



 **EMMA**
european mobile media association

SOUND QUALITY JUDGING MANUAL
EMMA SQ RULES 2009 / 2010 made easier V3.69



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Special thanks to **Norbert Tyka & Reinier Wolf**

SOUND QUALITY JUDGING FOR 2009 / 2010 CD

5 Introduce yourselves in a polite way to the competitor.

Follow the procedures and rules 1 to 23 that are described in pages 41 & 42 in the Rulebook.

5.1 Pre Judging Check

5.1.1 Checking Charger Y / N

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

5.1.2 Verification of Reasonable Driving Position Y / N

Check if the competitor is able to operate the gear-stick, the steering wheel & the pedals, with the given driver's seat adjustment, and document it in the **checkbox**.

TRACK 1 : Introduction track.

It can give you an idea of the sound which is fast, clean and full.

The voice sounds clear and direct.

5.1.3 Channel Verification

TRACK 2 : voice only on Right Channel

Verify that L and R channels are correct, and document it, to the **checkbox** on the score sheet.

In case L & R channels are reversed, notify the competitor and give him 5 minutes to correct the problem.

If he is not able to correct it, the competitor will decide if he/she wants to continue the judgment or not.

5.1.4 Calibration of Volume

The Competitor will suggest the volume to be listened at by the sound judges. The Judges should use this Volume! Only in case that the suggested Volume is too loud (see Point 5.1.4 in the Rulebook, more than 80dB), the Judges have to take a measurement to correct the Volume.

If the Competitor doesn't suggest a Volume, follow these Steps:

TRACK 2: voice only in the Right channel counting from 1 to 10

The voice level of the passenger side judge should be as loud as we talk in meetings. Not like talking to your girl friend.

The music should sound louder than background music or music suitable for conversation.

Should be loud enough to be able to hear all the details of the music, in full body.

The 2 judges should be able to clearly hear each other when they talk a little louder than normal.

Document the volume level to the **checkbox** on the score sheet.

5.2 Sound Stage & Imaging

TRACK 3

This is a pure technical Track to speed up the judging process of the stage boundaries. The room size is like the drawing below.

Check especially the depth and ambience of the EFL & EFR position. This must give you an

impression of the room. The distance between all points from L to R is the same (50cm).



POSITIONING YOUR HOME LOUDSPEAKERS USING THIS TECHNICAL TRACK

Applies to most loudspeakers except if the maker states differently.

The 2 main Loudspeakers (tweeters) should be angled towards the centre, a little less than 45 degrees (e.g. 35 or 40)

so that, at the listening position the left tweeter is aiming close to your left ear and the right tweeter close to your right ear.

The listener should be just a little bit before the top of an equal side triangle, distinguished by the 2 Loudspeakers (tweeters) and Him(back of his neck).

The triangle sides should be between 180cm to 300cm depending on the size of the room and the listening position.

The distance between the 2 Loudspeakers (tweeters), can be a little smaller (250cm), but the other 2 sides of the triangle should have the same length(300cm)

The 2 Loudspeakers should be 80cm or more from the side & back walls of the room.

Then everything on stage falls in perfect place.

If the angle of your loudspeakers is too less (e.g.20 degrees) you will get more width and less depth and/or create gaps on the stage.

Gaps on the sound stage are probable also when placing the loudspeakers too far away (e.g. 4m) from one another.

If the angle of your loudspeakers is too much (e.g.55 degrees) you will get more depth and less width

and you will have instruments closer to one another, and/or possibly over one another depending on the distance between your loudspeakers(e.g. 60cm)

The size of the room is critical. Also the makings & the furniture in the room can add or deduct to the sound.

E.g. a room size of about 450cmX650cmX270cm will sound a lot better than a cubic size room, because it has a lot less standing waves.

A LITTLE THEORY ABOUT SOUND

When judging depth or width we must take into consideration certain things about sound.

1. The speed of sound in dry air of 20 degrees C, is 1235Km/h
2. A sound, sounds louder by 6db for every half distance we move closer to it.
3. A sound, sounds lower by 6db every time we double our distance from it.

In our case we stay at the same position, but we have the sound moved away, which is basically the same.

EXAMPLE

The listener is 50cm from a sound source. (from L) We have 90db at the listening position.

We move this sound source to 100cm from the listener. We have 84db at the listening position

We move this sound source to 200cm from the listener. We have 78db at the listening position

We move this sound source to 250cm from the listener. We have approximately 76,5db at the listening position

We move this sound source to 350cm from the listener. We have approximately 73,5db at the listening position

LEFT

FAR LEFT

EXTREME FAR LEFT

An easy way to get some experience of judging the distance of a sound (depth and width) is to try to reproduce physically the technical track in a room of similar size

Stay 50cm away from C position and close your eyes

Your girlfriend whispers your name from L position, approximately 120cm from you

Your girlfriend whispers your name from FL position, approximately 280cm from you

Your girlfriend whispers your name from EFL position, approximately 390cm from you.

LEFT

FAR LEFT

EXTREME FAR LEFT

Do the same on R, FR, EFR

You can do the same for the width positions, from left to right.

5.2.1 Sound Stage - Distance to the Soundstage (0 - 15 points)

This is the distance between the listener and where the soundstage begins.

TRACK 3

The 5 front stage positions are on a straight line, from left to right and should appear stable in distance from the listeners and ideally out of the windshield.

The sound of his voice does change from position to position, but remains the same characteristics.

Judge the distance from the listener to the front five positions.

13 to 15 points - Is out of the bottom of the front windshield

12 points - Is at the bottom of the front windshield, but not out of the car

9 to 11 points - Is between the beginning of the dashboard and the bottom of the front windshield

7 to 8 points - Is between the top of the steering wheel & the beginning of the dashboard

6 points - Is at the top of the steering wheel.

