



## **Official Competition Manual 2022**

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Sound Quality   Multi Media   ESQI   ESPL   EMMA tuning

**20** YEARS ANNIVERSARY

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## 1. Welcome

### History & preface

Car Audio Competition has its roots in the United States, where the first organisations designed competition manuals for Sound Quality events. EMMA was founded to create a level playing field for sound quality competitions in Europe and to unify the different rulebooks that were used all over the continent.

EMMA International is the leading organisation for the EMMA national car audio associations all over the world and is responsible for the annually organised international Head Judge Training, the standardised rulebook and the media used for CarMedia competition.

Its website [www.emmanet.com](http://www.emmanet.com) gives access to important information about the sound quality competitions.

In addition to Sound Quality, the EMMA competition series also includes EMMA Multimedia (MM), EMMA Sound Pressure League (ESPL), EMMA Sound Quality League (ESQL) and EMMA Tuning, catering for all forms of car audio systems.

In this version of the EMMA rulebook, all our experiences gathered over the last 20 years from all National Organisations and the international Competitions have been used to create a rulebook that is fairer and easier for the competitor to understand and follow.

It is also EMMA's sincerest hope that these rules will be recognized as an example of the organisations continuing efforts to promote the CarMedia industry.

### EMMA Mission Statement

The mission of the European Mobile Media Association is to provide guidelines for an independent group of national car audio organisations all over the world. It sets rules and regulations by which the Sound Quality, ESPL, ESQL, Multimedia and EMMA Tuning competitions are held. EMMA's goal is to encourage fair competitions on an equal level throughout all member countries and to promote the growth of these events. The intention is to have an international Championship in the available formats every year.

Furthermore, EMMA encourages both, competitors and installers, to extend their knowledge of the equipment they are using. This then results in a higher standard of quality for the installations and ensures the equipment will perform to its optimum. Ultimately this will result in satisfied competitors and/or customers.

### The Competition Challenge

For EMMA's competitors, the challenge is to build an Audio or Multimedia system that will overcome the problems of the vehicle acoustics, reproducing music without noise or distortion and to make the music sound like the "original" and / or a high Sound Pressure Level. Installation quality is also evaluated.

### The Competitive Spirit

EMMA was established to satisfy the need of competitors to find out "Who is on top in Europe, Asia, Africa, Australia, America or the world".

Today's high performance car audio equipment is capable of delivering sound reproduction so accurately and loud, that it does not sound like reproduction at all. EMMA is concerned that some

people may forget that the most important instruments in this listening experience, their ears, have limits. The last thing we want to see is for enthusiasts abusing their ears by listening at extreme volume levels that could render them incapable of hearing the music they love so much!  
Good Luck!!

This rulebook was discussed and written by the EMMA international Head Judges & Supervisors and finalised with the support of Costas Christopoulos (Greece), Ronald van Looij, Reinier & Carel Wolf (Netherlands), Werner Rothschof (Austria), Prapasakorn Bhucksasri (Philippines), Per Söder (Sweden), Gennady Litvin (Russia), Antero Kölli (Finland), Steffen Schmidt (Denmark), Somkiat Pookayaporn (Thailand), Chris Körbel, Norbert Tyka, Jan Schleicher, Lars Neuper, Rene Krosse, Volker Simmer & Alex Klett (Germany), Francesco Richichi (Italy), Ketil Skjei (Norway), Cristian Martin, Kevin Hall, Horst Starke & Andrew Ackerley (UK).

#### DISCLAIMER

In any EMMA-sanctioned event, EMMA will not be held responsible, directly or indirectly, for any damage to or loss of competition cars, equipment and other goods.  
Furthermore EMMA urges the competitors and the public in general to protect their hearing.

#### EMMA is a registered trademark

All copies of the official rules, score sheets and other related material, media such as CDs, DVDs, provided digital audio files and the use of brand name and logo are to be authorised by the owner of the European Mobile Media Association.

All relevant Updates, judging details to the Rulebook are published at [www.emmanet.com](http://www.emmanet.com)

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## 2. EMMA Categories & Classes

### SQ Sound Quality

#### E – Category (Entry)

- Up to 3000 €
- Unlimited

##### Installation:

- Only basic installation requirements see matrix on in chapter 10
- No presentation required
- Documentation only for hidden / non-visible components will be required
- System diagram and wiring diagram are required.

##### Restrictions

- Limited to Newcomers – Competitor has never taken part on any EMMA or other sanctioning bodies sound quality competition
- No sponsored cars (invoices for all components must be available for proof of purchase upon request)
- No judges, EMMA officials or professionals
- No performance modifications or self-built equipment on signal route. Cosmetic changes are acceptable.
- No restrictions of modifications to the Installation

Competitors can compete for a maximum of two competition years in E-Category. However, the champion of the national (and/or international) final must be promoted to a higher category.

#### S - Category (skilled)

- OEM
- Up to 4000 €
- Unlimited

##### Installation:

- Average installation requirements see matrix on chapter 10
- No presentation required
- Documentation only for hidden / non-visible components will be required
- System diagram and wiring diagram are required.

##### Restrictions:

- No sponsored cars (invoices for all components must be available for proof of purchase upon request)
- No judges and professionals
- No performance modifications or self-built equipment on signal route. Cosmetic changes are acceptable.
- No restrictions of modifications to the Installation except in OEM class

##### OEM restrictions:

In the Cabin area, only OEM speaker locations and/or grilles available are allowed to be used (for one or more speakers)

- If a higher OEM-trim level as the competitor's car has other/additional speaker locations and/or grilles these can be used too
- No special edited car-models from "tuning companies"; special editions from initial car-manufacturers are acceptable
- Head unit can be changed, or an additional head unit can be installed
- Additional volume control/display can be installed
- Any change that is not related to the car audio system is acceptable

Competitors can compete for a maximum of two competition years in S-Category. However the champion of the national (and/or international) final must be promoted to a higher category.

### **M - Category (Master)**

- **OEM**
- **Up to 5000 €**
- **Limited**
- **Unlimited**

#### **Installation:**

- Moderate installation requirements see matrix in chapter 10
- Documentation is required
- System diagram and wiring diagram are required.

#### **Restriction:**

- In M limited category no judges / EMMA-officials are allowed to compete.
- The champion of the national (and/or international) final of this class will be promoted out of limited class.
- No restrictions regarding installation except in OEM class
- No modified or self-build active components in price limited class

#### **OEM restrictions:**

- In the Cabin Area, only OEM speaker locations available can be used (for one or more speakers)
- If a higher OEM-trim level as the competitor's car has other/additional speaker locations, these can be used too
- No special edited car-models from "tuning companies"; special editions from initial car-manufacturer is acceptable
- Head unit can be changed, or an additional head unit can be installed.
- Additional volume control/display can be installed.
- Speaker grills can be modified or changed, maintaining the size (not bigger or smaller) and shape (not protruding or depressing) of the OEM-grill. Reference for the evaluation of the grill-modification/exchange must be the OEM speaker grill (or if available but not standard in the competitor's car the most advanced speaker grill of that car-Model) - competitor must prove if requested by judging process, e.g. by photo before/after...

Any change that is not related to the car audio system is acceptable

Master Limited is for progression from Skilled categories or "New Industry Professionals" (New = joined the industry less than 2 Years ago).

### **X - Category (Expert)**

- **Limited**



- **Unlimited**

**Installation:**

- Extreme installation is appreciated and beneficial, see matrix in chapter 10
- A detailed documentation
- Presentation is required
- Additional points for design

**Restriction Limited:**

- The car must be able to drive on its own by a driver sitting in the car
- Bonus points up to 15
- Presentation should not exceed 7 Minutes

**Restriction Unlimited:**

- In Unlimited, the car does not necessarily have to be officially registered
- The car must be able to drive on its own by a driver sitting in the car
- Bonus points up to 100
- Presentation should not exceed 15 Minutes

## **MM Multimedia**

- **Multimedia 2.0**
- **Multimedia 5.1**

**Installation:**

- Moderate installation requirements see matrix in chapter 10
- Documentation is required
- Judging must be done from an Automotive seat in an OEM location
- System diagram and wiring diagram are required.

No restrictions

## **ESPL (EMMA Sound Pressure League)**

### **ESPL Categories:**

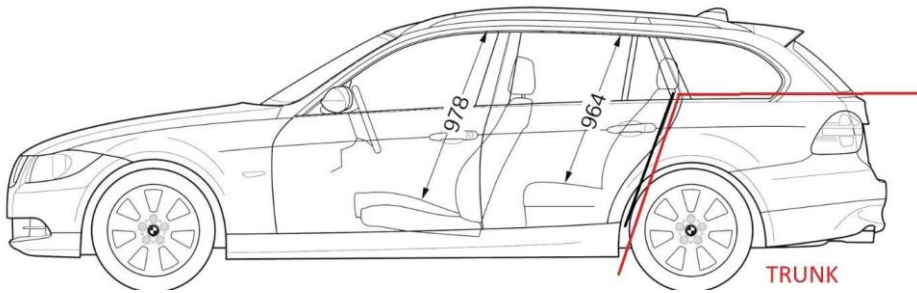
- **ESPL Trunk 3000€**
- **ESPL Trunk limited**

**Installation:**

Moderate installation requirements, see matrix in chapter 10

**Restrictions on all Trunk classes:**

- The subwoofers including enclosure ports etc. must be within the trunk compartment
- Price limit includes DSP, subwoofer amplifiers, woofers and any additional battery. Additional batteries must be added to the car's value sheet in the EMMA Value Database. Batteries are valued by their capacity and battery technology.
- No voltage above 14.6 Volts



- ESPL B / R 4000€
- ESPL B / R Limited

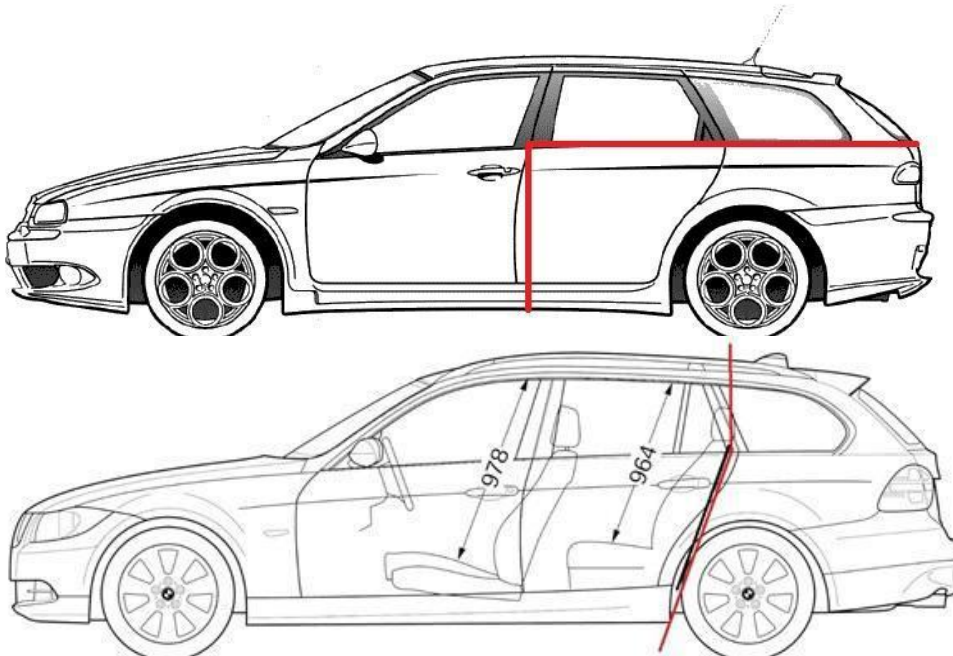
Enclosure from B pillar and no higher than original rear seat (not including head rests)  
Or behind original rear seats to top

**Installation:**

Moderate installation requirements see matrix in chapter 10

**Restrictions:**

- No voltage above 14.6 Volts
- Price limit includes DSP, subwoofer amplifiers, woofers and any additional battery. Additional batteries must be added to the car's value sheet in the EMMA Value Database. Batteries are valued by their capacity and battery technology.
- No limit on woofer size or amount of woofers



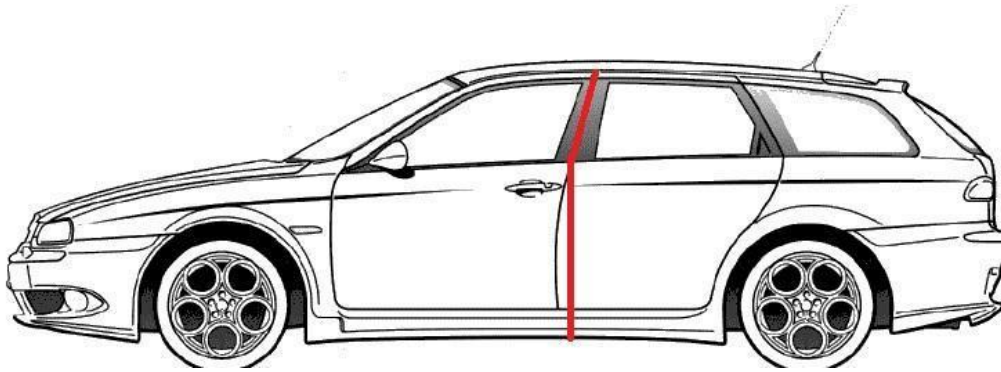
- ESPL Wall 5000€
- ESPL Wall Limited

**Installation:**

Moderate installation requirements, see matrix in chapter 10

**Restrictions:**

- No voltage above 14.6 Volts
- The subwoofers including enclosure ports etc. must be behind the OEM B pillar. The enclosure can reach up to the roof of the car
- Price limit includes DSP, subwoofer amplifiers, woofers and any additional battery. Additional batteries must be added to the car's value sheet in the EMMA Value Database. Batteries are valued by their capacity and battery technology.
- No limit on woofer size or amount of woofers



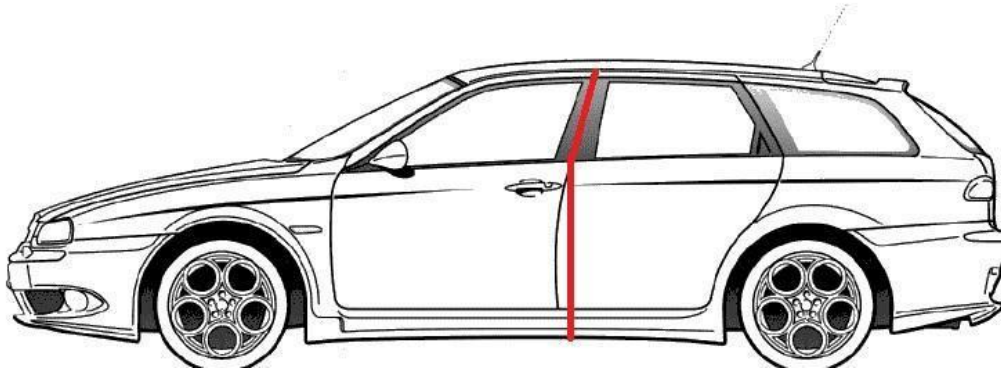
**ESPL Expert**

**Installation:**

Extreme installation is appreciated and beneficial, see matrix in chapter 10.

**Restrictions:**

- The subwoofers including enclosure ports etc. must be behind the OEM B pillar the enclosure can reach up to the roof of the car



**EMMA Tuning**

Vehicle Tuning is judged on SQ and Modifications of the vehicle

**Tuning Stock +**

- OEM Body & Painting,
- Interior modifications are allowed

- Evidence must be provided where the modifications cannot be seen

### **Tuning Custom Trunk**

- Woofers must be in trunk location as per ESPL Trunk,
- Interior, Body & Paint modifications are allowed
- Evidence must be provided where the modifications cannot be seen

### **Tuning Custom unlimited**

- Woofers can be in any location as per ESPL
- Interior, Body & Paint modifications are allowed
- Evidence must be provided where the modifications cannot be seen

## **ESQL (EMMA Sound Quality League)**

### **ESQL Limited**

- Fully usable car in the cabin section
- Woofers in the trunk as per ESPL Trunk

### **ESQL Unlimited**

- Any modification is allowed
- Only the front seats must be usable in the intended way

## **3. EMMA rules – Installation Quality**

The installation quality judging criteria are formulated to promote system durability and longevity, as well as logical integration and visual impression.

