others
1 – 3 points	Unacceptable balance, e.g. hard to detect that there is a reproduction of the entire spectral balance
0 points	No sound

5.3.4 Voice/timbre matching
The voice/timbre matching should not vary depending on the location in the sound system. All the systems sound locations should match; front, center and surround. E.g. a dark male voice at the left moving to the center position should not then sound like a boy.

Note:
It's most important that the front stage matching is good; a slight difference in the surround sound is acceptable and will not result in a high point deduction.
In the S-class the point are only from 0 to 17 and only for the front system.

Hint
- Sounds the explosion like an explosion

How to score:

	(only M-class and X-class)
+1 – +8 points	Surround lacking focus/position (add the points to the experienced points)
	(also S-class)
14 – 17 points	Excellent matching throughout the whole system
9 – 13 points	Poor Surround matching
4 – 8 points	Slight difference front stage
1 – 3 points	Poor front stage matching
0 points	No sound

5.4 Picture Quality & Multimedia Experience
The screen used for judging should be pointed out by the competitor before the judging starts (if multiple screens are installed). During judging only one screen is allowed to be turned on!

5.4.1 Details and resolution
Look for the screens ability to reproduce details and that the resolution makes the picture look realistic. E.g., look especially for small details (a person's hair, snow/rain drops, microbes, details on a wall, etc.) and that you don't see the pixels.

Note:
- A big screen is not always better. The bigger screen demands a higher resolution not to see the pixels.
- No deduction will be made for the wrong aspect ratio (stretched/shrunk picture, e.g. 4:3 on a 16:9 screen). If this is the case, it could be considered under "Multimedia experience".

Hint
- "Motion pictures"
    - watch the leafs in the trees, the sections of the fence and the clouds
    - is it easy to see the windows at the hotels
    - is it possible to see fountains in front of hotel "Bellagio" or is it only a white wall
    - can you see the waterfall in front of hotel "Aria" and also the small fountains in front of the hotel
- "Test pictures"
    - Watch at the white and black numbers (wait 2 seconds at the beginning)
    - The color bars should be clearly separated

How to score:

13 – 15 points	Excellent picture/Looks very realistic
9 – 12 points	Close to excellent (no big faults)
6 – 8 points	Average/one obvious fault
1 – 5 points	below average/several faults
0 points	No picture

5.4.2 Contrast and brightness
Look for the screens ability to reproduce details and information in dark and bright areas. E.g. clouds in the sky, movements in shadows, a car on a dark street etc.

Hint

- Are there extreme bleedings at some sections that you can't separate some sections in the picture

How to score:

13 – 15 points	Excellent picture/Looks very realistic
9 – 12 points	Close to excellent (no big faults)
6 – 8 points	Average/one obvious fault
1 – 5 points	Below average/several faults
0 points	No picture

5.4.3 Color

Look for the screens ability to reproduce colors. The colors should not be dull or lusterless or excessive. Look especially for "bleeding" colors, often seen where the contrast is high.

Hint

- Are the colors normal (is red – red or is blue – blue)

How to score:

13 – 15 points	Excellent picture/Looks very realistic
9 – 12 points	Close to excellent (no big faults)
6 – 8 points	Average/one obvious fault
1 – 5 points	Below average/several faults
0 points	No picture

5.4.4 Multimedia experience

The overall Multimedia experience is judged here; both sound and picture will be considered. This point could be slightly compared to listening pleasure in SQ.

Focus only on the picture and sound presented by the Multimedia system. Don't take installation issues and gadgets, which will enhance the Multimedia feeling (popcorn machine, moving curtains in front of the screen, etc.) into consideration with this point because the installation judges will judge these.

A good Multimedia system should be able to reproduce the Multimedia experience in such a realistic manner and it should make you feel part of the action, just like a good movie theatre does. Keep in to consideration that a lot of movies offer a "larger than life" experience (loud noises, big explosions and bullets flying around your head.)

Points will be awarded for everything that enhances the Multimedia experience. For example:

- Real listening and viewing pleasure
- Good dynamics in the sound
- Real life picture quality
- Convincing LFE sound effects (think of the roar of a dinosaur, the rumbling of an active volcano, a big helicopter flying overhead etc.)