4 to 5 points - Is between the top of the steering wheel and the listener's body

3 points - Is on the face or chest of the listener

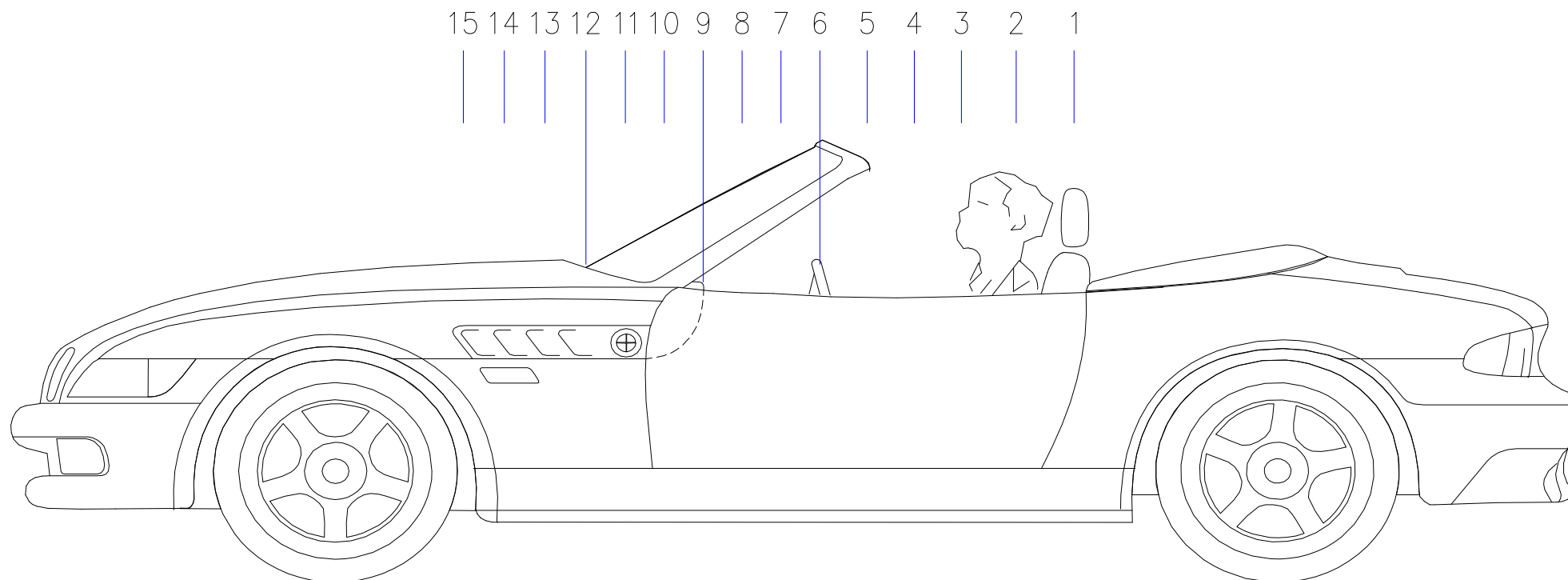
2 points - Is on the head of the listener

1 point - Is behind the listener

0 points - Impossible to define

Avoid to score 0 or 1 unless is absolutely necessary.

Every Judge scores the five front positions and divides the sum by 5 (average).



5.2.2 Sound Stage - Width of sound stage (0 - 15 points

This Is the distance between left and right of the soundstage.

TRACK 3

Ideally the Speaker when talking from far left and far right position, should appear to be out of the side boundaries of the vehicle

The sound of his voice does change from position to position, but remains the same characteristics.

Judge the distance from far left to far right

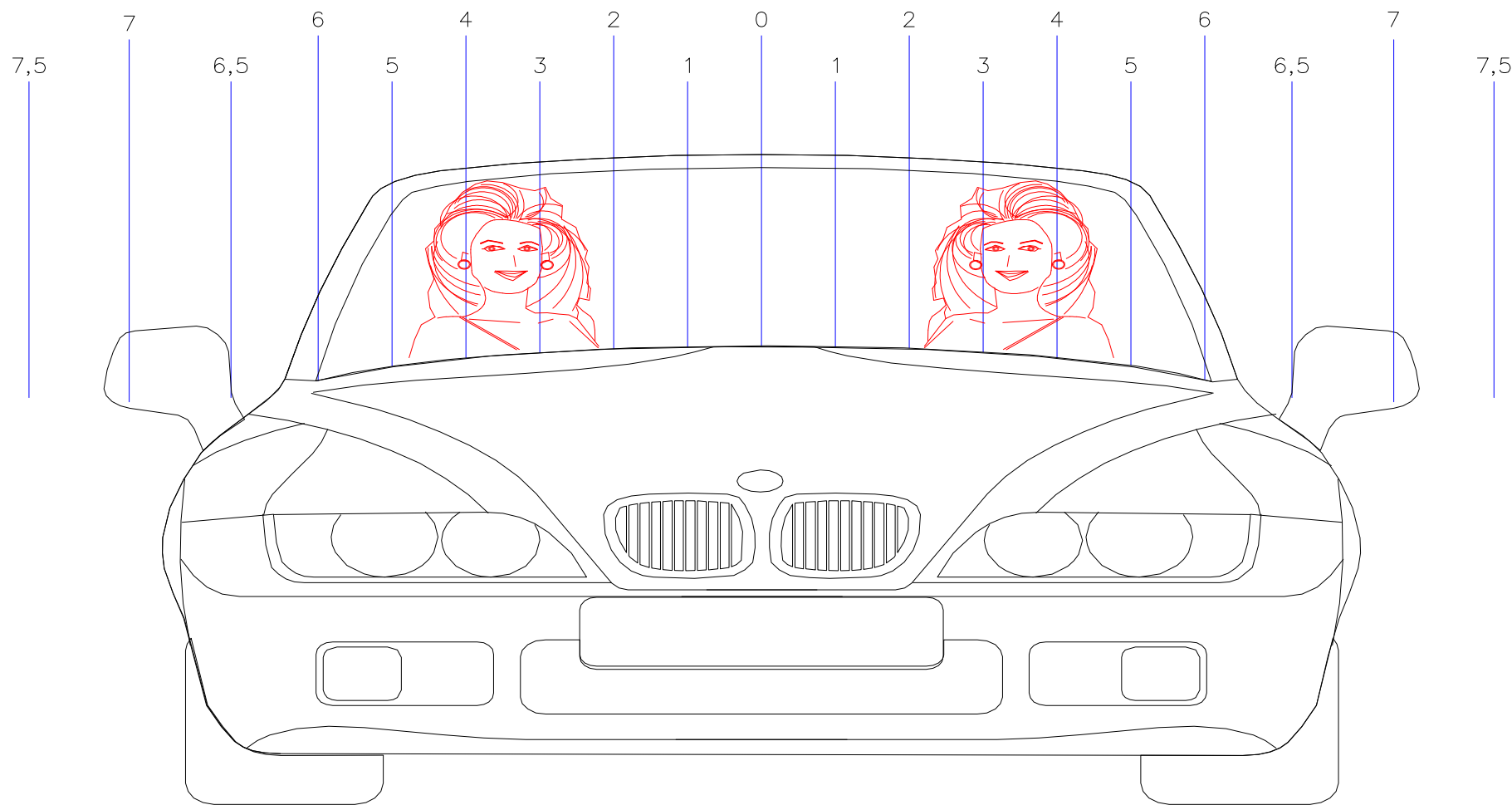
For scoring follow the blue lines on the diagram.

Add the left and right points.

Deduct 2 points from the total if there is a big difference in Width from the 2 front stage positions to the 2 far stage positions.

Big difference = 2 or more points difference in total. (E.g. Front 12p, Far 14p or 10p)

Never score 0 and avoid to score 1 unless is absolutely necessary.



5.2.3 Sound Stage - Height of the sound stage (0- 15 points)

Ideally the stage height should be stable at horizon level from (far) left to (far) right, with some vertical spread below and above that level. That means, that some instruments may appear a little lower or a little higher than most of the others who appear at horizon level. Be careful, instruments should not appear below the stage floor.