The installation quality judging will be performed according to this official rulebook by one or two installation judges (depending on category). These judges are specially qualified and trained to work with the rulebook to determine the installation quality.

After the installation quality judging, the competitor will receive a qualified and objective feedback about the quality of the installed audio system in regards to the criteria outlined within this rulebook.

EMMA installation has been broken down into sections that can be judged and evaluated within an understandable level of classification. The judges will not tell you “your car has a good or a bad installation or what points you have earned”. Together with their qualified judgement and the help of the score sheet they will explain exactly the quality of the installation in all relevant details. The awarded score will be easy to follow for the competitor, if necessary, with support from the EMMA Rulebook. Furthermore, the competitor can learn the potential of their own system installation. The judges are allowed to give the contestants tips and hints on how to improve the installation of their audio system (without using brand names). This will allow the competitor, a qualified dealer or experienced colleagues in a competition team to help improve the installation and potential use of equipment.

## **Installation rules for: SQ E - Category**

To be judged	Content	Points
<b>Presentation to the public</b>	Show off the vehicle & installation to the public during the event time Allow spectators to listen to the system	10

	Will be checked several times a day	
<b>Cleanliness</b>	Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean) <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul>	6
<b>System/Wiring Diagram present</b>	(deduct 2 points per not cleaned area) <p>2 points for each Diagram if present</p>	4
<b>Main fuse present y/n</b>	Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging. (if no, 0 points will be awarded)	10
<b>Are all components securely mounted?</b>	Check all components by physical inspection if fixed y/n <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> <li>• Speakers</li> </ul> <p>(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)</p>	24
<b>Protection of Speakers</b>	A speaker which is not installed completely under the window line (outer frame diameter of speaker) does not need protection speaker protection shall be defined as not flexible. <p>Check whether the affected speakers in the interior compartment's front doors and in the foot-room are protected from physical damage. Hidden speakers like mounted under the dashboard do not need a protection when they cannot be reached with the foot of driver or passenger. One should not be able to touch the membrane with a cylindrical object with a diameter of 3 cm. There should be at least one protective element per speaker.</p> <p>(Deduct 2 points for any speaker not protected, minimum 0). All other speakers do not need protection</p>	5
<b>First Optic impression</b>	Check all components if they create the impression of "a finished installation" or "under construction" <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> <li>• Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10

<b>Total Points</b>	<b>69</b>
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<b>Installation rules for: SQ S – Category</b>
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To be judged	Content	Points
<b>Presentation to the public</b>	Show off the vehicle & installation to the public during the event time Allow spectators to listen to the system System diagram on display for spectators Will be checked several times a day	10
<b>Cleanliness</b>	Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean) <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul> (deduct 2 points per not cleaned area)	6
<b>System/Wiring Diagram present</b>	2 points for each Diagram if present	4
<b>Main fuse present y/n</b>	Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging. (if no, 0 points will be awarded)	10
<b>Are all the wires to the components fused?</b>	Check, if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!) <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> </ul> (if n/a or not visible, deduct 2 points per not fused component, minimum 0)  Power diagram is necessary for judging. EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process	15
<b>Is the fuse value appropriate to the wire size?</b>	Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):	20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere

	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking  
Voltage used for calculation is U=12V

This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.

**Any interior wires visible?**

Check, if any wire of the system installation is visible from the driver's seating position with the doors closed and open.

5

(deduct 2 points for any visible system wire, minimum 0)

Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.

If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!

Hint: this could also mean that the device has not to be installed - because it streams.

**Are all components securely mounted?**

Check all components by physical inspection if fixed y/n

24

- Head Unit
- Other devices
- Amplifiers
- Speakers

(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)

<b>Protection of Speakers</b>	<p>A speaker which is not installed completely under the window line (outer frame diameter of speaker) does not need protection. Speaker protection shall be defined as not flexible.</p> <p>Check whether the affected speakers in the interior compartment's front doors and in the foot-room are protected from physical damage. Hidden Speakers like mounted under the dashboard do not need a protection when they cannot be reached with the foot of driver or passenger. One should not be able to touch the membrane with a cylindrical object with a diameter of 3 cm. There should be at least one protective element per speaker.</p> <p>(Deduct 2 points for any speaker not protected, minimum 0). All other speakers do not need protection</p>	5
<b>Does the vehicle allow a normal use?</b>	<p>EMMA is allowing modifications to the vehicle's interior (except in OEM) to install audio components.</p> <p>The driver/ passenger should sit comfortably and be able to operate the controls of the car without obstruction (look for sub/speakers up front or too high raised floor).</p> <p>As the OEM has given the most safety and comfort in the limited space of the passenger cabin, EMMA will use the OEM surfaces as references.</p> <p>The passenger foot room must not be smaller than the OEM foot room on the driver side between seat and pedals.</p> <p>Judging will be done in the regular driving position of the vehicles operator.</p>	6
<b>First Optic impression</b>	<p>Check all components if they create the impression of "a finished installation" or "under construction"</p> <ul style="list-style-type: none"> <li>● Head Unit</li> <li>● Other devices</li> <li>● Amplifiers</li> <li>● Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10

**Total Points 115**



<b>Installation rules for: SQ M – Category and Multimedia</b>
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To be judged	Content	Points
<b>Presentation to the public</b>	<p>Show off the vehicle &amp; installation to the public during the event time</p> <p>Allow spectators to listen to the system</p> <p>System diagram on display for spectators</p> <p>Exception: at the event active judges / back office staff's cars can remain closed due to safety reason</p> <p>Will be checked several times a day</p>	10
<b>Bonus Presentation to the public</b>	Some activity by the competitor to promote their car / installation / presentation during a dedicated period of time	5
<b>Cleanliness</b>	<p>Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean)</p> <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul> <p>(deduct 2 points per not cleaned area)</p>	6
<b>System documentation</b>	<p>Check for:</p> <ul style="list-style-type: none"> <li>• Signal flow-chart</li> <li>• Wire/Fuse Diagram</li> <li>• Documentation (photo-log) of not accessible connections / components</li> </ul> <p>(deduct 1 point per missing element, minimum 0)</p>	10
<b>Explanation of system to the judges</b>	<p>Up to 7 minute explanation of the system to the judges by owner of vehicle / dedicated presenter (no movie)</p> <p>Hint: Focus on how and why the installation was built, not on brands or the final result.</p> <p>1 point will be deducted per 30sec. Over time</p>	5
<b>Main fuse present y/n</b>	<p>Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging.</p> <p>(if no, 0 points will be awarded)</p>	10
<b>Are all the wires to the components fused?</b>	<p>Check if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!)</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> </ul>	15

(if n/a or not visible, deduct 2 points per not fused component, minimum 0)

Power diagram is necessary for judging.

EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process

**Is the fuse value appropriate to the wire size?**

Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):

20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking.

Voltage used for calculation is U=12V

This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.

<b>Any interior wires visible?</b>	<p>Check, if any wire of the system installation is visible from the driver's seating position with the doors closed and open.</p> <p>(deduct 2 points for any visible system wire, minimum 0)</p> <p>Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.</p> <p>If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!</p> <p>Hint: this could also mean that the device must not be installed - because it streams.</p>	5
<b>Wires properly terminated?</b>	<p>Check, if all wires are properly terminated - either by physical inspection or by photo log</p> <p>(deduct 1 point per wire not properly terminated wire, minimum 0)</p>	5
<b>Wire terminations protected y/n</b>	<p>Check, if wire terminations are installed in such a way that short circuits are avoided / covered by a non-conductive material in vehicles driving condition (all panels/covers on etc.) and appropriate measures are taken if exposed to moisture (e.g. in the doors) - either by physical inspection or by photo log</p> <p>(deduct 1 point per wire that's not properly terminated, minimum 0)</p>	10
<b>Wires protected from damage y/n</b>	<p>Wires that pass metal (e.g. from engine compartment to interior) should be protected by grommets, rubbers or similar</p> <p>For wires that are mechanically stressed (e.g. into the door) or that are close to moving parts (e.g. engine-belts) protective sleeving should be used if not installed to OEM cable trays.</p> <p>(deduct 1 point per not properly protected wire, minimum 0)</p>	5
<b>Are all components securely mounted?</b>	<p>Check all components by physical inspection if fixed y/n</p> <ul style="list-style-type: none"> <li>● Head Unit</li> <li>● Other devices</li> <li>● Amplifiers</li> <li>● Speakers</li> </ul> <p>(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)</p>	24
<b>Protection of Speakers</b>	<p>A speaker which is not installed completely under the window line (outer frame diameter of speaker) does not need protection Speaker protection shall be defined as not flexible.</p> <p>Check whether the affected speakers in the interior compartment's front doors and in the foot-room are protected from physical damage.</p>	5

<b>Does the vehicle allow a normal use?</b>	<p>Hidden Speakers like mounted under the dashboard do not need a protection when they cannot be reached with the foot of driver or passenger. One should not be able to touch the membrane with a cylindrical object with a diameter of 3 cm. There should be at least one protective element per speaker.</p>	
	<p>(Deduct 2 points for any speaker not protected, minimum 0). All other speakers do not need protection</p> <p>EMMA is allowing modifications to the vehicle's interior (except in OEM) to install audio components.</p>	6
	<p>The driver/ passenger should sit comfortably and be able to operate the controls of the car without obstruction (look for sub/speakers up front or too high raised floor).</p>	
	<p>As the OEM has given the most safety and comfort in the limited space of the passenger cabin, EMMA will use the OEM surfaces as references.</p> <p>The passenger foot room must not be smaller than the OEM foot room on the driver side between seat and pedals.</p> <p>Judging will be done in the regular driving position of the vehicles operator.</p>	
<b>First Optic impression</b>	<p>Check all components if they create the impression of "a finished installation" or "under construction"</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> <li>• Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10
<b>Craftsmanship</b>	<p>Check wire-routing, terminations, installation of components, installation of panels, surface finishes, equal gaps, etc. for the categories:</p> <ul style="list-style-type: none"> <li>• Wiring</li> <li>• Head Unit</li> <li>• Amplifiers</li> <li>• Speakers</li> <li>• Other components</li> </ul> <p>(deduct 2 points per element where no effort was taken (to modify it from OEM state), deduct 1 point per element where poor effort was taken, minimum 0 =&gt; note on the score sheet for what points are deducted)</p>	10
		<b>Total Points 161</b>

<b>Installation rules for: SQ X Limited - Category</b>
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To be judged	Content	Points
<b>Presentation to the public</b>	<p>Show off the vehicle &amp; installation to the public during the event time</p> <p>Allow spectators to listen to the system</p> <p>System diagram on display for spectators</p> <p>Exception: at the event active judges / back office staff's cars can remain closed due to safety reason</p> <p>Will be checked several times a day</p>	10
<b>Bonus Presentation to the public</b>	Some activity by the competitor to promote their car / installation / presentation during a dedicated period of time	5
<b>Cleanliness</b>	<p>Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean)</p> <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul> <p>(deduct 2 points per not cleaned area)</p>	6
<b>System documentation</b>	<p>Check for:</p> <ul style="list-style-type: none"> <li>• Signal flow-chart</li> <li>• Wire/Fuse Diagram</li> <li>• Documentation (photo-log) of not accessible connections / components</li> </ul> <p>(deduct 1 point per missing element, minimum 0)</p>	10
<b>Explanation of system to the judges</b>	<p>Up to 7 minute explanation of the system to the judges by owner of vehicle / dedicated presenter (no movie)</p> <p>Hint: Focus on how and why the installation was built, not on brands or the final result.</p> <p>1 point will be deducted per 30sec. Over time</p>	10
<b>Main fuse present y/n</b>	<p>Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging.</p> <p>(if no, 0 points will be awarded)</p>	10

**Are all the wires to the components fused?**

Check, if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!)

15

- Head Unit
- Other devices
- Amplifiers

(if n/a or not visible, deduct 2 points per not fused component, minimum 0)

Power diagram is necessary for judging.

EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process

**Is the fuse value appropriate to the wire size?**

Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):

20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking.

Voltage used for calculation is U=12V

This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

	<p>If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.</p>	
<b>Any interior wires visible?</b>	<p>Check, if any wire of the system installation is visible from the driver's seating position with the doors closed and open.</p> <p>(Deduct 2 points for any visible system wire, minimum 0)</p> <p>Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.</p> <p>If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!</p> <p>Hint: this could also mean that the device must not be installed - because it streams.</p>	5
<b>Wires properly terminated?</b>	<p>Check, if all wires are properly terminated - either by physical inspection or by photo log</p> <p>(deduct 1 point per not properly terminated wire, minimum 0)</p>	5
<b>Wire terminations protected y/n</b>	<p>Check, if wire terminations are installed in such a way that short circuits are avoided / covered by a non-conductive material in vehicles driving condition (all panels/covers on etc.) and appropriate measures are taken if exposed to moisture (e.g. in the doors) - either by physical inspection or by photo log</p> <p>(deduct 1 point per not properly protected wire termination, minimum 0)</p>	10
<b>Wires protected from damage y/n</b>	<p>Wires that pass metal (e.g. from engine compartment to interior) should be protected by grommets, rubbers or similar</p> <p>For wires that are mechanically stressed (e.g. into the door) or that are close to moving parts (e.g. engine-belts) protective sleeving should be used if not installed to OEM cable trays.</p> <p>(deduct 1 point per not properly protected wire, minimum 0)</p>	5
<b>Are all components securely mounted?</b>	<p>Check all components by physical inspection if fixed y/n</p> <ul style="list-style-type: none"> <li>● Head Unit</li> <li>● Other devices</li> <li>● Amplifiers</li> <li>● Speakers</li> </ul>	24

(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)

<b>Protection of Speakers</b>	<p>A speaker which is not installed completely under the window line (outer frame diameter of speaker) does not need protection. Speaker protection shall be defined as not flexible.</p> <p>Check whether the affected speakers in the interior compartment's front doors and in the foot-room are protected from physical damage. Hidden Speakers like mounted under the dashboard do not need a protection when they cannot be reached with the foot of driver or passenger. One should not be able to touch the membrane with a cylindrical object with a diameter of 3 cm. There should be at least one protective element per speaker.</p> <p>(Deduct 2 points for any speaker not protected, minimum 0). All other speakers do not need protection</p>	5
<b>Does the vehicle allow a normal use?</b>	<p>EMMA is allowing modifications to the vehicle's interior (except in OEM) to install audio components.</p> <p>The driver/ passenger should sit comfortably and be able to operate the controls of the car without obstruction (look for sub/speakers up front or too high raised floor).</p> <p>As the OEM has given the most safety and comfort in the limited space of the passenger cabin, EMMA will use the OEM surfaces as references.</p> <p>The passenger foot room must not be smaller than the OEM foot room on the driver side between seat and pedals.</p> <p>Judging will be done in the regular driving position of the vehicles operator.</p>	6
<b>First Optic impression</b>	<p>Check all components if they create the impression of "a finished installation" or "under construction"</p> <ul style="list-style-type: none"> <li>● Head Unit</li> <li>● Other devices</li> <li>● Amplifiers</li> <li>● Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10



<b>Craftsmanship</b>	Check wire-routing, terminations, installation of components, installation of panels, surface finishes, equal gaps, etc. for the categories: <ul style="list-style-type: none"> <li>• Wiring</li> <li>• Head Unit</li> <li>• Amplifiers</li> <li>• Speakers</li> <li>• Other components</li> </ul> (deduct 2 points per element where no effort was taken (to modify it from OEM state), deduct 1 point per element where poor effort was taken, minimum 0 => note on the score sheet for what points are deducted)	50
<b>Design of interior</b>	components installed to the interior follow a clear design idea y/n  (deduct 1 point per element not following the design idea, minimum 0)	5
<b>Design of trunk</b>	components installed to the trunk follow a clear design idea y/n  (deduct 1 point per element not following the design idea, minimum 0)	5
<b>Bonus points</b>	Award bonus points for elements that belong to the installation and <ul style="list-style-type: none"> <li>• That promote components in an extraordinary way,</li> <li>• Attract spectators (no noise accepted!!!),</li> <li>• Allow normal use of the vehicle without sacrifice though a system is installed,</li> <li>• That make it a creative system presentation</li> </ul> The competitor must submit their requests (max. 20) for bonus points together with their presentation  (up to 3 bonus points possible per request - 1 for the idea itself, 1 if average realization, 2 if good realization)	15

<b>Total Points</b>	<b>231</b>
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### Installation rules for: SQ X Unlimited - Category

To be judged	Content	Points
<b>Presentation to the public</b>	Show off the vehicle & installation to the public during the event time Allow spectators to listen to the system System diagram on display for spectators  Exception: at the event active judges / back office staff's cars can remain closed due to safety reason. Will be checked several times a day	10
<b>Bonus Presentation to the public</b>	Some activity by the competitor to promote their car / installation / presentation during a dedicated period of time	5
<b>Cleanliness</b>	Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean)	6

	<ul style="list-style-type: none"> <li>• Exterior clean y/n</li> <li>• Passenger compartment clean y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul> <p>(deduct 2 points per not cleaned area)</p>	
<b>System documentation</b>	<p>Check for:</p> <ul style="list-style-type: none"> <li>• Signal flow-chart</li> <li>• Wire/Fuse Diagram</li> <li>• Documentation (photo-log) of not accessible connections / components</li> </ul> <p>(deduct 1 point per missing element, minimum 0)</p>	10
<b>Explanation of system to the judges</b>	<p>Up to 15 minute explanation of the system to the judges by owner of vehicle / dedicated presenter (no movie)</p> <p>Hint: Focus on how and why the installation was built, not on brands or the final result.</p> <p>1 point will be deducted per 30sec. Over time</p>	10
<b>Main fuse present y/n</b>	<p>Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging.</p> <p>(if no, 0 points will be awarded)</p>	10
<b>Are all the wires to the components fused?</b>	<p>Check if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!)</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> </ul> <p>(if n/a or not visible, deduct 2 points per not fused component, minimum 0)</p> <p>Power diagram is necessary for judging. EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process</p>	15
<b>Is the fuse value appropriate to the wire size?</b>	<p>Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):</p>	20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere

	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking.