Points will be deducted for anything that makes the experience less enjoyable. For example:

- Bad tonal accuracy and/or spectral balance
- Unrealistic/bad picture quality
- Unrealistic, artificial sounding sound.
- Rattling noises from the car
- Screens which are too small to see enough detail of the movie
- A lack of surround information

Hint
- Can you imagine watching a complete movie in the car?
- Similar reference like listening pleasure

How to score:
21 – 25 points	Excellent
15 – 20 points	Close to excellent
10 – 14 points	Average
5 – 9 points	Below average
1 – 4 points	Absolutely no Multimedia experience
0 points	No sound

5.5 System Handling

A Multimedia system could be very complex with lots of units, but the system should be easy to use and control. Full points will be awarded, if the complete system can be controlled by one control unit. 2 points are deducted for each additional control unit or separate button if required. A control unit could be the source unit itself, but also remote control, power button, keyboard, game pad etc. It should be easy for the judge to operate the system during the judging process and leave no doubt or confusion on how to navigate menus, change volume etc. The handling should be made in a relaxed way from the judging position.

Only the controls needed for judging should be considered:
- Volume +/-
- DVD-menu navigation
- Power on/off (including all units used during judging; source unit, amps, screen etc.)

Note:
- If all controls are available on the source unit itself 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 volume and menu navigation but the power button is a separate button under the screen.
- The remote control unit doesn't necessarily have to be mounted fixed.
- The deduction well be in steps, <u>not only</u> one (1) point for each section

How to score
6 points	Whole system controlled from one (1) control unit.
4 points	Two control units (e.g. one for screen, one for source unit)
2 points	Three control units (e.g. one for screen, one for source unit, one for DVD-player)
1 point	Four or more control units (lowest score if it's possible to operate the system)
0 points	Impossible to operate the system

Example:
One remote control for source unit but screen needs to be turned off by a separate button → 4 points

If everything can be turned off by the car-key, there are no deductions.

5.6   Adjustments

5.6.1 Engine-off testing - switching noise
Potential noises can be:
Turn-on/turn-off noise, switching pops -- a popping, thumping or clicking noise that is heard through the system's speakers when the system is powered up by the source unit's on/off switch or switching pops - a clicking or popping noise that comes through the speakers when adjustments are made to the audio system's volume or track selection controls. Digital search, or stepper noises, which are inherent in some digital volume control designs, are beyond the scope of being corrected by proper installation techniques, but are not considered acceptable and will result in point deduction.

How to score (deduction):
0 points   No audible noise
-1 to -2 points   Barely audible noise
-3 to -4 points   Plainly audible noise
-5 to -6 points   Potentially damaging noise

5.6.2 Engine-off testing - System noise
A noise that is somehow emulated from or by the audio system, the vehicle or the vehicle environment and that is not recorded on the competition DVD.
Any track except the technical tracks can be used.

Potential noises can be:
Rush, hum, hiss, cracks, floor noise, rattling panels, loud fans, mechanical noise, etc.

Note

- Points are not to be deducted for mechanical noises such as relay clicks or automatic motorised covers being activated

How to score (deduction):
0 points   No audible noise
-1 to -2 points   Barely audible noise
-3 to -4 points   Plainly audible noise
-5 to -6 points   Potentially damaging noise

5.6.2 Engine-on testing
Noise that is generated by the mechanical or electrical system of the vehicle that is reproduced through the speakers with the audio system turned on or off. Any track except the technical tracks can be used. The judges will adjust the volume level from medium to maximum. If the noise increases the judges may deduct maximum 6 points.

Possible noises are:
Alternator whine, ignition noise, PWM-noise created by control boxes, etc.