TRACK 3

Ideally the Positions from left to right should appear stable in height and at horizon level. The sound of his voice does change from position to position, but remains the same characteristics. For scoring follow the blue lines on the diagram.

Score the five front stage positions and divide the sum by 5 (average).No round up
Deduct 2 points from the total if there is a big difference in Height from the 5 front stage positions to the 5 far stage positions.
Big difference = 2 or more points difference in total. (E.g. Front 12p, Far 14p or 10p)
Never score 0 and avoid to score 1 unless is absolutely necessary.



5.2.4 Sound Stage - Depth of sound stage (0 - 10 points)

This is the stage size in depth. It begins at Distance to Soundstage and extends in depth towards the front of the vehicle
Some instruments or voices appear to be in front or behind others creating the stage depth

TRACK 3

Score the distance from the 5 front positions to the 5 far positions.

The sound of his voice does change from position to position, but remains the same characteristics.

Judge the distance from all 5 front positions to all 5 far positions.

To score maximum points you should have the same distance for width and depth.

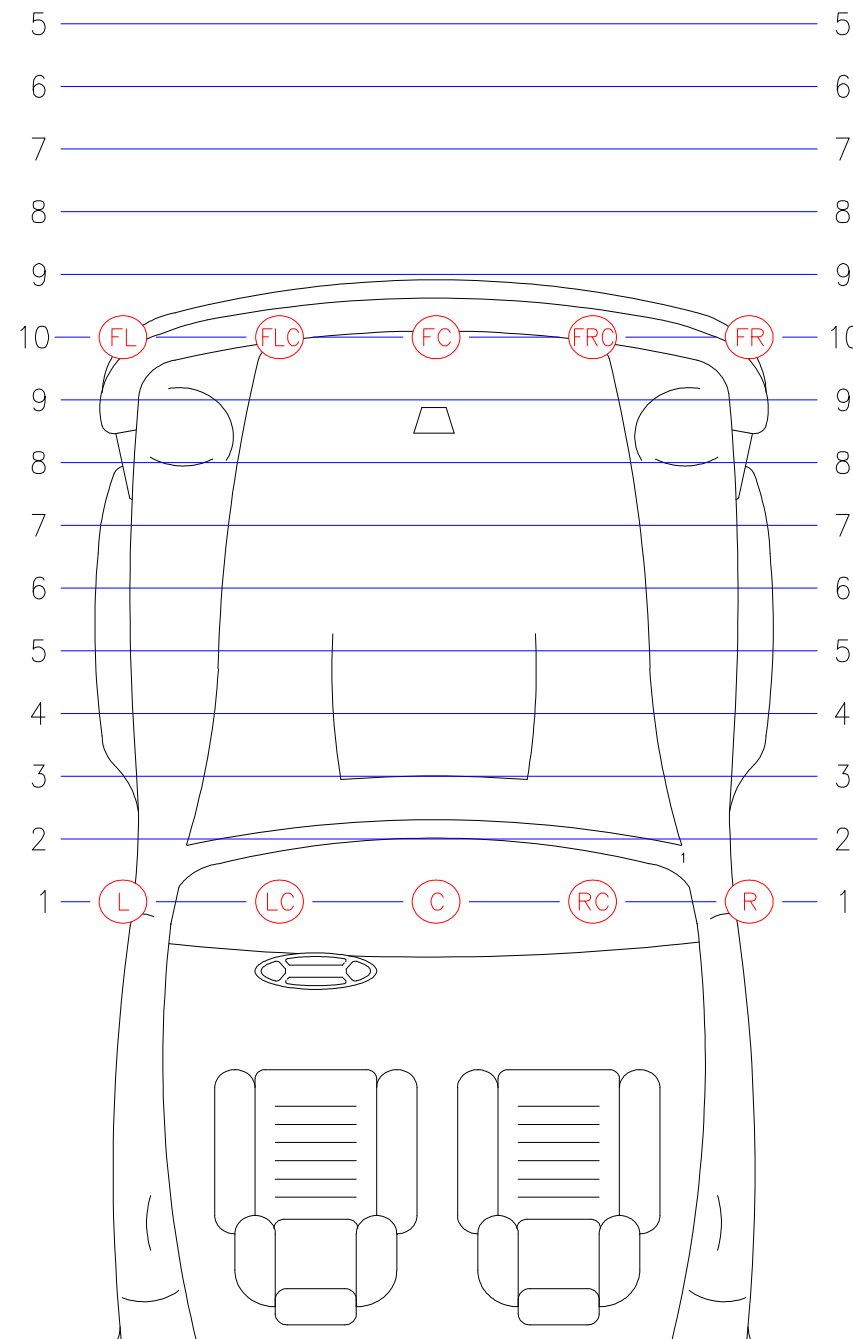
Score each positions and divide the sum by 5 (average).

Never score 0 and avoid to score 1 unless is absolutely necessary.

The diagram on the right is only an example, and it may vary, depending on the size of the car & the length of width.

It only indicates that the shape of the stage should be rectangular.

This means that we should have the same distance in width & depth, to give full points.



5.2.5 Sound-Stage - Ambience (0 to 10 points)

This is the sense of space around the music created by room reverberations in which the recording took place, or created by the engineers. Either way you should close your eyes and imagine the room size you are listening in.

Imagine the size of the room.

It is not necessary that the positions are so far out of the car, but you should sense the size of the room and the reflections of the sound, on the walls and the ceiling, in order to give a high score.

TRACK 3

3 points = EFL to FL is 1/2 distance than from L to FL

2 points = less or more than the above distance (but there is some distance)

1 point = no distance

3 points = EFR to FR is 1/2 distance than from R to FR

2 points = less or more than the above distance (but there is some distance)

1 point = no distance

TRACK 6

4 points = realistic - The Choir is about 2m behind the lead Vocal & sounds like in a room definitely bigger than the stage size.

3 point = almost realistic - The Choir appears to be close to the back of the stage & sounds like in a room slightly bigger than stage size.

2 points = some impression of room - The Choir is behind the Lead Vocal and sounds like in a room about the stage size.

1 point = no impression of room - The Choir is behind the Lead Vocal & sounds like in a room definitely smaller than stage size

Add all the above points on the score sheet for Ambience

5.3 Imaging

The sound stage is defined by the above judging. Now you should define what is happening inside this stage.

TRACK 3

The pictures in the rule book will help you define the positions.

5.3.1 Front Stage Imaging - Positions (0 to 25 points)

The stage size in width has already been established during 5.2.2

Now you should find out if the stage is evenly divided to 5 distinct positions from left to right, as the drawing below.