Voltage used for calculation is U=12V

This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

**Any interior wires visible?**

Check, if any wire of the system installation is visible from the driver's seating position with the doors closed and open.

5

(deduct 2 points for any visible system wire, minimum 0)

Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.

If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!

Hint: this could also mean that the device must not be installed - because it streams.

**Wires properly terminated?**

Check, if all wires are properly terminated - either by physical inspection or by photo log

5

(deduct 1 point per not properly terminated, minimum 0)

<b>Wire terminations protected y/n</b>	<p>Check, if wire terminations are installed in such a way that short circuits are avoided / covered by a non-conductive material in vehicles driving condition (all panels/covers on etc.) and appropriate measures are taken if exposed to moisture (e.g. in the doors) - either by physical inspection or by photo log</p> <p>(deduct 1 point per not properly protected wire termination, minimum 0)</p>	10
<b>Wires protected from damage y/n</b>	<p>Wires that pass metal (e.g. from engine compartment to interior) should be protected by grommets, rubbers or similar</p> <p>For wires that are mechanically stressed (e.g. into the door) or that are close to moving parts (e.g. engine-belts) protective sleeving should be used if not installed to OEM cable trays.</p> <p>(deduct 1 point per not properly protected wire, minimum 0)</p>	5
<b>Are all components securely mounted?</b>	<p>Check all components by physical inspection if fixed y/n</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> <li>• Speakers</li> </ul> <p>(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)</p>	24
<b>Protection of Speakers</b>	Protection of speakers is not required in X Unlimited category.	
<b>First Optic impression</b>	<p>Check all components if they create the impression of "a finished installation" or "under construction"</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> <li>• Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10
<b>Craftsmanship</b>	<p>Check wire-routing, terminations, installation of components, installation of panels, surface finishes, equal gaps, etc. for the categories:</p> <ul style="list-style-type: none"> <li>• Wiring</li> <li>• Head Unit</li> <li>• Amplifiers</li> <li>• Speakers</li> <li>• Other components</li> </ul> <p>(deduct 2 points per element where no effort was taken (to modify it from OEM state), deduct 1 point per element where poor effort was taken, minimum 0 =&gt; note on the score sheet for what points are deducted)</p>	50

<b>Design of interior</b>	components installed to the interior follow a clear design idea y/n  (deduct 1 point per element not following the design idea, minimum 0)	10
<b>Design of trunk</b>	components installed to the trunk follow a clear design idea y/n  (deduct 1 point per element not following the design idea, minimum 0)	10
<b>Overall design of the vehicle</b>	To score full points, the car itself and the components installed in it must show a design theme that was followed, throughout the car; inside, outside and to the trunk compartment. It should be immediately clear that the car was designed as a project from beginning, with a clear statement to the judges and the viewers.  The kind of design theme is of no matter; but the competitor should be aware that an original looking car is not able to score any points on the areas where no effort for design was taken.  (deduct 1 point per element not following the design idea, minimum 0)	10
<b>Bonus points</b>	Award bonus points for elements that belong to the installation and <ul style="list-style-type: none"> <li>• That promote components in an extraordinary way,</li> <li>• Attract spectators (no noise accepted!!!),</li> <li>• Allow normal use of the vehicle without sacrifice though a system is installed,</li> <li>• That make it a creative system presentation</li> </ul> <p>The competitor must submit their requests (max. 50) for bonus points together with their presentation</p> <p>(up to 3 bonus points possible per request - 1 for the idea itself, 1 if average realization, 2 if good realization)</p>	100

<b>Total Points</b>	<b>325</b>
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<b>Installation rules for: ESPL (T / R / B / W)/ ESQ – Limited Category</b>
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<b>To be judged</b>	<b>Content</b>	<b>Points</b>
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<b>Presentation to the public</b>	<p>Show off the vehicle &amp; installation to the public during the event time</p> <p>Allow spectators to listen to the system</p> <p>Exception: at the event active judges / back office staff's cars can remain closed due to safety reason</p> <p>Will be checked several times a day</p>	10
<b>Cleanliness</b>	<p>Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean)</p> <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul> <p>(deduct 2 points per not cleaned area)</p>	6
<b>Main fuse present y/n</b>	<p>Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging.</p> <p>(if no, 0 points will be awarded)</p>	10
<b>Are all the wires to the components fused?</b>	<p>Check, if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!)</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> </ul> <p>(if n/a or not visible, deduct 2 points per not fused component, minimum 0)</p>	15
<b>System/Wiring Diagram</b>	<p>A Power diagram is necessary for judging.</p> <p>EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process.</p> <p>2 Points for each diagram if present</p>	4
<b>Is the fuse value appropriate to the wire size?</b>	<p>Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):</p>	20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere

	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking.  
Voltage used for calculation is U=12V

This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.

**Any interior wires visible?**

Check, if any wire of the system installation is visible from the drivers seating position with the doors closed.

5

(deduct 2 points for any visible system wire, minimum 0)

Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.

If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!

Hint: this could also mean that the device must not be installed - because it streams.

**Are all components securely mounted?**

Check all components by physical inspection if fixed y/n

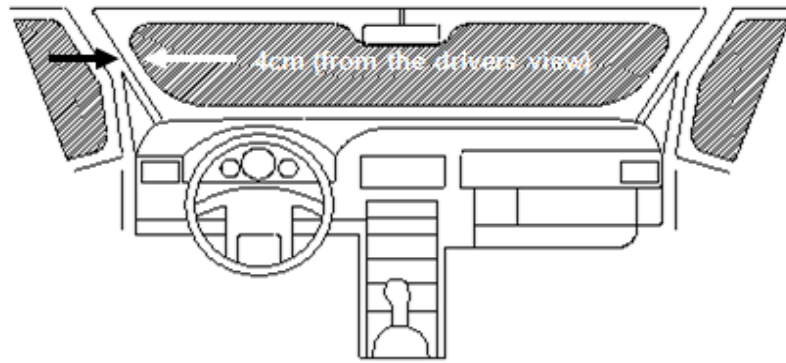
24

- Head Unit
- Other devices
- Amplifiers
- Speakers

(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)

<b>Does the vehicle allow a normal use?</b>	<p>EMMA is allowing modifications to the vehicle's interior (except in OEM) to install audio components.</p> <p>The driver/ passenger should sit comfortably and be able to operate the controls of the car without obstruction (look for sub/speakers up front or too high raised floor).</p> <p>As the OEM has given the most safety and comfort in the limited space of the passenger cabin, EMMA will use the OEM surfaces as references.</p> <p>The passenger foot room must not be smaller than the OEM foot room on the driver side between seat and pedals.</p> <p>Judging will be done in the regular driving position of the vehicles operator.</p>	6
<b>First Optic impression</b>	<p>Check all components if they create the impression of "a finished installation" or "under construction"</p> <ul style="list-style-type: none"> <li>● Head Unit</li> <li>● Other devices</li> <li>● Amplifiers</li> <li>● Speakers / Speaker enclosures</li> </ul> <p>(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)</p>	10
<b>Limited View</b>	<p>The Installation judge check for restricted view due to installations on dash / pillars / doors the judge will sit in the designated listening position and check if anything of the audio systems Installation is interfering the view. If necessary a measure perpendicular to the line of sight will be done by the Installation judge, from the drivers/judging position. If the installation is restricting the view to the road/sides (not to the car itself) it will be a not Ok-situation. This rule applies to the wind shield and the two front side windows. Triangular windows within the A-Pillar/ front doors will not be considered as long as view through these windows are not higher and/or longer than half the height and length of the side window.</p>	-6





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

Maximum deduction 6 Points.

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).

**Total Points 110**

#### Installation rules for: ESPL Expert – Category / ESQL Unlimited - Category

To be judged	Content	Points
<b>Presentation to the public</b>	Show off the vehicle & installation to the public during the event time Allow spectators to listen to the system System diagram on display for spectators  Exception: at the event active judges / back office staff's cars can remain closed due to safety reason	10
<b>Cleanliness</b>	Will be checked several times a day Vehicle exterior should be "car-wash-clean", interior should be vacuumed (not perfect but reasonably clean) <ul style="list-style-type: none"> <li>• Car Wash clean y/n</li> <li>• Passenger compartment vacuumed y/n</li> <li>• Dedicated components of the system installed in the engine compartment &amp; trunk clean y/n</li> </ul>	6
<b>Main fuse present y/n</b>	(deduct 2 points per not cleaned area) Check, if a main fuse is installed into the main power wire within 40cm from any positive battery post and/or before passing any metal panel. Power diagram is necessary for judging.  (if no, 0 points will be awarded)	10

<b>Are all the wires to the components fused?</b>	<p>Check, if a fuse is installed in the wire for any component belonging to the audio/multi-media system. All these fuses must be visible within three minutes (for all in total, not three minutes for every fuse!!!)</p> <ul style="list-style-type: none"> <li>• Head Unit</li> <li>• Other devices</li> <li>• Amplifiers</li> </ul> <p>(if n/a or not visible, deduct 2 points per not fused component, minimum 0)</p>	15
<b>System/Wiring Diagram</b>	<p>A Power diagram is necessary for judging.</p> <p>EMMA Back Office will hand out a form at the registration where all components, wire diameters as well as fuses should be filled in by the competitor in case that no wiring diagram is prepared and available for the judging process.</p> <p>2 Points for each diagram if present</p>	4
<b>Is the fuse value appropriate to the wire size?</b>	<p>Check, if any fuse belonging to the audio system is of appropriate size for the wire it is protecting (according to the VW75212 - Dimensionierung von Leitungen und Sicherungen im Kraftfahrzeug):</p>	20

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

Alternatively, wire sizes and fuse rates can be calculated with the formulas in the judge book. In this case, the calculations must be documented and handed out to the judges for checking.

Voltage used for calculation is the nominal voltage of the system.

If Voltage is higher than 12V a new calculation of the fuse sizes is necessary and must be provided by the competitor for improvement. This rule applies to all electrical conductors in the power system, power distribution blocks, busbars etc. On multiple battery systems pay close attention to all batteries / fuses feeding current to any distribution block. There can be power sources connected on both sides of a short circuit and the conductor must withstand the combined current of all sources feeding the short circuit.

(if n/a, wrong size or not visible, deduct 2 points per not appropriate fuse, minimum 0)

If the car's OEM ground cable is not upgraded the biggest allowed size for the main fuse (or combined size of multiple main fuses) is 100 A unless the competitor provides a calculation with the enclosed formula using car's OEM ground cable size.

**Any interior wires visible?**

Check, if any wire of the system installation is visible from the driver's seating position with the doors closed.  
(deduct 2 points for any visible system wire, minimum 0)

5

Mobile devices such as smartphones that are connected by the cable that goes with the device to the connector of the HU/Car and the device itself will be operated at the head unit, no attention will be paid to this cable.

If the mobile device is used to operate the system (change track would be enough), there should be no wire visible (visible connector is ok)!

Hint: this could also mean that the device must not be installed - because it streams.

**Are all components securely mounted?**

Check all components by physical inspection if fixed y/n

24

- Head Unit
- Other devices
- Amplifiers
- Speakers

(if n/a, points will be awarded, deduct 2 points per not fixed component, minimum 0)

**First Optic impression**

Check all components if they create the impression of "a finished installation" or "under construction"

10

- Head Unit
- Other devices
- Amplifiers
- Speakers / Speaker enclosures

(if n/a, points will be awarded, deduct 1 point per "under construction" component, minimum 0)

**Overall design of the vehicle**

To score full points, the car itself and the components installed in it must show a design theme that was followed, throughout the car; inside, outside and to the trunk compartment. It should be immediately clear that the car was designed as a project from beginning, with a clear statement to the judges and the viewers.

10

The kind of design theme is of no matter; but the competitor should be aware that an original looking car is not able to score any points on the areas where no effort for design was taken.

(deduct 1 point per element not following the design idea, minimum 0)

**Total Points 114**

## 4. EMMA rules – Sound Quality

### Pre Judging Check

#### Checking charger connected y/n

1. Before the sound quality judging starts, the judges will check if any charger/external power supply is connected and request the competitor to disconnect it.
2. It is forbidden to use any power supply except the cars primary battery together with possible installed additional batteries connected to the system during the sound quality judging.
3. Besides the battery system no additional sources of energy like solar panels, generators, fuel cells, etc. are allowed during sound judging. They must be disconnected or put out of operation not charging the battery.
4. The judges will document that no charger is connected in the relevant check box on the score sheet.

#### Verification of reasonable driving position y/n

1. Before the sound quality judging starts, the judges will check that the competitor is able to operate the gear-stick, the steering wheel and the pedals with the adjustment of the seat as for the SQ-judging to verify the reasonable driving position. Exceptions are only allowed for people smaller than 1,70m.
2. The judges will document the reasonable driving position in the relevant check box on the score sheet.

#### Channel verification

Track 2 & 3 of the official EMMA Sound Quality source will be used. If the system has the correct left and right channel integrity, the judges will mark it on the score sheet. If the judges find that channels are reversed, they will notify the competitor. The competitor then has the opportunity to correct the "problem" within five minutes repair time. If the problem could not be corrected, the competitor will decide if they want the system to be judged.

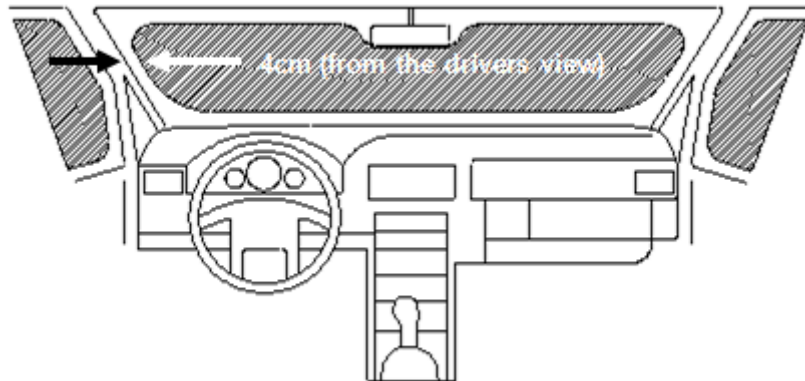
#### Calibration of volume

1. The Competitor is responsible for suggesting the correct volume for the sound judgement. The Judges will use this volume.
2. Only if the suggested volume is "Too Loud" (more than 80db unweighted slow measurement with pink noise), the Judge will take a measurement to set the correct volume.
3. If the Volume is too low, it is up to the Competitor to continue with the same Volume or ask the judge to adjust the Volume.
4. The digital readout on the display or the angle of the volume control will be noted in the designated box on the score-sheet.
5. Furthermore, the equipment used for reproducing the EMMA Sound Quality source will be noted on the score sheet.