How to score (deduction):
0 points   No audible noise
-1 to -2 points   Barely audible noise
-3 to -4 points   Plainly audible noise
-5 to -6 points   Potentially damaging noise

Note

- The competitor can request that the system should be switched off before starting the car.
- If the engine won't start (due to drained battery), the competitor will be offered the chance to jump-start their vehicle within 3 minutes, 3 points will be deducted. If the car cannot be jump-started within those 3 minutes, the maximum deduction of 6 points will be made.
- The judges must carefully determine whether the noise is actually coming from the system itself. Many engines produce whining sounds from various different mechanical actions (turbochargers, alternators spinning etc.). To do this the judges can move their heads closer to the speaker in the vehicle (not to judge the audibility of the noise, but only to establish its origin). If the judges are not sure about the audibility of alternator whine, they should not deduct any points.
- Whenever a vehicles running engine is so loud that noise can't be checked, the maximum amount of points for 'noise with running engine' will be deducted

5.6.3 Picture noise

Look at the screen for noise, flickering, jamming etc. especially while the engine is running. Look also for More-patterns in the static test picture

Hint

- Are the some visible noises in the picture (deduct minimum 1 point per noise)

How to score (deduction):

0 points	No noise
-1 to -2 points	Barely visible noise, More patterns
3 to -4 points	Clearly visible noise
-5 to -6 points	Picture is totally jammed

Note:

No deduction will be made for the wrong aspect ratio (stretched or shrunken picture e.g. 4:3 on a 16:9 screen).

Multimedia judging guide

This document is a guideline how to judge multimedia category in EMMA. The judging is done with the official EMMA multimedia DVD, produced and supplied by EMMA. The DVD has been produced in the Cap á Pie studios, the same studio that produce the sound quality CD.
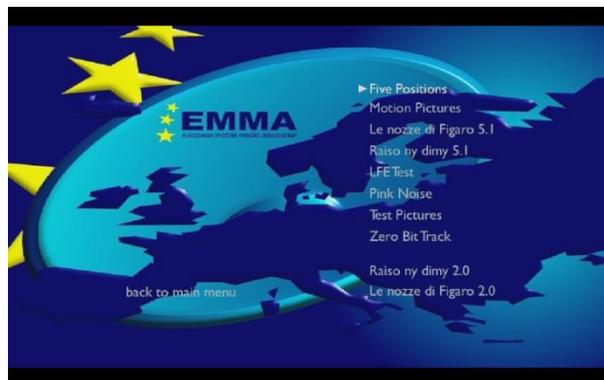
Disc navigation

Main menu

Adjust the volume level slightly higher than the speakers voice (normal conversation level). The volume needs to be set a few steps higher than the speakers voice for easier judging.

Track listing

1. Five positions
2. Motion picture
3. Music track - Le nozze di Figaro
4. Music track - Raison y dimy
5. LFE test
6. Speaker test - Pink noise
7. Test pictures
8. Zero bit track
9. Music track - Raison y dimy (DD 2.0)
10. Music track - Le nozze di Figaro (DD 2.0)

All tracks are recorded in Dolby Digital 5.1, except tracks 9 & 10 to be used for judging Multimedia Experienced category. Please note for Experienced category; the judges are allowed to use the motion picture track as well as the technical tracks even though not available in 2.0. EMMA expect the competitor to setup the equipment the best way for these conditions (e.g. downmix 5.1 to 2.0).

Notes

- For judging category Master & Expert, select "Start" from the main menu and jump between the track by using forward/reverse.
- For judging category Experienced select "Scenes and Bonus" and choose 2.0-tracks from the menu. Please note, when you select the tracks from this menu you can't skip track by using forward/reverse, so you must return to menu and select track.

Track explanations

1. Five positions

The speaker repeats "Test sequence close - far - extreme far" in the five positions. Defines the sound positions and focus, as well as the depth of the soundstage.

2. Motion picture

Listen to the systems tonal accuracy on a video from Las Vegas with 5.1 sound effects. Here are a few hints what to listen for:

Time	Description
1:12	Follow the plane movements
2:10	Crowd is moving surround center to surround left
2:24	Jackhammer surround left
2:42	Powerful music
3:16	Police siren in background of traffic noise
	(making a 360 turn, starting in surround right)
3:31	Feel the presence being inside the casino enviroment
3:43	Starting car, left to right
3:47	Train center-right to surround right
3:55	Car driving by from center to surround center-right
4:05	Cars from center to right
4:18	Engine start surround left
4:28	Taxi breaking right to left
4:31	Church bell surround center-left
4:38	Plane from surround right to center

3. Music track, Wolfgang Amadeus Mozart - Le nozze di Figaro

Listen to the systems tonal accuracy with music recorded in 5.1. The recording was made by WDR (German TV). Feel the precense in the recording made in an opera hall.