Each position scores as follows :

5 points - correct location

4 points - position shifted half location away

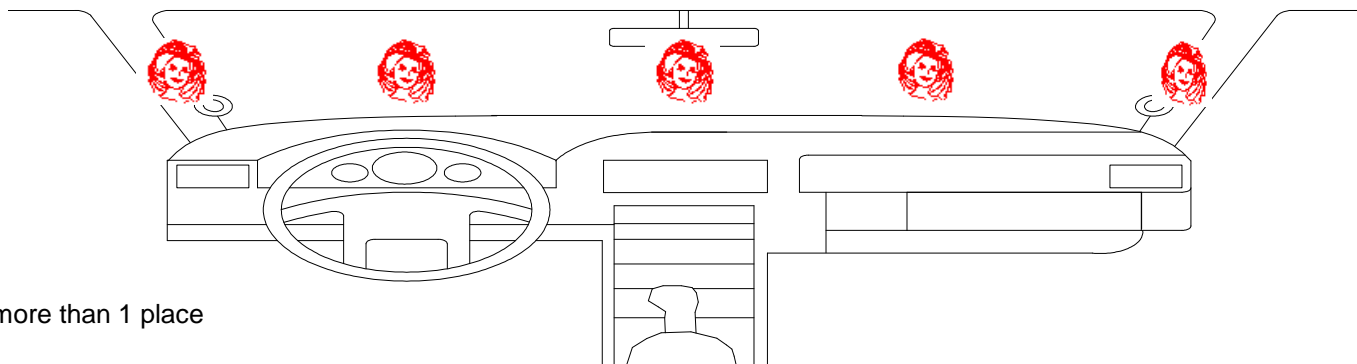
3 points - position shifted 1 position away

2 points - position shifted 2 positions away or in more than 1 place

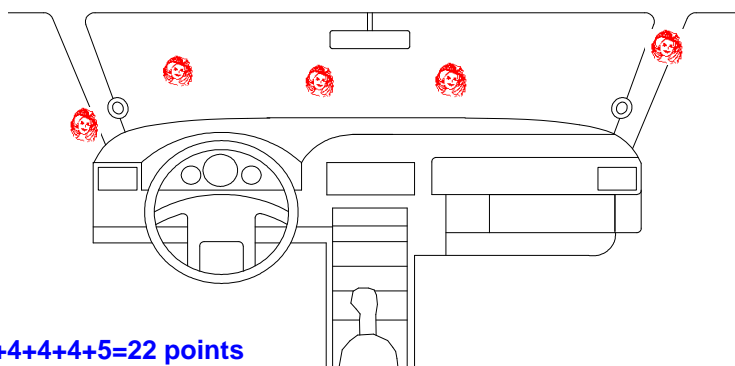
1 point - position impossible to localise

0 point - no sound

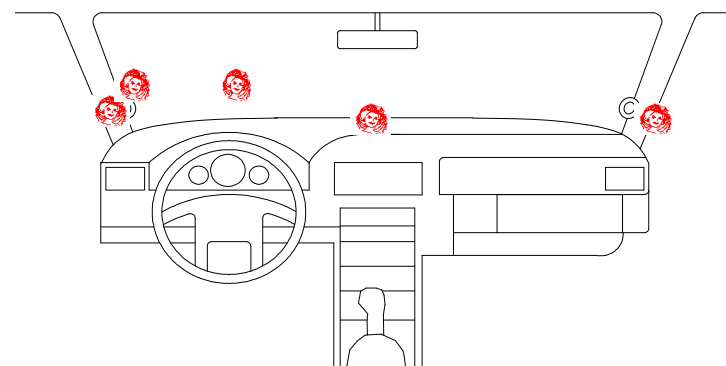
Avoid to score 1 unless is absolutely necessary.



5+5+5+5+5=25 points



5+4+4+4+5=22 points



5+3+3+3+5=19 points

5.3.2 Imaging - Front stage Focus (0 - 25 points)

TRACKS 3 - 7

For judging the focus, use the speaker's voice of Track 3 for the 5 front stage positions and make a note of the points.

Then use the musical Tracks 4 to 7 to verify or correct your scoring

Look for the correct size of several instruments. The focus of a Triangle is small like a finger tip.

The focus of a Bass drum is much greater. Nevertheless all Instruments should have a correct size and focus, which is proportional to the given soundstage and to one another

You have to verify that the position of every instrument is at it's original position, with the correct focus.

You have to compare the size of instruments & voices. They must be proportional to one another.

How to score

5 points - correct focus and size of instruments & voice - no differences

4 points - slightly unfocused or slightly incorrect size of instruments & voice - small differences

3 points - focus not correct in size - instrument & voice too big or too small

2 points - instrument & voice have no focus but you can barely localise it

1 point - instruments & voice impossible to localise

0 point - no sound

Avoid to score 1 unless is absolutely necessary.

PHASE

In the car we can detect phase differences, mostly from the passenger side.

Small phase problems: most people cannot detect them, as they are too small and you have to concentrate on details to spot them.

We can describe these problems as in Medium , but a lot less hear able.

Medium phase problems: most people detect that something is wrong about the music, but cannot describe what.

Sometimes the music sounds like it is coming from further away creating an ambience like a church.

Sometimes you feel that an instrument is coming forward or backward depending on the frequency.

Some instruments sound natural, but others sound unnatural, depending on the frequency.

Small or big emptiness in low frequencies are more easily detectable.

A phase difference only on a frequency, make instruments sound unnatural on this frequency only.

It can be that the same sound e.g. Floor Tom comes from Subwoofer with a time difference than from Midbass.

Big phase problems: are easily detectable as they make music sound completely unnatural and annoying.

We can describe these problems as in Medium , but on a superlative degree..

EMPTINESS IN SOUND

For the low frequency instruments, the subwoofer and midwoofer frequencies are responsible

For voices and mid frequencies instruments, the midwoofer and the midrange frequencies are responsible.

For voices and high frequency instruments, the midrange and high frequencies are responsible.

BASS & BASS DRUM

Most of the time bass drum and base hit at the same time in similar tones.

On well adjusted systems you will be able to distinguish separate from one another.

They effect the SUB & MIDBASS area.

ATTACK

It is how fast a sound comes into stage.

Some sounds come in very fast (snare, cymbal), while others come in slower (piano,)

A good system should be able to reproduce all of them very realistic.

DECAY

All sounds even the most sharp ones have a continuation of sound (decay - ambience) after the finish.

The slow sounds have big decay while the fast ones have small decay.

Normally low frequencies have bigger decay than High ones.

SUGGESTION FOR THE SOUND JUDGES

Judge Tonal Accuracy using tracks 4 & 5. Then verify your judging using tracks 6 & 7, following the rule below:
(as tracks 6 & 7 will sound more pleasant in most systems.)

The systems that can reproduce all tracks with the same SQ should get more points.

The systems that have a difference in SQ from tracks 4 & 5 to tracks 6 & 7 should get less points.

This difference should also effect your judging on Overall Spectral Balance.

FOR ALL MUSICAL TRACKS

The Bass Drum, the Bass and the Lead Vocals of all tracks are at centre position.

The **Bass Drum** is always behind the **Bass**

Bass Drum has quit big focus, **Double Bass** has bigger focus in lower tones, but smaller size & more precise focus on higher tones.