### Limited view

The Sound Quality judge check for restricted view due to installations on dash / pillars / doors the judge will sit in the designated listening position and check if anything of the audio systems Installation is interfering the view. If necessary, a measure perpendicular to the line of sight will be

done by the sound judge, from the drivers/judging position. If the installation is restricting the view to the road/sides (not to the car itself) it will be a not Ok-situation. This rule applies to the wind shield and the two front side windows. Triangular windows within the A-Pillar/ front doors will not be considered as long as the view through these windows is not higher and/or longer than half the height and length of the side window.



If the view/use is restricted, the Judges deduct 3 Points for each not OK Situation.  
Maximum deduction 6 Points.

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).

### A quick note on sound quality

A good audio system will faithfully reproduce the original recording by offering accurate frequency response and staging. Good frequency response reproduces high tones such as cymbals, the human voices and most instruments, and down to the very low tones from synthesizers and drums. Frequency response includes timbre (the accurate replication of an instrument), linearity (the tonal quality is the same regardless of volume level), and clarity (lack of distortion of the original signal). Good staging offers the illusion of a stage upon which players are located in front and it has a sense of height, width, and depth. Imaging is a sound system's ability to correctly place the instruments on the imaginary stage.

#### Please note:

EMMA-Sound-Quality-recordings have been produced to best replicate real true sounding music, not digitized to perfection losing the pure essence but to give the most realistic interpretation.

The criteria of the following sections can be judged in Sound Quality – depending on the category. A detailed description of what criteria will be judged can be found in the matrix on the last pages of this rulebook.

### Imaging Characteristics

#### Imaging – Position

The sound stage is defined by the left and right boundaries established during the sound stage judging.

The technical tracks 2-6 for positioning and focus will be used to define the five positions. The centre position should be exactly in the middle between the ultimate left and ultimate right. Left centre should be exactly in the middle between ultimate left and centre. Right-centre should be exactly in the middle between centre and ultimate right. This means that all positions should be evenly spaced. When the sound is not coming from the position where it should appear, less points will be given for that position. For each correct position of each instrument the judges will score 1 Point.

The human voice is used as the reference of each position.

**The 5 different sounds appear at each position in the following order:**

	Attack Frequency
Bass	80 Hz
Guitar	200 Hz
Gong	500 Hz
Cowbell	800 Hz
Cymbal	2,5 KHz

## Imaging – Focus

The focus will be judged for each of the above 5 positions using the tracks 2-6 for positioning and focus. There are 5 different instruments played on every track and each instrument will be scored separately. The instruments should appear exactly on their designated position. If they are out of focus the judge will note 0 points.

Focus means correct size of each instrument, size of each tone should be considered relatively to one another. The size of focus will differ from the Frequency. Please take care not to confuse size with volume. Louder does not mean bigger. Each different sound in each position should be distinct with the correct focus-size. For each correct focus of each instrument the judges will score 1 Point.

## Sound Stage

The sound stage produced by an audio system can be defined as the perceived space from which the sound originates. Much like the stage in a concert hall is the space from which the sound originates. The term "Imaging" describes a sound system's ability to reproduce the sound of instruments in their correct locations and proportions on the sound stage.

The object of the judging is to define the boundaries of the sound stage created by the cars audio system. These boundaries must be identified in order to judge imaging correctly. We use Track 7 (moving track) to check the sound stage.

### Sound Stage – Distance to sound stage

The designated moving track is used to find out the distance of where the soundstage begins in relation to the listener's position. The instruments playing in the centre of the soundstage and the instrument that is closest to you is the beginning of the soundstage.

Instruments in center position are:

Bass Drum, Fretless Bass, Soprano Saxophone, Fender Jazz Bass, Snare

### Sound Stage – Width

The designated moving track is used to judge stage width. The width of the sound stage defines the distance from the ultimate “left” position to the ultimate “right” position relative to the vehicle. The objective is to create a wide sound stage for both listeners. Exceptional sound systems will have sound stages that seem to exceed the physical boundaries of the vehicle interior.

At this point, it is only of interest where the placements of “left” and “right” positions are on the virtual sound stage.

### Sound stage – Height

The height of the sound stage defines the perceived height (points of origin of the sound in between the entire width of the sound stage) in relation to horizon level and how consistent this height appears to be during the entire range of frequencies.

The object of the competition is to achieve a “stable” sound at horizon level with a natural sense of the cars’ space above that point. Instruments and voices should be originated entirely at that height with no portion of them coming from below or above the sound stage.

Pay particular attention to make sure that the stage height remains stable, from left to right. Some vehicles may exhibit a good height in the center with left and right boundaries dropping lower. This should be taken into account in the scoring. All instruments should appear at the same height.

### Sound Stage – Room Information

Track 7 (moving track) is used to judge Room Information. Room information or Ambience is a psycho-acoustic phenomenon that can be defined as the perceived space around a sound source.

#### Room information is scored:

- Left / right,
- Front / rear and
- Floor / ceiling.

<b>1 point</b>	No Room - Flat stage
<b>2 points</b>	Just a little bit of Room - Definitely smaller than the size of the car
<b>3 points</b>	Some Room - About the size of the car
<b>4 points</b>	Good Room size - A little bigger than the size of the car
<b>5 points</b>	Extraordinary Room size - A lot bigger than the size of the car

### Tonal Accuracy

#### Tonal Accuracy and overall spectral balance

Using tracks 8, 9, 10 and 11 the sound system should reproduce a recording as realistically and authentically 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 as possible to the intentions of the producer. Therefore, EMMA trains the Sound Quality judges to fully understand exactly how the EMMA Sound Quality recordings have been 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**
- **Mid-bass**
- **Midrange**
- **High frequencies**

and the overall Spectral Balance of the entire audible frequency range.

Under Tonal Accuracy, the judges will concentrate on each range specifically, ignoring the spectral balance of the whole spectrum.

Under overall spectral balance, the judges will evaluate how well the four sections combine together to create a full picture approximating the originality of the EMMA Sound Quality recordings as much as possible.

#### **Sub-Bass (10 Hz – 60 Hz)**

The sounds reproduced by the system in this range should be immediately recognisable, realistically weighted, articulate, and free of distortion and overhang. It is vital to recognise the difference between good extension and overhang. Overhang refers to a blurring or exaggeration of the decay time of a sound. Accurate low frequency extension is a desirable trait.

#### **Mid-bass (60 Hz – 200 Hz)**

The judges will concentrate on the sound produced by the Voices, Bass, Brass, Tuba, Trombone, French Horn, Trumpet, Woodwinds, Clarinet, Oboe, English Horn, Alto Sax, Bass, Bass Clarinet, Contrabass, Tympani, Bass Violin, Cello, Guitar, Viola, Violin, Harp, Piano, Organ, tambourine, Drums, Floor Tom, Harp.

These should be reproduced smoothly with good articulation and detail. Particular attention should be paid to the attack and the decay of drums and the bass guitar. Because of the small size of the car as a listening environment, problems with resonance, sound peaks and standing waves are common in this range. The best systems control these problems so that they do not interfere with fidelity.

#### **Midrange (200 Hz – 3 KHz)**

This range contains the vast majority of musical information in most recordings. The judges will concentrate on: Voices, Bass, Brass, Tuba, Trombone, French Horn, Trumpet, Woodwinds, Flute, Clarinet, Oboe, English Horn, Alto Saxophone, Bass, Strings, Cello, Guitar, Viola, Violin, Harp, Piano, Organ, Piccolo, Bells, Drums, Tambourine, Cymbals, High Hat, Ride, Shaker, Rattle Snake, Tom Tom, Floor Tom, Harp. Voices should sound realistic without uncharacteristic ringing, thin sound, dullness or distortion.

#### **High-Frequencies (3 KHz-inaudibility)**

The judges will concentrate on Voices, Woodwinds, Piccolo, Flute, Clarinet, Strings, Violin, Triangle, Brushes, Harp, Piano, Organ, Bells, Tom Tom, Cymbals, High Hat, Ride, Shaker, Rattle Snake, Harp, and the sibilance (tendency to exaggerate "s" or "f", or "t" sounds) in the voice recordings. These should sound accurate, smooth, neither too dull nor too bright and should not exhibit any harshness, thin sound, excessive sibilance or distortion.

**Judges listen to the quality of each frequency under tonal accuracy and not the relative volume.**

**Relative volume is one of the parts that will be judged under Spectral Balance.**

### **Overall Spectral Balance**

Relative Volume of each frequency is judged under spectral balance. Track 10 is used to judge Overall Spectral Balance.

While in the chapter before the four sections sub-bass, mid-bass, midrange and high frequencies were evaluated each individually resulting in separate points – here it is evaluated how they combine together to create a full picture.

Depending on how well they are balanced and play together, they will receive results accordingly.



Superior systems will sound effortless and natural with any of the judging tracks. Weaker systems will exhibit distortion, unnatural coloration, dynamic compression, and frequency response errors, which lead to listening fatigue and lend an unnatural sound to the music.

Does the system create the illusion of realistic instruments and voices as you listen to the judging tracks? Is the distribution of energy between the frequency ranges appropriate and natural sounding? Particular attention should be paid to how smoothly the system integrates the different frequency ranges.

The same track of the official EMMA Sound Quality recordings will be played again after a manual adjustment of the volume by the judges of approx. +6dB allowing the sound quality judges to evaluate the ability of the sound system to reproduce the overall spectral balance as described before at a higher volume level. This may also indicate the dynamic abilities of the sound system. At high levels, the judges will listen to the same items described before but also for solid, realistic dynamics. Instruments should have a realistic attack and impact that does not get compressed by distortion (amplifiers clipping or speaker system limitations).

### Listening Pleasure

Now since the sound quality judges have been listened to the competitor's sound system for quite a while, they must determine the enjoyment the music generated to the listener and the acoustic impression of the music. There is no special track; listening pleasure reflects the judge's experiences over the entire sound quality judging process.

### Adjustments

While the SQ judges are actually listening to and operating the audio system, they will judge adjustments for noise and system handling. The judges should briefly note what caused any adjustment to the score in the comments section of the score sheet.

A well-executed installation should be free from any noise at all listening levels. Noise is defined as any sound not present on the original EMMA Sound Quality recordings and that has been added by either the cars electronics/charging system or by the audio system.

Some hint how a system should be set up. The head unit should be able to use most of its range before the amplifier is driven into clipping. Again, if the gains are set too low, the head unit won't be able to drive the amplifier to its maximum output level. If the gains are set too high, the amplifier will be driven into clipping at a very low volume level (on the head unit).

An amplifier amplifies what it is given. Your signal cables carry the audio signal, and they also carry "noise" in the system due to grounds, internal components, etc. The noise stays the same, but the signal increases with the volume. So, the higher the volume, the higher the audio signal is above the noise level; hence a better signal-to-noise ratio. Now, the amp is still amplifying the noise, but the level of the audio signal is high enough you don't notice the noise floor.

A system with an improperly set gain structure will exhibit a hiss or "static" sound at full volume playing the noise track.

Keep in mind that this adjustment does not affect the power output of the amplifier — you're simply setting the amount of input signal needed for optimum sound quality from your system.

There will be the following items checked with Track 12:

#### Test for switching noises

This test is performed using the designated noise testing track with no change to the volume. Only the source unit's (or designated) power switch is to be used to turn the system on or off. The ignition switch is not to be used. The mechanical „click“ of a relay will not be cause deductions.

**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.

**Engine on test**

With the Engine running to test noise induced by the car's charging system, mechanical or electronic system that may cause interference that is reproduced through the speakers with the audio system turned on and off.

**Possible noises are:**

Alternator whine, ignition noise, PWM-noise created by control boxes, etc.

**Engine off test**

With the Engine off to test for system noises

A 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.

If noises are audible in some listening tracks but not in the dedicated noise track, these tracks can be considered for judging.

**The following rules apply to judging noise:**

1. Each system is listened to using the “Zero Bit Track” on the current official EMMA Media for the absence of noise, if noises are heard during the regular judging, points can also be deducted.
2. The judges must listen for every specific type of noise for which a deduction of points occurs on the score sheet.
3. The judges will determine the audibility of noise from a normal seated listening position.
4. The judges should briefly note what caused any adjustment to the score in the comments section of the score sheet.
5. The charging system must be in proper working order with the alternator producing an increase in DC voltage output while the engine is running. Other than a voltage regulator, the use or existence of any circuit, switch or device designed to affect the operation of the alternator while the engine is running or physically disconnected alternators is prohibited.
6. If a cars test is clean of alternator whine, the judges may request that the charging system be tested. This test will be done at the amplifier's 12 Volt input connections. These must be made accessible within 60 seconds, upon request by the judges.
7. Alternator failures or unusually weak charging voltage will result in an automatic maximum deduction for alternator whine (6 points deduction).
8. A main power switch (could be the source unit's power switch or the ignition switch) must control the turning on and turning off of all audio system components (this does include

video systems, video games, cellular communications equipment, navigation systems etc.). In the event that a source unit lacks a conventional power switch, a single external switch can be designated to power up and down the entire audio system. Portable devices are not expected to turn off with the main power switch.

9. Electrically powered cars may compete in EMMA competitions and are exempt from rules 5-7. Deductions can be made for extraneous hums and other noises produced by an EPV's power plant according to the same guidelines used for alternator whine testing. EPV's must be self-powered during the judging process.
10. The competitor can request that the system be shut down before starting the car.
11. If the engine won't start (due to drained battery), the competitor will be offered the chance to jump-start his car 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.
12. 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 car (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.
13. Whenever a car's running engine is so loud that noise can't be checked, the maximum number of points for 'noise with running engine' will be deducted.
14. If a system is completely quiet during turn on/off test, the judges have the authority to test the system to determine whether all equipment is truly turning on and off. If any of the audio system's electronics do not power down with the source unit's power switch/designated switch for turn on/off, an automatic 3-point deduction is given. The burden of proof is on the competitor. If a competitor cannot convincingly show that their equipment is turning on and off, the 3-point deduction will be enforced by the Head Judge.

## Ergonomics

The audio system must demonstrate a good balance of comfort and safety during operation of the car. The judges must be able to operate the audio system with ease from the driver's seat without any confusion. General visibility and accessibility of the above mentioned, relevant user adjustable components from the driver's seat during theoretical operation, is desired.

CD changer units, Hard Drives, USB Devices etc. that have been installed in the passenger compartment for convenience are not to be considered and will not be a negative factor in the judge's scoring.

The judges will look for ease of system handling and a minimum of distraction from the road, as if the car was being driven. The system with the closest approximation to these conditions will receive points.

The system handling will be judged by turning the audio system power on/off, controlling the volume, track selection or fast forward/rewind controls and visibility/readability of the display only. Shrouds or covers, hiding the controls (e.g., for theft protection) will be removed and will not affect the scoring of system handling.

The judge seated in the driver's seat will operate the audio system and determine the level of difficulty or distraction in reaching the above defined user adjustable components and controls.

The following items will be evaluated:

- **System handling**
- **Visibility**
- **Control**

**Note:**

- If a steering wheel remote control is fitted, it does not need to function in all positions but for sure in the driving straight position.
- If a remote control is installed, it must have in minimum the following functions: volume, track selection, pause/mute or on/off. Furthermore, the buttons should be either labelled or a written instruction how to operate should be provided to the judges.
- The volume control used during judging is evaluated at this point.

## **5. EMMA rules - Multimedia Sound & Picture Quality**

Multimedia is the stage for those competitors who not only love great sound in their car but also the synthesis of visual and acoustic impression in the actual multi-channel formats.