4. Music track, Madagaskar Allstars - Raison y dimy

Listen to the systems tonal accuracy with music recorded in 5.1. The recording was made by WDR (German TV). The track plays some nice surround effects with one of the singers in the surround channels. Listen for the focus and position of each singer.

5. LFE test track

Judge the LFE integration on the sound effects. You can also find some nice surround effects.
- Footsteps on ceiling
- Dragged stone
- Explosion

6. Speaker test - Pink noise

Full range 5.1 pink noise. First played one channel at the time, then making a 360 turn and ending with all channels at the same time.

7. Test pictures
Judge the screen performance by the test pictures.
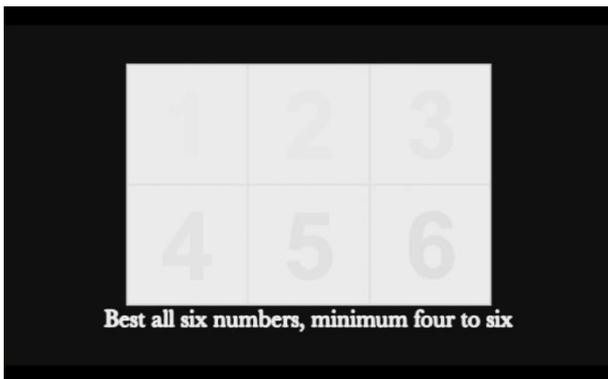
|	
Contrast, bright	On a perfectly tweaked screen you should see all six numbers. The box should be in true white, the background in true black.
Contrast, dark	On a perfectly tweaked screen you should see all six numbers.
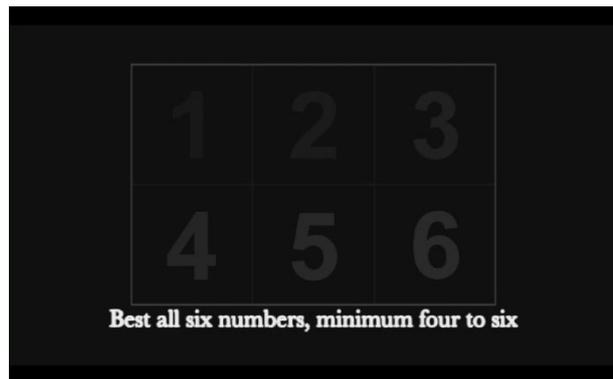
Hint: Check the details and resolution by the text line under the picture.
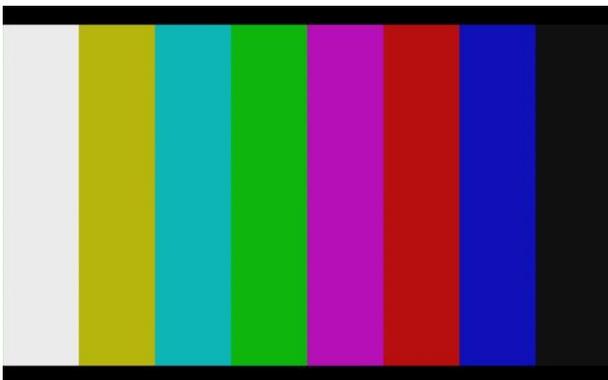
Color bars	Look for color reproduction, bleeding colors etc. Clear vertical lines should be seen.

Hint: It's also a good idea to check the details, resolution and color by the track intro where you see the EMMA logo (yellow stars on black background, the text under EMMA, the red text explaining what track, etc). Since the test picture intro is rather short, you can use the following track Zero bit for this.

8. Zero bit track
Use this track to check system noise.

9. Music track - Raison y dimy (DD 2.0)
Same as track 4, but recorded in DD 2.0 (downmix from 5.1).

10. Music track - Le nozze di Figaro (DD 2.0)
Same as track 3, but recorded in DD 2.0 (downmix from 5.1).

Notice:

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ALPHARD
SOUND TECHNOLOGY

Auto Q Damping
QD An-Bo-Shi

GERMAN CAR AUDIO
BRAX

CRESCENDO
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DLS

ESX
The Car Audio Forge.

FOCAL
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MOSCONI

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GERMAN ENGINEERING

HARMOTECH
TRUE AUDIOPHILE

HELIX
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HIFONICS
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VENOM

VIBE
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