Electric Bass is about the same size with bass drum on low tones, & has more focus on higher tones.

When **Bass Drum** sounds, **Bass** sounds at the same time. You should be able to distinguish these 2 diferent sounds very clearly & easily.

Train your ears using track 19. Listen to the Bass Drum alone. Listen to the Double Bass alone. Then listen to them together.

The Snare Drum tends to be a bit right of centre .

The Lead Vocals in front C

PIANO : From L to R. Deep Tones towards the L, High Tones towards the R, coming slightly forward.

Sounds smooth, musical and rich, making wide big sounds especially in Lower Tones. Very big focus.

Sounds like a big wooden instrument, and little wooden hammers with cushions hit the metal strings.

The Mid and High Tones sound more narrow but still you can hear and sense the big instrument behind them.

CONSOLE EFFECTS From small to big : PHASER - FLANGER - CHORUS - DELAY (repeat 1 or more)

TRACK 4 : MOONGLOW

Entertainment Jazz mix, with nice reverb on Vocals. All instruments linear. Live recording, powerful sound.

Linear and Natural sound. It will sound fine, only in good systems.

On 2:00 there is a double drum stick/brush stick hit, on the metal rim of the snare drum R of C .
In systems that are not tuned well, it will sound as an electric noise switch, or as a mastering mistake.

PIANO : From L to R. Very Big focus across the whole soundstage. Deep Tones towards the L, High Tones towards the R. SUB MB MID TW
Sounds smooth and musical, making wide, big, open sounds especially in Lower Tones.

DRUMS :From L to R, behind the Piano.
Toms and Bass Drum. Big focus in C, quite smaller than Piano. Sounds deep & clean. SUB MB
Brushes. Cymbals. High Hat. Snare drum. Respectively smaller focus MID TW
They sound natural clear & shiny.

LEAD VOCAL : On the C. Focus smaller than Bass Drum. MB MID TW
Her voice is warm, sweet and natural, you can hear the body behind the voice. Nice reverb.
Vibrates on 0:53 and 2:00 & makes her voice just a little hard. On 0:38 the S is thicker and you can hear the air coming through her teeth.
From 0:31 to 0:35 her voice will loose focus & will sound muddy only in **NOT** well tuned systems.

DOUBLE BASS: On the C. Focus big almost like Bass Drum. Sounds Deep, firm, thick & clear. SUB MB
You should be able to separate the sound of the double bass and the bass drum.

TRACK 5 : STAENDCHEN IN D

Classic track without equalizer. Live recording with only room reverb.
Linear and Natural sound. It will sound fine, only in good systems.

PIANO : From L to R. Big focus across the whole soundstage. Deep Tones towards the L, High Tones towards the R. SUB MB MID TW
Sounds smooth and musical, making wide big sounds especially in Lower Tones.
Should be easily heard through the whole track and well distinguished from the acoustic guitar.

FLUTE : Is 48% R. In front and higher than the Piano The focus is small but bigger than the triangle. MID TW
It is the major instrument. Sounds sweet and natural.
Listen for the air coming out of the instrument . The breath of the player 0:13, 0:25, 0:32, 0:58, sounds different .
Listen to the small sounds coming from the switches of the flute. They are quite similar to one another.

ACOUSTIC GUITAR: Is 48% L. Focus size between Bass & Flute. A little lower than the flute. Sounds clean dry and natural. MB MID TW

TRIANGLE : Is 48% R. With overdub. Small but very precise focus. High. It sounds very clean. MID TW
There are 9 triangle dings 0:39. The sound of 1st,3rd,5th,7th,9th is a little bit more quiet as they are upstroke hits, close to upper area of the triangle, were the other hand of the player holds the triangle & dumps it's sound. 2nd,4th,6th,8th are down stroke hits and sound a little bit more bright. Of course there are some slight sound differences between them depending on the hitting power of each stroke.
Depending on your Loudspeaker configuration the positions of the upstrokes and down strokes may vary slightly(L R), but not the sound.
This is not so obvious at all strokes, but you should be able to recognise upstrokes 1 & 9 easily.

DOUBLE BASS :Is on the C. Big focus, smaller than Piano, but bigger than the rest. Very clean, firm and deep. SUB MB

TRACK 6 : A CHANGE IS GONNA COME

Live recording with a touch of additional reverb on Lead Vocals. Drum Kit and Bass compression big time.
The Choir stands far behind the Lead Vocal, making this track ideal to check the depth of the soundstage.
Big, colourful, wide, pleasant, sound with a little more touch on low frequencies. Everything is crystal clear.

Powerful dynamic sound. It will sound good in most systems.

ORGAN : From L to R. Wide focus, somehow smaller than the Piano. Is coming tenderly behind the other instruments. **MID TW**

PIANO : From L to R. Big focus. Sounds rich occupying the whole soundstage. **SUB MB MID TW**

BIG CHOIR : From 80% L to 80% R. Big focus, almost like the Piano. Coming from the back of the stage. Powerful and natural. **MB MID TW**
Starts lower in volume & as it gets louder acquires more presence.

E-BASS : In C. Focus smaller than the Bass Drum. Deep, clean and fast without distortion. Sounds louder in front. **SUB MB**
You should be able to separate the sound of the E-bass and the bass drum.

DRUMS :

Bass Drum. Big focus but smaller than Organ, Piano, Choir. Sounds fast dry and deep. Hits at same time with bass. **SUB MB**
The Cymbals on the L, high, small focus sound clean.. The Snare precise & very realistic. The Drumsticks on 1:42 fast & staccato. **MID TW**

LEAD VOCAL : On the C. Focus smaller than piano, bass drum, but bigger than the rest. Very powerful clean deep voice, **MB MID TW**
with substantial presence. On 3:21 , for only 1" the voice loses the tune and sounds a little hard.(more audible when loud)
The effort of the singer should be detectable all the time, especially in high tones.

TRACK 7 : BLUES POWER

Delay on guitars and vocals, no reverb, heavy compression on the sum. Old school mix. Quite dry sound.

Listen to the instruments, how they sound alone, and how they sound when played together. Do they have the same tone & focus?

Does an instrument interfere the sound of another ?

Powerful dynamic sound that will sound good in many systems.

GUITARS : 70% on L and R. Medium size focus. The delay makes them sound like in a big room. **MB MID TW**

SOLO GUITAR : 17% R. Medium size focus. Nice clear sound. **MB MID TW**

PIANO : From L to R. Big wide focus. Very clear without distortion. **SUB MB MID TW**

DRUMS : Bass Drum with big focus, very powerful, clear, fast and punchy, but not very deep. **SUB MB**
Snare with smaller focus, is fast and clean with some delay. **MID TW**
Floor Toms at 1:02 & 1:25 **SUB MB**

BASS : In C, medium focus, in the beginning of the track. **SUB MB**

LEAD VOCAL : In the C, big focus for a voice, with delay & chorus effect. **MB MID TW**

5.4.2 Tonal accuracy (0 - 120 points)

Tracks 4,5,6 & 7

Sub-bass - 10 to 60 Hz (0 - 30 points)

Instruments : Double Brass, Tuba, Trombone, French Horn, Woodwinds, Electric Bass, Bass Clarinet, Contrabass, , Bass Violin, Cello, Harp, Big drums, Piano, Organ, Viola, Harp

A 28 to 30 points - excellent, realistic sound

Excellent life like effortless base, fast with endless dynamics, gives the size body of the base instruments - realistic and natural - fills the place with music - sense the air and the room around the instruments - a real joy to listen to Bass drum and Base sound ideally together, & when played at the same time, & totally distinct. The low Piano tones are very much distinguished & are not at all confused with Bass & Bass Drum tones.