This form of competition was created to meet the increasing interest for mobile Multimedia. The goal for the Multimedia category is to entertain! Multimedia judging is divided in two categories: sound & picture and installation.

### **General rules for multimedia judging**

The Multimedia sound and picture judging rules were created to separate the Multimedia judging from the regular sound quality judging as this cannot be judged under the same criteria. Careful consideration has been taken into account as not to handicap competitors without a full multi-channel system.

It's up to the competitor to choose the desired position for judging. It must be from a seat that is approved OEM seating position normally used to transport people in the car. E.g. a cinema chair in the back of a van, an extra seat without safety belt etc. are not allowed in competition.

The competitor is allowed to cover all windows reducing the level of light in the car, which will enhance the judging of the picture quality. This is permitted for both indoor and outdoor events.

Check Multimedia equipment is 'securely mounted' to the vehicle during installation judging:

Check box for MM sound / picture on scoresheet If multimedia equipment is installed and securely mounted Yes/No

The official DVD software used for Multimedia judging will be announced by EMMA. An official guideline on how to use the actual DVD together with these rules will be available for download. EMMA reserves the right to change the software during the competition season. Should this be the case, refer to [www.emmanet.com](http://www.emmanet.com) for updated information.

**The Multimedia sound judging is divided into 5 categories:**

Sound Stage and Room Quality	Max. 105 points
Tonal Accuracy and Overall Spectral Balance	Max. 115 points
Picture Quality & Multimedia Experience	Max. 70 points
System Handling	Max. 6 points
Adjustments	Max. -12 points
<b>Max. Total</b>	<b>242/302 points</b>

**Dolby Digital 5.1 on Stereo systems (2.0)**

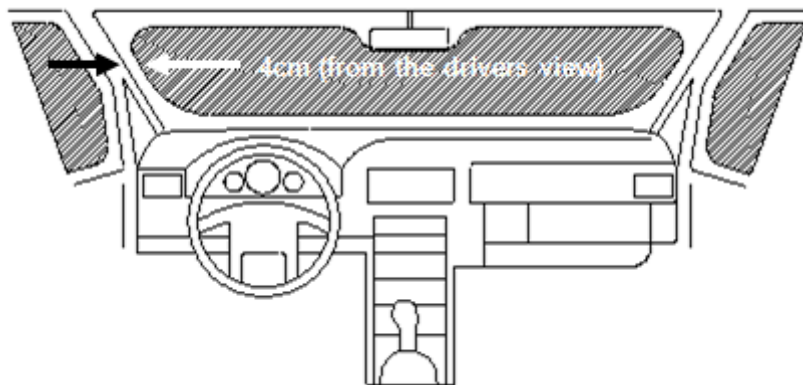
The official DVD software is encoded in Dolby Digital 5.1. In classes where the judging is done based on a stereo system (no centre, no surround speakers), the competitor must ensure, that the DD 5.1 Signal is down sampled to 2.0. Just switching of the rear system may not be enough because information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

**Checking charger connected y/n**

See SQ chapter Checking charger connected y/n" for how to check charger.

**Limited view**

The judge will sit in the driving position and check if anything from the Audio systems Installation is interfering with the view. This rule applies to the windscreen and the two front side windows. Triangular windows within the A-Pillar/ front doors will not be considered as long as the view through these windows is not higher and/or longer than half the height and length of the side window.



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

- 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)
- Covering of windows is permitted providing covers are 'mounted outside the vehicle', *(covering of windows inside the vehicle is not permitted).*

## Sound Stage and Room Quality

### 360° Level

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)

### 360° Movement

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.)

### 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 localised. 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 in 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 localised.

### 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 aligned with the picture showed on the screen, both horizontal, vertical and in depth.

You should get a feeling of “where you see is where you hear”. Look for the systems quality to reproduce a feeling of reality and being part of the action. Also consider the distance to the front stage, which idealistic should be the same distance as to the screen.

### Points are deducted if e.g.

- The screen is located low in centre console and the sound is above dashboard.
- If the centre sound and the screen is not aligned vertically. (The centre 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 to 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.

## Room quality – Surround

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).

## 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 MM 2.0 the points are only from 0 to 17 and only for the front system.

## Tonal Accuracy and Overall 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.

<b>0 – 15</b>	<b>Sub-bass</b>
<b>0 – 15</b>	<b>Midbass</b>
<b>0 – 15</b>	<b>Midrange</b>
<b>0 – 15</b>	<b>High frequency</b>

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.

For more detailed information about tonal accuracy (for music), please refer to the SQ chapter.

## Overall Spectral balance

### Overall spectral balance – normal volume

### 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

For more detailed information about overall spectral balance, please refer to the SQ chapter.

### 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, centre and surround. E.g., a dark male voice at the left moving to the centre 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 MM2.0 class the points are only from 0 to 17 and only for the front system.

## 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!

### 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.

### 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.

### Colour

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



## 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 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

## System Handling

### 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 will be in steps, not only one (1) point for each section.

## Adjustments

Please refer to the sound quality chapter for detailed information about the noise test in regards of sound

### Engine-off testing - switching noise

#### Switching noise

### Engine-off testing - System noise

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

## 6. EMMA rules – EMMA Sound Pressure League (ESPL)

The EMMA Sound Pressure League is made for those kinds of competitors who are interested in the maximum level of volume in their cars – not forgetting about a safe installation and a neat looking appearance. In all price limited ESPL classes only unmodified components are allowed. On request of the judge the competitor must give a proof that regular retail material is in use. In case of cheating an immediate disqualification will follow.

### Rules for T/B/R/W ESPL Limited categories:

- The audio system can be installed by anyone.
- The car must be registered with a license number.
- The car must have driver and passenger side seats (with back made) for automotive use and to be used for driving the car. The car must be able to drive on its own by a driver sitting in the car.
- The car must have OEM driver and passenger side doors that must be able to be opened for the dedicated measurement. It is not allowed to block or make the door opening smaller than it is as OEM. Modified door panels are of course allowed.
- Doors can be closed using only original locking mechanisms.
- In money limited classes no supercaps and no battery packs made combining lower voltage cells (LTO, AGM or similar) are allowed.
- No obstructions except OEM components between the two door openings.
- No "room in room" builds allowed. No sealed structures inside the windshield and front side windows allowed.
- Only original windshield and windows thickness is allowed.
- The maximum voltage is 14,6 Volts with the engine running, or not, measured on the amplifier's power input.
- No modified or self-built active (=power supplied) equipment is allowed (e.g. head unit, line driver, amplifier, active crossover etc.).
- A maximum of two channels of amplification are allowed per physical installed woofer (two channels bridged to one is counted as one)
- All components of the audio-system must be installed into the car – trailers etc. are not allowed.
- Only one person is allowed to run the system, no supporting people.  
EMMA will not accept anybody blocking the doors or assisting during the measurement. In this case the measurement has to be repeated and this score counts.

In a case where an external person not belonging to the competitor is trying to do so to force a second measurement of the competitor, they (and the member of a team and all teammates) will lose 100 points on any scoresheet.

#### **Additional rules for the T= Trunk classes:**

- The subwoofers (including enclosures, ports, etc.) must be installed in the trunk area, with a maximum height no higher than the top of the original rear seat (not headrests!).
- The rear seats must be lockable or fixable in OEM upright position (90 degrees or more). During the measurements the rear seats can be folded down.
- The rear seats must be usable as seats in a way as intended by the factory. Original seat height, original back rest angle, etc.
- The car must be approximate to the "original" from C-pillar to the front.
- Panel modifications (door, kick, dash, etc.) are allowed from C-pillar to front.
- The cars can be damped, but all original interior panels must fit. Otherwise they will be promoted to the category where the installed type of damping is allowed
- The source unit must be installed and fixed properly into the car.
- Sealing the trunk opening, door openings or covering any windows with hard materials is not allowed.

#### **Additional rules for the B/R- classes:**

- (R) The subwoofers (including enclosures, ports, etc.) must be installed in the trunk area (retractable rear seat must be locked in upright position). The enclosure can reach up to the roof of the car.
- (B) Alternatively, the enclosure can be behind OEM B-pillar but not higher than original rear seat back rest without headrests. (When the headrests are fixed to the backseat, then you need common sense and count them as headrests not as backseat.) The backseats must be in upright position, only from factory original is allowed.
- The car must be approximate to the "original" from B-pillar to the front.
- Panel modifications (door, kick, dash, etc.) are allowed from B-pillar to front. The cars can be damped from B-pillar to front, but original interior panels must fit. Otherwise, they will be promoted to the category where the installed type of damping is allowed. It can be heavily damped from B pillar to the back.
- A Roof-Brace ("stripper pole", max d=10cm) is allowed
- The source unit can be installed properly into the car or out of the car.
- During the measurements the backseats can be down or up, this is the decision of the competitor.
- Sealing the trunk opening, door openings or covering any windows with hard materials is not allowed.

#### **Additional rules for the W- classes:**

- The subwoofers including enclosure, ports, etc. must be behind the OEM B-pillar. The enclosure can reach up to the roof of the car.
- All sound producing equipment including Power Supply can be installed everywhere, if it does not affect the normal use of the car.
- The car must be approximate to the "original" from B-pillar to the front.
- Panel modification (door, kick, dash, etc.) are allowed from B-pillar to front.

- The cars can be damped from B-pillar to front, but original interior panels must fit except the roof liner. Otherwise, they will be promoted to the category where the installed type of damping is allowed
- Besides that, it can be heavily damped from B pillar to the back
- Roof-Brace ("stripper pole", max d=10cm) is allowed
- The source unit can be installed properly into the car or out of the car.

#### Rules for ESPL X-category and ESQ Unlimited

- No restrictions, the car does not have to be officially registered
- The car must have a driver seat with back made for automotive use and to be used for driving the car.
- The car must be able to drive on its own by a driver sitting in the car
- The car must have driver and passenger side door approximating the OEM that must be able to be opened for the dedicated measurement.
- Doors can be closed using only OEM locking mechanisms
- No obstructions except OEM components and roof brace ("stripper pole", max d=10cm) between the two door openings
- No "room in room" builds allowed. No sealed structures inside the windshield and front side windows allowed
- In ESPL Expert competitors are allowed to build bracing on the inside of the windshield and side windows. The biggest allowed size is 4cm around the window measured from the part limiting the OEM view. The size of the bracing must be measurable during judging or documented by photo log. 4cm is measured on the glass.
- All components of the audio-system must be installed into the car – trailers etc. are not allowed.
- Only one person is allowed to run the system, no supporting people.
- EMMA will not accept anybody blocking the doors or assisting during the measurement. In this case the measurement shall be repeated and this score counts.
- In a case where an external person not belonging to the competitor is trying to do so to force a second measurement of the competitor, they (and the member of a team and all teammates) will lose 100 points on any scoresheet.

#### ESPL-Judging

When judging Sound Pressure Level, it is important to have a clear notion what kind of competition this is about. Not only the absolute SPL-number should be the criteria, but also "how" the car is built. The following procedures and rules must be observed during the ESPL judging:

1. Any installed but not connected speakers will not be taken in consideration. The competitor must prove that the speakers are not connected to the audio system.
2. Installed Passive membranes do not count as woofers. The competitor must prove that they are passive.
3. The car must be shown to the public after the measurement is finished. The organisers will point out an area for presentation. In that case the cars must be presented to the public for a minimum time of 15 minutes. If the car is not presented the judge or Event Director will deduct 10 Points.
4. If additional batteries are installed, they must be properly mounted and fused.
5. The competitor is responsible for their equipment and EMMA takes over no responsibility or guarantees in case of any damage to the sound system, or the car Installation-judging:

Installation judging can be done before or after the measurement process. The competitor guides the judge through the installation of his car. The scoring will be explained immediately to the competitor.

The car's installation is not to be changed between installation judging and measurements.

#### **Measurements:**

The Event Director or Head Judge decides on the track to be used for measurement from the official ESPL-recording on the day of the event or by lottery, etc.

Only for the National Final and international Finals, the tracks that will be used will be announced in advance and published at [www.emmanet.com](http://www.emmanet.com). The measuring procedure is as follows:

1. The volume is only controlled by the owner or presenter of the competition car
2. The judges will not adjust any volume control, track selection control and head unit power switch.
3. For all ESPL, ESQ Tuning Classes the actual, designated Music Material is to be used. Additional signals are not allowed during the official measurements. The Term Lab Software will recognize the infeed of additional signals. By using additional signal the competitor will be disqualified from the competition.
4. No additional power supplies are allowed to be connected to the mains during the measurement process or any external power supply.
5. A front system must be installed and play audible music during measurement, if the front system is not audible there will be a 10-point deduction.
6. It is the competitor's decision if they sit inside the car during the judging process. EMMA is not responsible for damages to the health of the competitor but strongly recommends being careful!!!
7. Any ESPL/ESQ competitor is allowed to use an external device to operate the Audio System during the measurement procedure
8. If during measurement the head unit stops/blocks/jumps, the system, or a component of the system fails/breaks/fuse blow, etc. the competitor has a second chance to start within 5 minutes for every measurement (open/closed). The same if accidentally another track is used. There is no third chance for any reason.
9. All official ESPL Measurements must be done with the Measurement Systems licensed by EMMA
10. The EMMA ESPL tracks must be reproduced by the (car-) audio equipment.
11. In outdoors competition it is allowed to have the engine running during the measurements.
12. In indoors competitions no car will be allowed to run the engine during measurements.

#### **Measurement closed:**

The first measurement will be with the doors fully closed making the car "fully sealed" – a minimum 30 seconds of music will be played.

Within this measurement the peak SPL will be measured. Within the next 2 minutes a second measurement will follow:

#### **Measurement open:**

The second measurement will be done with only the front doors completely open – a minimum 30 seconds of music will be played with the same track as in the first measurement. Within this measurement, the average SPL will be measured.

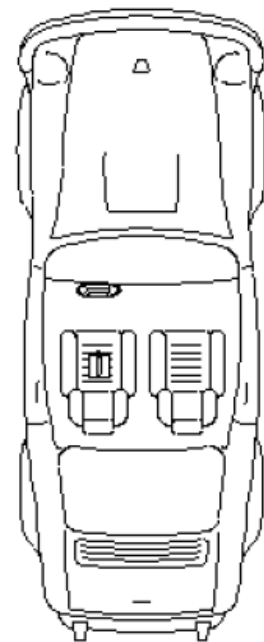
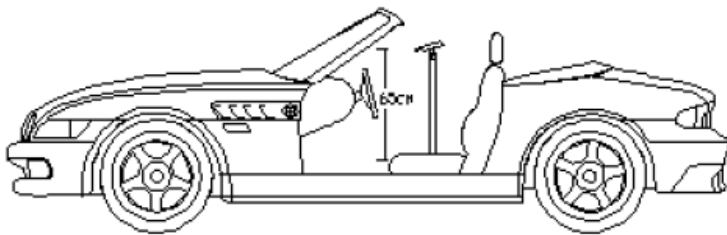
#### **Sensor placement:**

The microphone/sensor will be placed by an authorised judge and the competitors are not allowed to touch it in anyway, during and between both measurements. The sensor must be placed before the b-pillar.

If the sensor cannot be placed before the B-pillar, the sensor placement defines the line of a virtual B-pillar where the subwoofer enclosure (Box, port, subwoofers...) have to end in horizontal and vertical axis. The judges must ensure that the microphone height and orientation are absolutely consistent from car to car.

**The following guidelines apply for using a microphone**

1. The driver's seat must be positioned to a reasonable driving position of the competitor (driver must be able to operate the pedals, steering wheel, gearbox and see the gauges on request of the judge).
2. The backrests of the seats are not allowed to be tilted towards the steering wheel, should be at least in vertical position (90 degrees or more towards the back).
3. The Omni-directional Microphone/Sensor in the centre of the driver's seat, 65cm above the seat, oriented on a level horizontal plane towards the dash of the car.
4. This referred to as the "standard position"



The cable of the microphone/sensor must be routed through the original door opening by the judge. No special devices are allowed. No other equipment than the official measuring equipment, cables etc. are allowed to be used.

**Optional for ESPL**

The Event Director can decide, before the competition starts, to have a qualification round and a final round. If the decision is made to have a qualification and a final, two tracks will be elected. The track for the final will not be announced before the final starts.

### The Qualification

Installation, measurement open and closed as described above. The results will be added together. The best, four to eight competitors of each class are qualified for the final round.

### The Final

The measurement modus is the same but with another ESPL track. The installation points will be carried over from the qualification round.

The number one of the first round will compete against the competitor who finished last in that same round, the second against the seventh, the third against the sixth, and the fourth against the fifth-place qualifiers. In the semi-finals the first will compete against the fourth, and the second against the third.

The final follows with the two winners of the semi-final against each other.

If something is not covered in these rules, the general guidelines of the official EMMA rulebook are to be used. In each event the Head Judge or the Event Director is the highest court of appeal, and their decision is final.

## 7. EMMA rules – EMMA Tuning

The EMMA Tuning concept is based on a competition in which all aspects of car modification (styling, tuning and audio) are judged. It is like a motor sport event, in accordance with the rules and regulations approved by the national authorities in the organising country, and the international rules approved by EMMA.

Each event is run under the EMMA Banner, and the organiser of the competitions will be a licensed EMMA Partner. The judging will be performed by judges that have been approved by either the national or international EMMA organisations.

### The Event Schedule

The registration of the competitors will be done in accordance with the EMMA rules. The different sections within the competition are as follows:

- Installation
- Interior
- Trunk Compartment
- Tuning Technical
- Tuning Design
- Paint Job
- Sound Quality
- SPL

#### Presentation Documentation of modifications

Invisible modifications must be documented by a photo log or according to papers from the tuner. Otherwise, no points will be awarded.

## Installation

The installation portion of the judging process is simply looking at the car audio side of the build and is judged in the same way as the normal audio installation process but with only the following aspects:

- Presentation to the public
- Cleanliness
- Main fuse present

## All Components fused

Fuse value appropriate to cable size (Custom only)

## Interior

This section judges the overall interior of the car. Each section is broken down starting with Craftsmanship & Design. This is the first impression of the installation. Points are awarded for effort and execution of the installation, unless there is specified criteria set out in the judging book.

Craftsmanship and design	
Dashboard and door skins	(Custom only)
Seats	
Foot room	(Custom only)
Roof	
Interior Lighting	

## Trunk Compartment

This section judges the overall Trunk of the car each section is broken down starting with Craftsmanship & Design. This is the first impression of the installation. Points are awarded for effort and execution of the installation, unless there is specified criteria set out in the judging book.

Craftsmanship and design	
Modification	
Surface changes	
Lighting	
Features	(Custom only)

## Tuning Technical

This section judges the aftermarket modifications used to increase the performance and handling of the car and is judged based on level of effort or increase in performance. Points are awarded for effort and execution of the installation, unless there is specified criteria set out in the judging book.

Power of engine	(Custom only)
Brakes	
Drive Train	(Custom only)



Oil and Water Cooling	(Custom only)
Air Intake System	
Exhaust System	
Chassis suspension	

### Tuning Design

This section judges the aftermarket modifications used to enhance the visual aspect of the car and is judged based on level of effort and execution.

Points are awarded for effort and execution of the installation, unless there is specified criteria set out in the judging book.

Craftsmanship and design	
Rims & Tyres	
Spoilers & body kits	(Custom only)
Window & Glass	
Custom detail work	(Custom only)
Lights	

### Body work finish

This section judges the body work and finish on the car used to enhance the visual aspect of the car and is judged based on level of effort and execution.

Stock + OEM paint work is judged to show and shine standards

Custom will be judged on custom detail work with addition features

Points are awarded for effort and execution of the installation, unless there is specified criteria set out in the judging book.

OEM Paint – show and shine	(Stock + only)
Craftsmanship and design	(Custom only)
Special Features	(Custom only)

### Sound Quality

The rules for judging this section are the same as for full SQ, as described previously in the official EMMA rulebook with a scaled down points system as per the breakdowns below

#### Imaging Characteristics

- Stage Width

#### Sound Stage

- Distance to sound stage
- Stage Height

#### Tonal Accuracy

- Sub-bass
- Mid-bass

- Midrange
- High-Frequency

### **Listening Pleasure**

- Listening Pleasure

## **8. EMMA-rules - EMMA Sound Quality League (ESQL)**

The ESQL competition was formed by EMMA Philippines and EMMA Thailand to open a competition arena for those who enjoy listening to good sound quality outside their cars and like to entertain themselves and the people that surround them.

### **The competition consists of**

- checking the installation
- judging the sound quality outside of the car

On larger national events the categories can be further divided if required, e.g., as following:

- ESQL Limited (can be divided by e.g., Trunk 2W 4W)
- ESQL Unlimited (can be divided e.g., by W and B/R Unl)

The rules for classification are the same like for ESPL described in the section in the official EMMA rulebook.

### **Installation**

The installation portion of this category is judged just as per the standard EMMA installation rules according to ESPL/ESQL rules

### **Sound Quality**

Before starting the judging procedure, the competitor has a 5 minute preparation time to set up the system. During the judging no changes on setups are allowed. The tracks to be used for the SQ judging procedure are the designated tracks for Tonal Accuracy and Spectral Balance of the official EMMA recording.

The Sound Quality Judge(s) should stand between 5 and 15 meters from the car, the exact distance is the decision of the competitor. If the competitor does not advise the judges to keep a defined distance the distance will automatically be 5 meters. The position of the judges is decided by the competitor and does not necessarily need to be behind the car.

After the judges discovered the Tonal Accuracy and Spectral Balance according to the SQ-rules, the competitor is free to choose a track of his own for the judging of Listening Pleasure and public entertainment.

At this point the competitor has a maximum of 2 minutes preparation time to setup the system.

The length of this additional track is limited to 5 minutes unless otherwise announced in advance.

The SQ judges will also score points for public entertainment.

Public entertainment will receive a max. of 6 points, where the competitor can earn a max of:

- points for originality
- points for effects and coordination
- points for overall effort.

**Important note:**

In case of too loud reproduction of the SQ tracks the judges are allowed to reduce the volume level.  
In the event of a tie the following rules are valid:

1. The higher score of Tonal Accuracy and Spectral Balance.
2. The higher score of all SQ scores
3. The higher score of listening pleasure
4. The higher score of public entertainment

EMMA is powered by:

## 9. General competition rules and procedures

### General

**For all EMMA authorised events, only this rulebook and the affiliated media to be used.**

As a general rule in regard to specific items, when not written and/or addressed specifically in this rulebook and the affiliated judge books, it will be judged illegal until otherwise specified by the EMMA Rules and/or Head Judge Council.

Amendments will be made to these rules, policies, and procedures in accordance with the changing times of our industry. Any addendum to the Rulebook will be published on the EMMA Homepage – [www.emmanet.com](http://www.emmanet.com) - and accompany the actual version of the rulebook replacing or clarifying paragraphs if necessary. In this case, the updated paragraphs written in the latest addendum will be classified as the updated actual version of the rulebook and will be valid from the day of publishing.

The following policies, procedures and rules have been formulated to benefit all competitors, officials and judges at EMMA sanctioned events. Many manufacturers, retailers and fellow competitors established these rules and guidelines through many hours of research for the purpose of fair, unbiased judging standards. Because it is impossible to foresee every circumstance, or combination of circumstances that may arise during an event, it will be up to the discretion of the Head Judge, Event Director and/or the Head Judge Council to address any of these circumstances or concerns when they arise.

The Head Judge or the Event Director at the event will outline the circumstances or concerns (regarding the rulebook) and forward them to the EMMA office for administration and forwarding them to the Head Judge Council for review and measures.

The Head Judge(s) and/or Event Director must clarify judging discrepancies on the day of the event, while the information is still fresh in everyone's mind and the system can be checked to determine the proper course of action. Discrepancies resolved by the Head judge will be forwarded to the EMMA office.

All communication during an international event will be in the English language. Whether it is in presenting one's car, give/receive feedback, file a written protest, announcements or otherwise.

When necessary, a competitor is allowed to use an interpreter. Using and providing of an interpreter is the sole responsibility of the competitor!

The international Head Judge Council is a (flexible) group of Head Judges & Supervisors that work on the most actual version of the rulebook / judge books take measures if concerns or circumstances are reported and support active judges in international competitions.  
It is the highest possible institution for decisions within the EMMA competitions.

**These General Rules apply to ALL competitions organised under EMMA rules.**

## Registration

1. Any legal person is allowed to participate in EMMA events. This can be a “natural living male or female or other” person, a group of persons or a legal entity that can act as one. This includes associations, foundations, establishments, companies etc. In no way is only one “natural person” meant. In the rest of the rulebook he, she or they will be called competitor.
2. The car entered in the competition must be (temporarily) registered (except Expert or X Unlimited Class) and allowed to drive.
3. All cars must provide a legal or valid registration / ownership documents on request to verify car ownership.
4. Cars must be registered in the competitor’s name or business name, or it must be proven that the competitor is the main user of the car on request.
5. The car that is registered to compete must be present at the location of the competition and available to the judging process within the announced times. Otherwise, the registration is not valid.
6. Any falsification or misrepresentation of entry registration information regarding participant, car and/or mobile media system, can be cause for immediate disqualification. The individual could be banned from competition for the balance of the competition season by the national organisation or EMMA.
7. The competitor registration form must be filled in completely via the internet in advance or by hand on the competition day with the requested information (certain national organisations might only accept registration over the Internet), such as but not limited to:
  - Complete name
  - (Mobile)Phone- and if possible, E-mail address
  - Car information (manufacturer, type, colour, registration number)
  - Category and class in which the car will compete
  - Manufacturers of all installed components
  - Date and location of the event (a registration form must be filled in for each event separately)
8. The registration fee must be paid to the organising before the event begins. The fee will depend on the national organisation’s rules. In some cases, the competitors will be asked to wire-transfer the money to the account of the organisation in advance of an event to confirm attendance.
9. One competitor can participate and qualify in a maximum of five different formats during one event with the same car:
  - One class in Sound Quality
  - One class in Multimedia
  - One class in ESPL
  - One class in ESQ
  - One class in EMMA tuning

10. A competitor may enter more than one car in one event. Qualification points will be only awarded to the competing car in the category/class it is competing in.

### Conditions of Entry

1. Please follow the description under the chapter "Categories and Classes".
2. All cars must be roadworthy and legally registered to drive on public roads (except ESPL Expert & X Unlimited). When in competition, all of them must be in a roadworthy form/ready to drive state (e.g., pedals and steering wheel etc. must still be attached).
3. All cars must enter the competition area by their own engine (e.g., petrol, diesel, electric, fuel cell etc.).
4. A competitor must register in the appropriate class according to all active components installed. (Note: If a discrepancy between the value of the car audio system or number of woofers reported during registration is determined after judging has been completed, the competitor may be disqualified. It is up to EMMA to accept or refuse the price for components given by the competitor by a comparison with the EMMA value database at: [www.emmanet.com/value](http://www.emmanet.com/value). In the case of not accepting the given value it is up to the Head Judge/Event Director to dismiss the competitor or to upgrade the car to other categories/classes).
5. The audio system can be installed by a professional installer (valid for all classes!).
6. The use and installation of equipment produced for mains electric power (e.g., 220 - 240V) is only allowed for other devices. In case of Multimedia, Screens/projectors intended for home use are accepted.
7. Active judges at an event are allowed to participate with their car but they cannot judge the same category/class.
8. A Head Judge/Event Director is allowed to compete in the event they oversee. If this is the case, the legal power for the class they compete in is transferred to another qualified (Head) judge.
9. Professionals are defined as related to, employed by or otherwise affiliated with and/or has not received financial support or other compensation from any manufacturer of audio equipment or publisher of auto sound material, retail dealer or other representative of the mobile electronics and related magazines.  
Judges according to the classification rules are defined as active judges of any auto-Sound organisation or sanctioning body.

### On the Competition Day

1. The competitors must be at the registration before the announced time. (e.g., 9.00, the times mentioned are an example and may vary). If they have not registered within the next 30 minutes (e.g., until 9:30 h) there will be a deduction of 10 Points written on their score sheet (signed by the Head Judge/Event Director). Additionally, after 60 minutes (e.g., 10.00 h) the competitor will only be allowed to compete if the event director decides so due to a reasonable explanation.
2. All cars must drive into the judging area by using their own engine. In case of engine trouble on the way to the event, the organisation must be informed as soon as possible. The Head Judge or the Event Director can decide in this case whether to deduct points or not (in SQ for engine on testing, in other categories 30 points). The judging area is defined as the designated location for SQ-cars on the event (e.g., hall #5) and for ESPL- & ESQ-cars the locations for installation judging and measurement (might require driving with own engine between installation point and measuring point).

3. After registration, the competition cars must be in the designated areas, instructions from the organisation/staffs have to be followed.
4. The car entering the judging area must be accompanied by the person showing the car and no more than one co-pilot. When a competitor and their co-pilot are in the judging area, they must follow all instructions pointed out by the judges, Head Judges, and officials of the organisation.
5. Before the beginning of the judging process, the Head Judge will invite judges and competitors to attend to a briefing. If an EMMA event is held over a two-day period, the organisers/national organisation decides which classes start on which day.
6. When the judges want to start their work, they will inform the first competitor of the day and the car must be prepared for judging within five minutes. In case of a time schedule being used – the car has to be ready for judging one hour before the determined time or, in case of judging order used, two cars before the actual judge. If the competitor is not available when the judges show up for judging, 10 points may be deducted.
7. Before the SQ/MM/ESPL/ESQL-judging starts, the judges will give the judging media to the competitor and allow them in max. two minutes to check the settings of the system. It's the competitor's responsibility to assure the proper DSP setting, that all speakers work properly, etc. The system will then be judged under those conditions.
8. If a competitor feels that an equipment malfunction or operator error resulted in a score to be questioned, they have the right to bring this to the attention of the judge (team). It is up to the Head Judges/Event Director if a re-judging will be permitted or not.
9. Active judges in this competition are not allowed to adjust or prepare any competition car (except their own if they are competing) during the event. This will lead to a deduction of 10 points to the judge's car as well as the competitor's car the judge was in.
10. During all events it is always possible to send out 2 or more judges per category/class, even if it is stated otherwise in the rulebook. This decision must be announced before the start of the event.
11. The installation is not allowed to be changed between the installation and sound judging (i.e., remove covers, apply damping, remove grilles, etc.). Disregard of this may lead to 0 points in the relevant installation section after reviewing this issue with the Head Judge.
12. In some events, a prestaging can be required.
13. During prestaging, an assigned event official will verify the registration and/or the competitor information section on the score sheet. This includes verifying the registered category and class. If the competitor category and class is questioned, it is the responsibility of the Head judge to determine the appropriate category and/or class for this event only.
14. An official inspection person or the appointed installation judges have the option to inspect each competitor's car to verify the information supplied under car information and the system description at any time of the competition.
15. During an inspection procedure, the official performing the inspection reserves the right to require a competitor to disassemble their audio system installation or elements of their car, within reason, to verify the competitor's submitted equipment list and/or value of car audio system. Failure to comply with inspection will result in the forfeiture of all prizes awarded and disqualification. In all cases, the decision of the Head Judge, the EMMA Supervisors, the Head Judge Council, or the EMMA Directors are final.
16. If any damage should occur to the sound system or car during disassembly, it should be immediately reported to the Head Judge.
17. EMMA is not liable for damage or system failure occurring at or during an event.
18. In the case of ties / equal points of competitors in the same class, the following rule is applied for ESPL:
  - i) The competitor with the higher value for measurement closed finishes in front of the other
  - ii) If even the measurements closed are equal, the competitor with the higher value for measurement open finishes in front of the other

19. The following rule is applied for SQ:

- a. Higher points in SQ rules over installation
- b. if even SQ points are equal: the car with the higher points in tonality wins.

## Event Types

### Regional event

A regional event can be organised by a retailer, a manufacturer, or another accepted association. During this event there must be a minimum of one official Head Judge and one SQ and installation judge team each. Regional events are to qualify for the yearly national Final.

Competitors are more than welcome to pick up the idea of the international community and start in competitions in other EMMA-member countries! With their attendance, an account to earn qualification points is opened in the country they started in.