B 25 to 27 points - very good sound, almost excellent

Very good sounding base - very close to, but not exactly life like - very good dynamics close to perfect - small difference on the size of the base instruments - very fast but not fast enough - you feel that something is missing or just a little less than correct Bass drum and Base sound quit good together, & at the same time quit distinct. The low Piano tones are quit distinguished & are not confused with Bass & Bass Drum tones.

C 19 to 24 points - good sound, almost no mistakes

Correct and clean base sound - incorrect size of the instruments - good dynamics but not enough - sounds clinical, artificial, a little unnatural, not life like - sounds somehow correct but does not give any feeling of the music- Bass drum and Base sound good together, & they distinct a little. (not all the time) The low Piano tones are a little distinguished & sometimes are confused with Bass & Bass Drum tones.

D 13 to 18 points - acceptable sound - some mistakes - not hard to listen to

Base is there - not bad to listen to - lacks dynamics - not so clean - a little muddy - a little less or more than normal - not natural Bass drum and Base sound acceptable together, without distinction. The low Piano tones are NOT distinguished & most of the time are confused with Bass & Bass Drum tones.

E 7 to 12 points - poor sound and/or big mistakes

Base that is too much or too little - has too much sound "tail" - boomy - not clean sound - definitely not natural Bass drum and Base sound together, covering one another. They sound like 1 instrument. The low Piano tones are NOT distinguished & ALL the time are confused with Bass & Bass Drum tones.

F 1 to 6 points - unacceptable, harsh sound

Very bad base, sounds harsh - nothing to do with music - very boomy - blur, muddy sound - base not there Bass drum and Base sound in a way that you cannot tell which instrument plays what. The low Piano tones do not sound like a Piano, & cannot tell the difference between them, & Bass and/or Bass Drum tones.

G 0 points - no sound

Deduct 2 points if the Sub Bass is coming from behind.

Additional hints:

Never score 0 and avoid to go lower than 7 unless it is absolutely necessary.

To score **A** should be the absolute sub-bass - maybe nobody had the pleasure to listen to it yet inside a car

To score **B** should be the almost excellent sub-bass achieved only in very few cars

To score **C** is a very good sub-bass - cannot find it an every day car. Sounds correct but does not give much pleasure to listen to.

Mistakes or miss-adjustments in the crossover area should normally result in lower scoring on both Sub-bass and Mid-bass sections

Never score 0 if there is a sound, and avoid to go lower than 7 unless it is absolutely necessary.

Midbass - 60 to 200 Hz (0 - 30 points)

Instruments: 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

A **28 to 30 points - excellent, realistic sound**

Excellent life like effortless mid base, fast with endless dynamics, gives the size body of the instruments & voices - realistic and natural - fills the place with music - sounds warm and makes you feel the music - sense the air and the room around the instruments - a joy to listen to

Bass drum and Base sound ideally together, & at the same time totally distinct. The Lead Vocals are in front of you with flesh and blood. The low Piano tones are very much distinguished & are not at all confused with Bass & Bass Drum tones.

B **25 to 27 points - very good sound, almost excellent**

Very good sounding midbase - natural very close to life like - very good dynamics close to perfect - small difference on the size of the instruments - very fast but not enough - gives some feeling of the music - voices with some body (a little smaller or a little bigger) you feel that something is missing or a just a little less than correct

Bass drum and Base sound quit good together, & at the same time quit distinct. The Lead Vocals are in front of you with some flesh and blood The low Piano tones are quit distinguished & are not confused with Bass & Bass Drum tones.

C **19 to 24 points - good sound, almost no mistakes**

Correct and clean midbase sound - incorrect size of the instruments - good dynamics but not enough - sounds clinical, artificial, voices without body unnatural, not life like - needs to be faster - sounds somehow correct but does not give the feeling of the music

Bass drum and Base sound good together, & they distinct a little. (not all the time)The Lead Vocals are in front of you with some body behind them. The low Piano tones are a little distinguished & sometimes are confused with Bass & Bass Drum tones.

D **13 to 18 points - acceptable sound - some mistakes - not hard to listen to**

Midbase that is there - not bad to listen to - lacks dynamics - some emptiness in sound - not fast -not so clean - a little muddy - a little less or more than normal - not natural

Bass drum and Base sound acceptable together, but without distinction. The Lead Vocals are in front of you with NO body behind them. The low Piano tones are NOT distinguished & most of the time are confused with Bass & Bass Drum tones.

E **7 to 12 points - poor sound and/or big mistakes**

Midbase that is too much or too little - riggings appear in one or more frequencies - emptiness in sound - definitely not natural

Bass drum and Base sound together, covering one another. They sound like 1 instrument. The Lead Vocals sound like an empty voice in the air. The low Piano tones are NOT distinguished & ALL the time are confused with Bass & Bass Drum tones.

F **1 to 6 points - unacceptable harsh sound**

Very bad midbase, sounds harsh - nothing to do with music - boomy - sounds completely empty - burr, muddy sound

Bass drum and Base sound in a way that you cannot tell which instrument plays what. The Lead Vocals sounds hard & annoying. The low Piano tones do not sound like a Piano, & cannot tell the difference between them, & Bass and/or Bass Drum tones.

G **0 points - no sound**

Additional hints:

This frequency area gives warmth to the sounds & and idea of the size of most big instruments & voices

Never score 0 and avoid to go lower than 7 unless it is absolutely necessary.

To score **A** should be the absolute mid-bass - maybe nobody had the pleasure to listen to it yet, inside a car.

To score **B** should be the almost excellent mid-bass achieved only in very few cars

To score **C** is a very good mid-bass - cannot find it in an every day car.

Mistakes or miss-adjustments in the crossover area should normally result in lower scoring on both Sub-bass and Mid-bass sections, and/or Mid-bass and Midrange sections

Never score 0 if there is a sound, and avoid to go lower than 7 unless it is absolutely necessary.

Midrange - 200 to 3000 Hz (0 - 30 points)

Instruments : 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

A **28 to 30 points - excellent, realistic sound**

Excellent life like effortless mid, fast with endless dynamics, gives the size body of instruments & voices, realistic and natural - wind instruments sound perfect - fills the place with music - sounds warm and makes you feel the music - sense the air and the room around the instruments - a joy to listen to
The sounds from different Cymbals, Foot Cymbals, Brushes, are very distinguished & the different tones between them are detected very clearly
The different sound tones on the same cymbal when the stick hits on different area on it, are very clearly detected.
The Lead Vocals are in front of you with flesh and blood, & all Guitars are very much distinguished & musical.

B **25 to 27 points - very good sound, almost excellent**

Very good sounding midrange - natural very close to life like - very good dynamics close to perfect - small difference on the size of the instruments & voices - wind instruments almost perfect - gives a good feeling of music - you feel that something is missing
The sounds from different Cymbals, Foot Cymbals, Brushes, are distinguished & the different tones between them are detected.
The different sound tones on the same cymbal when the stick hits on different area on it, are nearly detected.
The Lead Vocals are in front of you with some flesh and blood, & all Guitars are distinguished & musical.

C **19 to 24 points - good sound, almost no mistakes**

Correct and clean midrange sound - incorrect size of the instruments & voices - good dynamics but not enough - the s, x, c, f, a little thicker/thinner than normal.
sounds clinical, artificial, unnatural, not life like - sounds somehow correct but does not give the feeling and joy of music- mids without body
The sounds from different Cymbals, Foot Cymbals, Brushes, are distinguished & the different tones between them are **NOT** detected.
The different sound tones on the same cymbal when the stick hits on different area on it, are **NOT** detected.
The Lead Vocals are in front of you with some body behind them, & all Guitars are a little distinguished .

D **13 to 18 points - acceptable sound - some mistakes - not hard to listen to**

Midrange that is almost good - not bad to listen to - lacks dynamics - some emptiness in sound - unnatural voices & instruments - the s,x,c,f, sound a little blur or whistling - wind instruments sound a little annoying - a little twang sound - aggressive mid frequencies - not natural
The sounds from different Cymbals, Foot Cymbals, Brushes, are **NOT** distinguished & the different tones between them are **NOT** detected.
The Lead Vocals are in front of you with NO body behind them, & all Guitars are NOT distinguished .

E **7 to 12 points - poor sound and/or big mistakes**

Midrange that is too much or too little - riggings appear in one or more frequencies - emptiness in sound - completely unnatural
the s,x,c,f, sound blur or whistling - wind instruments sound annoying - twang sound - definitely not natural
The sounds from different Cymbals, Foot Cymbals, Brushes, sound too bright, or too cloudy.
The Lead Vocals sound like an empty voice in the air, & all Guitars sound too thin or too heavy .

F **1 to 6 points - unacceptable bad sound**

Very bad midrange, sounds harsh - nothing to do with music - very annoying sound
The sounds from different Cymbals, Foot Cymbals, Brushes, sound too bright, or too cloudy and very much disturbing.
The Lead Vocals sounds hard & annoying, & all Guitars sound disturbing .

G **0 points - no sound**

Additional hints:

Never score 0 and avoid to go lower than 7 unless it is absolutely necessary.

To score **A** should be the absolute midrange - maybe nobody had the pleasure to listen to it yet

To score **B** should be the almost excellent midrange achieved only in very few cars

To score **C** is a very good midrange - cannot find it in an every day car.

Mistakes or miss-adjustments in the crossover area should normally result in lower scoring on both Mid-bass and Midrange sections, and/or Midrange and High Frequency sections. Never score 0 if there is a sound, and avoid to go lower than 7 unless it is absolutely necessary.

High Frequencies - 3000 Hz to inaudibility (0 - 30)

Instruments : Voices, Woodwinds, Piccolo, Flute, Clarinet, Strings, Violin, Triangle, Brushes, Harp, Piano, Organ, Bells, Tom Tom, Cymbals, High Hat, Ride, Shaker, Rattle Snake, Harp

A **28 to 30 points - excellent, realistic sound**

Excellent life like effortless highs, fast with endless dynamics, gives the size body of the instruments & voices- realistic and natural - wind instruments & cymbals give perfect sound - fills the place with music - sounds warm and makes you feel the music - sense the air and the room around the instruments - a joy to listen to

The sounds from different Cymbals, Foot Cymbals, Brushes, are very distinguished & the different tones between them are detected very clearly

The different sound tones on the same cymbal when the stick hits on different area on it, are very clearly detected.

The Lead Vocals are in front of you with flesh and blood, & all Guitars are very much distinguished & musical.

B **25 to 27 points - very good sound, almost excellent**

Very good sounding highs - natural very close to life like - very good dynamics close to perfect - small difference on the size of the instruments & voices - wind instruments almost perfect - cymbals almost natural - gives a good feeling of music - you feel that something is missing

The sounds from different Cymbals, Foot Cymbals, Brushes, are distinguished & the different tones between them are detected.

The different sound tones on the same cymbal when the stick hits on different area on it, are nearly detected.

The Lead Vocals are in front of you with some flesh and blood, & all Guitars are distinguished & musical.

C **19 to 24 points - good sound, almost no mistakes**

Correct and clean Highs - incorrect size of the instruments & voices - good dynamics but not enough - nothing annoying but sounds clinical, artificial, unnatural, not life like - the s, x, c, f, sound a little thicker, or a little thinner than normal - sounds somehow correct but does not give the feeling and joy of music.

The sounds from different Cymbals, Foot Cymbals, Brushes, are distinguished & the different tones between them are **NOT** detected.

The different sound tones on the same cymbal when the stick hits on different area on it, are **NOT** detected.

The Lead Vocals are in front of you with some body behind them, & all Guitars are a little distinguished .

D **13 to 18 points - acceptable sound - some mistakes - not hard to listen to**

Highs that are almost good - not bad to listen to - lacks dynamics - some emptiness in sound - unnatural voices & instruments -

the s,x,c,f, sound a little blur or whistling - wind instruments sound a little annoying - cymbals sound a little blur or annoying - aggressive highs

The sounds from different Cymbals, Foot Cymbals, Brushes, are **NOT** distinguished & the different tones between them are **NOT** detected.

The Lead Vocals are in front of you with NO body behind them, & all Guitars are NOT distinguished .

E **7 to 12 points - poor sound and/or big mistakes**

Highs that are too much or too little - riggings appear in one or more frequencies - completely unnatural - cymbals sound blur or annoying -

the s,x,c,f, sound blur or whistling - wind instruments sound annoying - definitely not natural

The sounds from different Cymbals, Foot Cymbals, Brushes, sound too bright, or too cloudy.

The Lead Vocals sound like an empty voice in the air, & all Guitars sound too thin or too heavy .

F **1 to 6 points - unacceptable harsh sound**

Very bad highs, sounds harsh - nothing to do with music - very annoying sound

The sounds from different Cymbals, Foot Cymbals, Brushes, sound too bright, or too cloudy and very much disturbing.

The Lead Vocals sounds hard & annoying, & all Guitars sound disturbing .

G **0 points - no sound**

Additional hints:

Never score 0 and avoid to go lower than 7 unless it is absolutely necessary.