### National events

A national event (e.g. the final) can only be organised by a national member organisation of EMMA, or by EMMA itself. National finals can only be organised with the official permission of the EMMA office. Participants of the national final must have qualified at regional events/international events. It is suggested that the 10 competitors with the highest qualification points gathered over the season will be qualified for the final. The national organisation is allowed to adjust the number of qualifiers for the finals. If international competitors are qualified for the national finals and participate, they can win. But they cannot become national Champion in any other than their home country. During a national event there must be, besides sufficient judges, a complete authorised Head Judge team and an official EMMA Event Director.

### International event

International events can only be held with the permission of the EMMA International office. EMMA will work strongly together with the organising National Association and is responsible for delegating the Event Director, Head Judges, and the entire judge team.

Participants for an international Championship (e.g., Asia Finals, Euro Finals) must qualify before and must start in the same category/class they qualified in. A change of car or Category/Class is not possible.

It is no longer allowed to qualify for a continental final in another country than the country of origin.

The qualification can be accomplished either by being in 1st or 2nd place on the Finals of a national organisation or – if the finals are held too close to or after the international Championship – the first competitor of the national points table will qualify. Exceptions must be approved by EMMA headquarters. The maximum number of competitors per Nation will be announced at latest three months before the international final.

In any case the national organisation must nominate the participants with their data for the international championship 4 weeks before these finals at the latest to allow EMMA the organisation of the event.

It is the responsibility of the national organisation to assure sending only competitors that qualified themselves for the international championship and that they are in the correct class as well as – where required - that the value of the equipment is within the limits according to the EMMA-value-database!

A maximum of three competitors for one class from one Country can sign up for the Continental finals.

**Note for categories in Sound Quality and Multimedia on national or international events:**

If there are more than 14 competitors in a class, the national organisation (or on an international event like the Euro finals EMMA - International) can decide to separate this class by splitting the class in 2 groups and have the best 3 of each group judged by a new judge team to determine the places 1-6. As an alternative all cars can be judged by the same team within two days and the best six of this can meet again in a final the following day judged by another team. Places 7, 8, 9 ... will be determined according to the points achieved on the first evaluation.

### Qualification points

For the qualification to the national finals, the following points will be awarded to an account for the competitor in conjunction with his competition car and the category/class he was competing in with it.

1st place	10 points
2nd place	8 points
3rd place	6 points
4th place	5 points
5th place	4 points
6th place	3 points
7th place	2 points
8th place	1 point

Qualification points are awarded to a Person-Car-Class combination. If anything in this combination changes, the points are void.

Whenever a competition is labelled as an EMMA International Event, the qualification points earned there will be added only to the competitor's national (home) account as qualification points for the national final. If no account is opened, the national organisation must then open it.

The points awarded in the events will be accumulated and maybe published on the official national EMMA website.

### Wildcards

Any EMMA association will receive three wildcards per year. For any event more than five per season the National EMMA Affiliate will receive one wildcard per each additional event above that five. Only events that have been added to the official international event calendar at [www.emmanet.com](http://www.emmanet.com) at latest 14 days prior to the event will be taken into consideration. A maximum of three competitors for one class from one Country can sign up for the continental finals. Competitors receiving a wildcard must have been competing during the season at least one time in their home country. The number of wildcards is limited to a maximum of 12 per Nation. It is no longer allowed to qualify for a continental final in another country than the country of origin. Further wildcards can be given to competitors from Nations that have no regular EMMA Sound Off events. EMMA Global must sanction all wildcards.

### Etiquette

1. No other than an EMMA Head Judge/Event Director or authorised official may look at any scores on any score sheet or judge's safety sheet during the competition.
2. Competitors are permitted to see their install score sheets and to receive an explanation of the judges, which will take a maximum time of 5 minutes. The scoring is not to be discussed. The competitor will sign the score sheet after explanation of installation judging.
3. On non-final events, competitors are permitted to see their SQ score sheets and to receive an explanation of the judges, which will take a maximum time of 5 minutes. The scoring is not to be discussed. The competitor will - in this case - sign the score sheet after explanation



of SQ judging. On any finals, SQ-scoring will not be explained, and the competitor is not requested to sign the score sheet.

4. By signing the score sheet, the competitor accepts the scoring and waives all rights to file a protest.
5. Furthermore, the signed score sheet is a contract between EMMA and the competitor that can (in case of a failure) only be changed between the Head Judge and the competitor by signatures with the knowledge and approval (signature) of the Event Director.
6. If a competitor is required to sign a score sheet and refuses to sign it on national or international events, the car will then be locked, and the Head Judge will be informed. A small protest form will be available to be handed out by the Head Judge if requested.
7. In general, the competitor has three choices: sign the score sheet (when so required), file a protest or withdraw from the competition. If necessary, the Head Judge will be called to clarify the situation.
8. No competitor or Judge may discuss actual scores of any other car or system with any competitor at any time prior to the trophy presentation.
9. After judging of the car, the competitor must immediately exit the judging area if so required.
10. Any competitor caught cheating during an event will be dismissed from the event. The EMMA office and Head Judge Council may review the incident of cheating (even when the event is over)
11. Repeat offences or cheating can be cause for loss of all, or part of accumulated points that can be earned at EMMA sanctioned events and for a possible disqualification from participation in all future EMMA sanctioned events. In extreme cases the EMMA office will make the name of the cheating competitor public.
12. Abusive language or misconduct on the part of competitors or Judges will not be tolerated and may result in dismissal from the event, as well as forfeiture of event registration fees for compensation.
13. It is the responsibility of the Judges and the competitor to make sure that nobody looks at the score sheet other than the competitor themselves during explanation. Competitors who try to look at another score sheet (or have somebody do that for them) can be punished with 5 points deduction.
14. Anyone interfering with the judging process will get a 5-point deduction or may be removed from the event at the discretion of the Head Judge/Event Director (this also includes team leaders etc.).
15. Indecent or inappropriate behaviour can lead to the exclusion of the competitor from the competition by the Head Judge/Event Director, in severe cases from all competitions of that year or forever by the national EMMA organisation. In worst cases a competitor can be banned by EMMA headquarters from competing in ANY EMMA competition.
16. During the event all alarm systems must be turned off. If the alarm system is triggered and the competitor does not immediately turn the alarm system off, five points will be deducted by the Head Judge.
17. The use of interior horns is absolutely prohibited during EMMA competitions and leads to immediate disqualification of the competitor.
18. Judges will not comment on following points, even if requested by the competitor:
  - Position angle of the installed speakers
  - Sound Setups of the Audio System
  - Used Brands
19. The competitors can expect the Judges to:
  - Be polite to the competitors
  - Wear EMMA sanctioned clothing
  - Give a fair and unbiased evaluation to all competitors

- Have undergone proper education to be a Judge
- Give the competitor feedback about the judging result (exception on final events)
- EMMA Head Judges are not allowed to be part of organizations competing with EMMA.

### Protests and Tear downs

1. Scores are defined as any points that are placed on a score sheet. This includes objective measurements as well as subjective observations. If a competitor feels that a Judge has intentionally or unintentionally given a score that is incorrect or not consistent with intended interpretation of the current rulebook, the competitor can protest the score. To prevent trivial protests, the protesting competitor must accompany their protest with a risk of losing 30 points, which will be deducted from the actual score sheet. If the score is deemed incorrect, the deducted points will be returned to the protesting competitor. If the score is deemed to be correct, the protesting competitor will lose 30 points on their score.
2. A competitor should understand that if a protest is filed that questions a particular Judges subjective judgement, it could only be resolved by that specific Judge. It must be verified that they are comfortable with the score issued and have a complete understanding of the rules as they are written and interpreted. A subjective judging section score cannot be re-judged nor be re-scored by any other Judge or the Head Judge. If the Head Judge found an incorrect score, they will take proper action. In case of re-judging, obvious items in the install-section like loose equipment, wrong fuses, etc. or in the sound/picture section like noise, etc. will not be changed because these may be changed by some competitors prior to the re-judging leading to another picture other than in the original process.
3. A competitor can also doubt the fair play of another competitor. This may include the incorrect value of car audio system woofers and/or competitor category classification, suspected cheating, or falsifying competitor information. This protest can result in a tear down or objective/subjective re-test of the protested competitor's car. This challenge can only take place on the day of the event and at the event site. Should a competitor challenge another competitor's car and should the Head Judges/Event Director determine that the tear down or objective/subjective re-test is necessary for verification, the contesting individual must accompany their challenge request with 30 points of their actual score. Should a violation be discovered in the contested car, the 30 points will be returned to the challenger; and appropriate measures will be taken regarding the violation. However, should no violation be discovered, the protesting competitor will lose the 30 points on their actual score.
4. Only a competitor in the same class, registered in that event, may request a tear down. Any non-competitor or team leader who protests or attempts to protest on behalf of a registered competitor may, at the Head Judge's or Event Director's discretion, have themselves and the competitor (team) they represent removed from the contest.

### Request Procedure for Protests/Tear downs

1. The competitor should point out any score that they feel is incorrect immediately after the judging process (!!!) to the Judges. The Judges will contact the Head Judge or a designated Control Judge. If the Head (Control) Judge is comfortable with reasoning behind the protest (logical analysis of the score) the Head Judge can permit the competitor to file a protest. Without this permission, NO protest can be filed!
2. An official protest must be in writing and will include the appropriate point's deduction by the Head Judge. The competitor should specify what is being protested and include their opinion of what the score should be based on this rulebook. Filing a protest 'because the

scoring is too low (e.g., lower as in the last competition attended, etc.) will not be accepted. In case of multiple problems with the scoring, multiple protests need to be filed, each with 30 points deduction. The official protest is lodged with the Head Judge. Only the official protest form may be used and must be handed to the Head Judge or Event Director within 30 minutes of the judging being finished.

3. The Head Judge will discuss the protest with the concerned judge team and the second Head Judge. In case of no solution being found by the two Head Judges, the Event Director will decide about the protest. Event Directors must be actual Judges. If not, an experienced Judge out of the present Judge Team will be asked for their decision and the proceedings will be forwarded to the Head Judge Council.
4. The Head Judges/Event Director will make the decision on the protest at the contest. The decision of the Head Judges/Event Director is final; prize giving ceremony will take place.
5. It is the competitor's right to send their protest to the EMMA office. The EMMA office will forward the protest to the Head Judge Council. The Council may review the Head Judge's/Event directors' decision but there can be no change of the result in any way.
6. Requests for a tear down must be submitted on the day the class is being judged and a minimum of 4 hours before the prize giving ceremony begins.

#### **Procedures and rules for / during the Installation Quality Judging:**

1. Maintaining a detailed photo log will assist in the inspection process of the installation judging and in answering many of the installation judge's questions.
2. It is the registered owner's/main user's responsibility to explain the sound system installation to the judges in the absence of appropriate documentation. In a National or European Championship, the registered owner/main user must explain their car in person; otherwise, the judges will award 0 points for system presentation:
3. The competitor will be given up to 7 minutes to explain their system, installation, and the ideas and point out any special elements of the car's mobile electronic installation. If a translator is required, the time will not be extended. In this case, the competitor is only allowed to speak in his native language. The only exception is X unlimited, where the time will be 15 minutes max. for the presentation.
4. The judges will politely inform the competitor when the presentation time starts. They will never interrupt the competitor during the presentation time. The judges will politely inform the competitor when the time has expired. Judges are allowed to stop the presentation immediately after the time explained above are up.
5. The competitor will be politely asked if the installation is of the same status like for SQ (no changes allowed). A checkbox on the installation sheet will document if so yes or no. Disregard of this may lead to 0 points in the relevant installation section after reviewing this issue with the Head Judge.
6. The competitor should stay close to the car until the judging process is complete. The competitor should not interrupt or disturb the judges unless asked by them to answer a question or to explain a system element.
7. The judges will show the score sheet to the competitor and explain their scoring to the competitor after finishing the judging. This should not take more than 5 minutes. When the time is over and in case of further questions, they can refuse the explanation.
8. After the competitor has seen the score sheet and accepted the result, they should sign it. A protest must be made immediately after the explanation of the judges. No protest regarding their scoring is allowed once the score sheet has been signed.
9. Judges should not use force when judging securely mounted components. It depends on what component is being checked according to the weight of it (e.g., a tweeter in the a-pillar doesn't have to be fixed as tightly as a subwoofer to its box in the trunk).

10. The method for fixing doesn't matter if the component is properly secured (e.g., could be screwed to a wooden plate or glued as well as welded to a steel plate). Note: OEM fuses or original fuses of aftermarket components within the original wire harness need no special mounting if not foreseen by the manufacturer.
11. Grills or any other protective elements will not be checked for proper fixing.
12. If a head unit with detachable faceplate is installed, it might be that the faceplate/detachable part have some play. If so, the judges will take away this part and check the installation of the remaining unit.
13. External devices, which can play the EMMA recordings, must be turned off or disconnected during the judging process, otherwise these devices will be judged as part of the audio system. This must be proven by the competitor. The same rule applies for rear seat entertainment systems.
14. If a component is attached to a factory (original) panel and this panel is not properly fixed, points will be deducted (e.g., tweeter mounted to panel fixed with clips could be a bit loose)
15. Grills or any other protective elements and covers without mounted components will not be checked for proper fixing.
16. Only the speakers actively producing sound within the audio configuration will be judged.
17. Protective bars with less than 3 cm gaps will get no deduction.
18. Speaker Phase plugs cannot not be used as a protection element.
19. Grill clothes with high tension but no support underneath is not considered as sufficient protection and will get points deducted.
20. Speakers, which are installed inside enclosures (and are not touchable) or with the baskets on the outside of the enclosure, do not need separate protection.

### General rules for Sound Quality Categories and Classes

Sound Quality competitions are held to determine who has the best sounding car according to the rules in this rulebook. To make sure that the right people compete against each other, categories with an ascending level of difficulty have been created.

The difference between the categories is the amount of judging that will take place. In the "lowest" category only a few elements of the total Installation and Sound-score available will be judged. As the competitor progresses through the categories, more and more elements of the Installation and Sound will be judged. It is up to you, the competitor, to decide in which category to start (it's possible to change categories up or down, except back to the "lowest" category). With this system the competitor can increase their knowledge about the mobile media system in the car.

How does the judging work? Both sound and installation are judged by set criteria. There is only one list of judgement criteria, and the higher your experience (and your category), the more criteria will be judged. Following these rules, when a competitor who was competing in a higher category decides to compete in a lower category, they will NOT have any advantages against others, because one or more criteria will not be judged in this lower category. In simple words: An expert unlimited car must not necessarily win in any lower category!!!

The categories themselves are divided into classes, depending on the value of the car audio system.

### Music reproduction

EMMA provides all Audio Tracks used for the judging procedure only in digital formats as download at the webshop under <https://www.emmanetshop.com>. The Audio files which must be downloaded from every single competitor includes several high-resolution formats such as wav and mp3. It is up to the competitor what file they will use in the competition. Every competitor must provide a hardware connection to their Audio System on request to give a possibility to the judge to use the

original audio files for the judging procedure. This shall guarantee a fair comparison between the competition vehicles by using the genuine original data. Furthermore, every competitor on national and international finals must be able to show a proof of legal authorization of the files to be used in the competition. This can be done by showing a copy of the receipt each customer receives together with the download for the official EMMA Webshop. Competitors using modified or copied files might be immediately banned from any EMMA sanctioned competition.

**Note:** All EMMA tracks are under the copyright of EMMA GmbH and any copy without authorisation is illegal.

If it is necessary, that the files for judging must be loaded to the competitor's device the files must be loaded to their storage device under the observation of an official EMMA representative or Judge. The competitor is forced to give this information during the registration procedure. The EMMA staff will offer a location, a time slot and Various hardware like USB, SD, Laptop. All other necessary components must be brought by the competitor. EMMA may keep the storage device until judging process is finished. EMMA shall not be liable for loss or damage.

Streaming of media is allowed for the judging process. The streaming device does not have to be fixed into the car (if not used for operating the tracks) but the device that the judge is operating the streaming device from must be secured.

### **User interface, mostly called head unit in the rulebook**

Device to operate the system. The user interface should be installed to the car (it is possible that a handheld device may also be the user interface in that case), the competitor must proof that handheld device can be securely mounted for the use while driving. This will be the status EMMA judges the car in SQ & MM. in ESPL & ESQ & Tuning, the competitor must proof that handheld device can be fixed.

#### **Examples:**

- could be the storage device if e.g., a smart phone is used
- or the OEM-Head Unit that is remote-operating another device
- other device (streaming client, D/A converter, could be the storage device and user interface if e.g., a smart phone is used)
- (To be considered for money limited category)

#### **Remote control:**

- additional user interface
- (To be considered in money limited category)

### **Money limited classes**

In some categories money limited classes are available. The respective national organization is responsible to verify that the competitor starts in the correct category with the help of the EMMA-value-database.

The total system price is the sum of all non-binding retail price recommendations of the manufacturers (even if they are used or "old") and includes all electronic material (the source unit, processors, active crossovers, amplifiers, all speakers etc.).

Please note again: All devices which are used to reproduce Media content for a competition car will be taken into the calculation of the total system value. As soon as the device is necessary to reproduce and adjust the content it will be calculated the same way as all other active components! Storages like hard drives, USB Sticks or SD Cards are not taken into consideration and seen as "passive" components.

All mounting materials (cables, mounting boards, passive crossovers, fuse blocks, batteries [except additional batteries in money limited ESPL classes], capacitors etc.) are not included into the total sum.

To provide an equal basis, EMMA is using a database available to all national organisations defining the value of any component. The Database is available online at <http://www.emmanet.com/value>

For the calculation of the correct component value on national and international events, EMMA Europe provides access to the official EMMA Value Database at [www.emmanet.com](http://www.emmanet.com).

If the competitor uses products not within the database, the competitor must contact their national organisation, provide the necessary data, and the national organisation will contact EMMA Europe to get the EMMA Value Database updated. If products will be used that are not available on the European Market, the competitor must prove the retail price. If this is not available an equivalent value of a similar product available in the European Union will be taken as reference.

Equipment used at an international Final must be written down in detail and sent to EMMA for authentication and verification prior to the event. The EMMA value sheet must be shown to the Judges at the registration desk.

If a competitor decides to use the factory installed components, those values will be added according to the value data base.

#### **Some Examples how to handle for money limited categories:**

##### **1. Example:**

Use EMMA CD in Head Unit

storage device is CD => not taken into consideration at all

Head Unit = User Interface = must be calculated according to value data base

##### **2: Example:**

Storage device (1), controlled by an app on iPhone (2). And "apple CarPlay" OEM head unit (3) is controlling the iPhone. Signal goes from storage device to amplifier.

(1) Storage device = not taken into consideration at all

(2) iPhone = is not the "remote control" but the user interface => must be considered at its retail price. This is valid for any smart phone.

3) OEM-Head unit, using CarPlay = this is in that case not the head unit of the system nor the user interface = it is the remote control of the iPhone=> must be calculated with the appropriate value

#### **Changing Categories/Classes**

A competitor who elects to change class and/or category during the competition season must compete at least once in the new class and/or category within the same season to qualify for invitations to the national final. All qualifications reached before expire with this change. A change of category and or class after the national final disqualifies the competitor from the international Final. It is the duty of the national organisation to ensure the correctness of the participation of their competitors.

If a competitor joins the judge team or begins to work for the car audio industry during the season, they are no longer allowed to compete in the lowest SQ-category. If they have previously started in the above-mentioned categories, all qualifications reached before expire from this moment on.

### How Sound Quality/MM judging is performed

The sound quality judging will be performed with the actual, official EMMA-recording by one or two sound judges. These judges are specially trained and qualified to use the EMMA-Sound-Quality-recordings together with the EMMA sound quality rules and the score sheet as a tool to determine the sound-performance of a stereo- or a Multimedia system.

After the sound quality judging, the competitor will receive a qualified and detailed, objective feedback about the acoustical performance of the sound system installed in the competitor's car. EMMA has divided the sound quality part into easy-to-follow sections that will be judged and evaluated accordingly.

The judges will not tell you "Your car sounds good or bad or what points you have earned". With their evaluation and with the help of the score sheet they will explain exactly how the car sounds with all relevant details.

The awarded score will be easy to follow for the competitor, when necessary, with support of the EMMA-judge book. Furthermore, the competitor can learn about the potentials of their sound system. This will allow the competitor, a qualified dealer or an experienced friend to improve the sound system.

### Single seat judging

Typically, all categories will be judged by "single seat judging". This means one SQ- judge is sitting on the driver seat position.

In international competitions, every car will be judged minimum two times, with at least 30 minutes time given to the competitor to change the car in between judging's.

Only in local events, mainly for education purpose, it can happen that two judges will sit in the car during judging procedure. All scoring will be performed from the judge sitting in the driver's seat. Since on national and international finals, e.g. Euro finals, the competitor already qualified during previous events with receiving feedback about his system, no explanation about the sound judging result will be given to the competitor! Only technical malfunctions (e.g. noises) will be explained. At the ceremony the competitor will receive a copy of all score sheets or an averaged score sheet.

### Procedures and rules for Sound Quality Judging:

1. For sound quality judging, the car must be in a "ready for driving status" as used on public roads. Windscreens, window covers, curtains, etc. are not allowed to be used.
2. The competitor will suggest the volume to be listened at by the sound judges. To protect the judges from too high sound levels, the unweighted slow measurement on pink noise cannot be higher than 80dB.
3. Participants may advise the judges about the specific operational features of the system before SQ-judging begins. Depending on format and categories, participants will proceed to a designated area and remain there until judging has been completed or remain with the judge during the evaluation of the car.
4. During testing and scoring, judges must sit in the front seat of the car facing forward. This applies to all cars, including limousines. All competing cars must have the OEM number of front seats with the exception of the Multimedia classes, ESPL Expert or X Unlimited. If the car is judged by only one Sound Judge (not Multimedia), they must sit in the driver's seat. Windows, trunk and sunroof need to be closed during judging. Only convertibles can be judged with the roof and window down, when the competitor requests for it and the weather conditions are appropriate.
5. In multimedia if two judges are applied and the judges disagree on a sound quality score, they may switch seats to establish whether the car presents a different sound from each

- seat. If the judges agree that the system presents a different sound from each seat, they should arrive at a consensus score for each seat, and then average this.
6. The judge will verify that the competitor is able to operate the gearstick, the steering wheel and the pedals. (Note: If there is a very big difference between the height of the competitor (small) and the judge (tall), the judge is not required to judge the sound in the competitor's reasonable driving position. The other way around, a pillow or similar can be used to adjust the height difference. The reasonable driving position will be certified in a check box on the scoresheet.
  7. If it is not possible for the competitor to operate steering wheel, gearstick and pedals while seated, the judge will request the competitor to move his seat into a reasonable driving position before starting judging.
  8. The competitor is allowed to ask the judge to sit in their reasonable (driving) position. The competitor may also point out that the judges must not influence the sound coming from the speaker's placement in the car (kick panels, mounted under the seats, etc.) by either covering them with the score sheets or by blocking them with their feet.
  9. The judge is not allowed to re-adjust the seat without asking the competitor.
  10. The judge is not allowed to change his seating position during the judging process.
  11. It is the Head Judges decision whether to allow running engines so that the air conditioning or heating systems can be used during sound quality judging. If the running of engines is allowed, judges should adjust the car's ventilation fan to a quiet setting during the listening procedure.
  12. Prior to judging, the Head Judge will inform the judges and competitors whether cars will be judged for sound quality with the engine running or the engine off. This announcement should be made at the competitor's and judges' meetings. All cars must be judged consistently. It is within the Head Judges discretion to make exceptions based on extenuating circumstances (extremely loud engines etc.). In some climates this may impose unreasonable fatigue and/or discomfort on judges (very cold or hot weather).
  13. In events inside trade fair facilities, it can be the case that the start of engine is prohibited. In this case the engine noises will be zero.
  14. The judge should avoid any actions that could affect the sound performance. (E.g., not to wear hats/ball-caps, avoid chewing gum, turn off cellular phones, pay attention how the scoring board is held, etc.).
  15. Active judges (on the competition day) are not allowed to prepare any adjustments on a competition car (except their own if they are competing) during the event.
  16. The Judges are allowed to use the "additional tracks" on the official EMMA-Sound-Quality-recording to verify their impressions - judging will be done with the foreseen tracks.
  17. The Judges will not let any visual cue (apparent speaker locations) influence their judgement. Sound quality judges should be "blind" to any equipment in the car.
  18. If possible/necessary, the sound quality judges are invited to explain their scoring with additional notes/explanations written on the score sheet.
  19. In case of an equipment breakdown or car malfunction during SQ-judging, the competitor will be allowed 5 minutes to correct or repair any malfunction. Only one attempt (one period of five minutes) to repair is allowed. If the problem occurs again, the scoring will continue under the given circumstances. Furthermore, the Head Judge must be informed by the Judge about the malfunction/breakdown. To do so, the judge will mark on the score sheet "repair time taken"
  20. Depending on the judging mode, the Judges will show the score sheets together with an explanation about the scoring to the competitor, this will not take more than five minutes. Judges can refuse any further comment after this five-minute time.
  21. Depending on the judging mode, after the competitor has seen the score sheet and accepted the result, they should sign it.
  22. Should the competitor refuse for any reason the scoring or explanation presented to them by the Judges, shall it be done within this five-minute time. A protest must be made



immediately after the explanation of the Judges (see the corresponding chapter under General Rules). No protest regarding their scoring is allowed after signing the score sheet.

## 10.Judging Matrix

Installation Matrix					
	E	S	M	X	X Unl
Max. points	69	115	161	231	325
Presentation to the public	10	10	10	10	10
Bonus Presentation to the public			5	5	5
Cleanliness	6	6	6	6	6
System/Wiring Diagram	4	4			
System documentation			10	10	10
Explanation of system to the judges			5	10	10
Main fuse(s) present y/n	10	10	10	10	10
Are all wires to the components fused?		15	15	15	15
Is the fuse value appropriate to the wire size?		20	20	20	20
Any interior wires visible?		5	5	5	5
Wires properly terminated?			5	5	5
Wire terminations protected y/n			10	10	10
Wires protected from damage y/n			5	5	5
Are all components securely mounted?	24	24	24	24	24
Protection of speakers	5	5	5	5	
Does the vehicle allow a normal use?		6	6	6	
First Optic impression	10	10	10	10	10
Craftsmanship			10	50	50
Design of interior				5	10
Design of trunk				5	10
Overall design of vehicle					10
Bonus points				15	100

SQ Matrix					
	E	S	M	X	X Unl
Max Points	280	310	310	316	316
Position	25	25	25	25	25
Focus		25	25	25	25
Distance to Sound Stage	15	15	15	15	15
Width of Sound Stage	15	15	15	15	15
Height of Sound Stage	15	15	15	15	15
Room Information		5	5	5	5
Sub-Bass Section	30	30	30	30	30
Mid-Bass	30	30	30	30	30
Midrange	30	30	30	30	30
High Freq.	30	30	30	30	30

Overall spectral balance	30	30	30	30	30
Overall at high Volume	30	30	30	30	30
Listening pleasure	30	30	30	30	30
Switching noise	-6	-6	-6	-6	-6
System Noise	-6	-6	-6	-6	-6
Engine on test	-6	-6	-6	-6	-6
Limited view	-6	-6	-6	-6	
System Handling				6	6

Matrix MultiMedia	236	296
	MM 2.0	MM 5.1
Sound stage and room quality		
360° Level		25
360° Movement		25
Room quality – sub	10	10
Room quality – front stage	10	10
Room quality – surround		10
System separation	25	25
Tonal accuracy and spectral balance		
Sub-bass	15	15
Midbass	15	15
Midrange	15	15
High frequency	15	15
Spectral Balance		
Normal volume	15	15
High volume	15	15
Voice/timbre matching	25	25
Picture Quality		
Details and resolution	15	15
Contrast and brightness	15	15
Colour	15	15
Multimedia experience	25	25
System Handling		
System handling	6	6
Adjustments		
Switching noise	-6	-6
System noise	-6	-6
Limited view	-6	-6

Matrix ESPL		
	<b>T/ R /B / W</b>	<b>Expert</b>
	110+	114+
Measurement with open doors		
Measurement with closed doors		
Presentation to the public	10	10
Cleanliness	6	6
Main fuse(s) present y/n	10	10
Are all wires to the components fused?	15	15
Is the fuse value appropriate to the wire size?	20	20
Any interior wires visible?	5	5
Are all components securely mounted?	24	24
System/Wiring diagram	4	4

Does the vehicle allow a normal use?	6	
First Optic impression	10	10
Overall design of vehicle		10
Limited View	-6	

Matrix ESQ		
	Limited	Unlimited
	296	290
Sub-Bass Section	30	30
Mid-Bass	30	30
Midrange	30	30
High Freq.	30	30
Overall spectral balance	30	30
Listening pleasure	30	30
Bonus for enjoyment to public	6	6
<b>Install Max Points</b>	<b>110</b>	<b>104</b>
Presentation to the public	10	10
Cleanliness	6	6
Main fuse(s) present y/n	10	10
Are all wires to the components fused?	15	15
Is the fuse value appropriate to the wire size?	20	20
Any interior wires visible?	5	5
System/Wiring diagram	4	4
Are all components securely mounted?	24	24
Does the vehicle allow a normal use?	6	
First Optic impression	10	10
Limited View	-6	

Matrix EMMA Tuning				
		Stock+	Custom T	Custom Unl
		193	258	263
Installation	Presentation to the public	5	5	5
	Cleanliness	3	3	3
	Main fuse present	5	5	5
	All components fused	5	5	5
	Fuse value appropriate to cable size		5	5
Interior	Craftsmanship and design	10	10	10
	Dashboard door skins		5	5
	Seats	5	5	5
	Foot Room		5	5
	Roof	5	5	5
	Interior Light	5	5	5
Trunk compartment	Craftsmanship and design	10	10	10

	Surfaces Changes	5	5	5
	Light	5	5	5
	Features		5	5
Tuning Technical	Power of engine		5	5
	Brakes	5	5	5
	Drive Train		5	5
	Oil & Water Cooling		5	5
	Air Intake System	5	5	5
	Exhaust system	5	5	5
	Chassis suspension	5	5	5
Tuning Design	Craftsmanship and design	10	10	10
	Rims & tires	5	5	5
	Spoilers & body kit		10	10
	Window modifications	5	5	5
	Lights	5	5	5
Paint Job	OEM Paint – show & shine	5		
	Craftsmanship and design		10	10
	Special features		10	10
SQ	Stage width	5	5	5
	Distance to sound stage	5	5	5
	Stage height	5	5	5
	Sub-bass	5	5	5
	Mid-bass	5	5	5
	Midrange	5	5	5
	High-frequency	5	5	5
	Listening Pleasure	10	10	10
SPL	SPL Score	35	40	45

EMMA is powered by:

Fuse Size Matrix			
	Cable size	AWG	Fuse Rating
	0,5mm <sup>2</sup>	20	10 Ampere
	1,0mm <sup>2</sup>	17	15 Ampere
	1,5mm <sup>2</sup>	15	20 Ampere
	2,5mm <sup>2</sup>	13	20 Ampere
	4,0mm <sup>2</sup>	11	30 Ampere
	6,0mm <sup>2</sup>	9	50 Ampere
	10mm <sup>2</sup>	7	60 Ampere
	16mm <sup>2</sup>	5	100 Ampere
	25mm <sup>2</sup>	4	125 Ampere
	35mm <sup>2</sup>	2	175 Ampere
	50mm <sup>2</sup>	0	250 Ampere
	70mm <sup>2</sup>	2/0	300 Ampere

## 11. Revision History

All relevant modifications of this rulebook will always be available for download at [www.emmanet.com](http://www.emmanet.com). The adoptions and modifications published online are valid from the day of publishing which is noted in the link description and the document itself.

Version	Date	Author	Description
1	2022-02-01	Head Judge Council	Initial Version
2	2022-04-26	Christian Körbel	Correction of Matrix, limited view
3	2022-05-10	Christian Körbel	Correction of SQ Matrix
4	2023- 01-15	Alex Klett	Addendum points

### Notes:

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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