To score **A** should be the absolute highs - maybe nobody had the pleasure to listen to it yet

To score **B** should be the almost excellent highs achieved only in very few cars

To score **C** is a very good highs - cannot find it in an every day.

Mistakes or miss-adjustments in the crossover area should normally result in lower scoring on both Midrange and High Frequency sections

Never score 0 if there is a sound, and avoid to go lower than 7 unless it is absolutely necessary.

5.5 Spectral Balance

5.5.1 Overall Spectral Balance (0 - 30 points)

Here we judge all the above (Sub, Midbass, Midrange, & Highs) as a whole - as one thing.
How all the frequencies - the entire bandwidth - are combined together. How is the sound as a total. Are they well linked together, or not ?

TRACK 8 : WHAT THE FUNK

Powerful Rock 'n' Roll Track with many dirty Guitars, Rock Drums, Sax and great E-Bass.
This is an overdub recording, with heavy compression on everything. Chorus on crunch and clean guitars, reverb on solos.
Sounds full and rich, with a little touch on low frequencies.
Power-Drums. Many different Guitar-Effects. Clean Cymbals. Strange Sax at 1:19 Min that fades out with an echo.
You should be able to hear all instruments very clearly.
Every instrument should sound very natural & distinct, without effecting the sound of another.

CLEAN GUITARS : L & R.					MID	TW
HEAVY GUITARS : L & R.					MB	MID TW
CLEAN RHYTHM GUITAR : 88% L.					MB	MID TW
CRUNCH SOLO GUITAR : 88% R. with chorus effect					MB	MID TW
SOLO GUITAR : C					MB	MID TW
SAXOPHONE : C						MID TW
PHASER : 76% R. (only on track 19)						MID TW
PAD INTRO : From L to R. Starts very quietly close to R & fades out very fast close to C.Then louder from L travels to C & fades out slowly close to R. Then back to L fading out to C.						MID TW
DRUMS :					SUB	MB MID TW
BASS :					SUB	MB

A 28 to 30 points
Excellent life like effortless sound, fast with endless dynamics, gives the size body of the instruments & voices- realistic and natural - fills the place with music - sounds warm and makes you feel the music - sense the air and the room around the instruments - a joy to listen to
Everything sounds very clear, musical, warm, natural, and all instruments are very much distinct.
All the details (even the tiny ones) of music are there, nothing is missing, nothing is too much or too little.

B 25 to 27 points
Very good balance, almost excellent
Very good sounding - natural close to life like - very good dynamics close to perfect - small difference on the size of the instruments & voices - wind instruments almost perfect - cymbals almost natural - gives a good feeling of music - you feel that something is missing
Everything sounds clear, musical, natural, and all instruments are quite distinct
Almost all the details of music are there, may something small is missing, or something is just a little too much

C 19 to 24 points
Good balance, only small deviation/colorations
Correct and clean sound - incorrect size of the instruments & voices - good dynamics but not enough - nothing annoying but sounds clinical, artificial, unnatural, not life like - the s, x, c, f, sound a little thicker, or a little thinner than normal - sounds somehow correct but does not give the feeling and joy of music.
Everything sounds just a little clear, a little musical, and you need to concentrate in order to find some distinction between instruments.
Most of the details of music are there, but some are missing, or some are too wide.

- D 13 to 18 points**
 Acceptable balance, sound that is not hard to listen to, some deviations/colorations, e.g. bass quite loud, or quite low
 Sound that is almost good - not bad to listen to - lacks dynamics - some emptiness in sound - unnatural voices & instruments - the s,x,c,f, sound a little blur or whistling - wind instruments sound a little annoying - cymbals sound a little blur or annoying - Everything sounds somehow clear, with NO distinction between instruments.
 Some of the details of music are there, but some are missing, or some are too wide.
- E 7 to 12 points**
 Poor balance, parts of the spectral balance are clearly covered by others
 Sounds too big or too small - riggings appear in one or more frequencies - completely unnatural - cymbals sound blur or annoying - the s,x,c,f, sound blur or whistling - wind instruments sound annoying - boomy - not clean sound - definitely not natural
 Everything sounds NOT clear, and 2 or more instruments sound like one.
 Most of the details of music are not there.
- F 1 to 6 points**
 Unacceptable balance - Hard to detect that there is a reproduction of the entire spectral balance
 Very bad sound, sounds harsh - nothing to do with music - very annoying sound - blur - boomy - muddy
 Everything sound bad and very much disturbing.
- G 0 points - No sound**

5.5.2 Overall Spectral Balance at higher volume (0 - 30 points)

The same as the above 5.5.1 but at 3db louder volume level.
 It fades out after a while.

TRACK 9

Same track as track 8, but recorder at 3db higher volume.

I suggest the judges to step up the volume by at least 2 steps. This may vary from head unit to head unit.

Judge it the same way as above

Additional hints:

Although it appears so, Overall Spectral Balance **is not** a point average, given to Sub-bass, Mid-bass, Midrange & High frequencies

Small point differences between Sub-bass, Mid-bass, Midrange & Highs, gives a point result in Overall S B that looks like a point average of the above.

Big point differences between Sub-bass, Mid-bass, Midrange & High frequencies, can give a lot lower points in Overall Spectral Balance

Overall Spectral Balance scoring, **can never be higher** than the highest point in Tonal Accuracy

Overall Spectral Balance scoring, **can be lower** than the lowest point in Tonal Accuracy

Examples:

1.All points in Tonal accuracy in section **C** will result points in Overall Spectral Balance in section **C** too, or high in section **D**

2.Points in Tonal Accuracy in **C** & **D** will result points in Overall Spectral Balance definitely in section **D** or below.

If tracks 4 & 5 give results in TA low in D but tracks 6 & 7 high in C then The OSB should give results close to lower in D

If tracks 4 & 5 give results in TA in C and tracks 6 & 7 in C then The OSB should give result close to the higher in C

Your final decision should be made with tracks 8 & 9 which may result to a little lower or little higher points, than listed above.

Never score 0 if there is a sound, and avoid to go lower than 7 unless it is absolutely necessary.

5.6 Listening pleasure

5.6.1 Listening pleasure (0 - 25 points)

The pleasure and the joy that music can generate to the listeners.

0 to 25 points - Start always at **12** point level which is defined as average listening pleasure.

Add 1 or 2 points for each one of :

- real listening pleasure
- realistic dynamics
- enjoyment to listen to
- naturalness (natural authentic reproduction)
- get the feeling to move your feet / make your fingers snaps
- atmosphere
- transparency (like an open window to the sound)
- rhythm and pace (real energy in the music)

Deduct 1 or 2 points for each one of:

- unrealistic - missing dynamics
- stressful sound
- artificial reproduction of the music
- boring impression
- tiring to listen to
- unnatural
- no atmosphere
- muddy or empty sound

The scoring here seems to have a connection with the Overall Spectral Balance scoring.

These 2 scorings are not directly connected but the actual scorings **cannot** be far away from one another under normal circumstances.

You must score Listening pleasure from a different point of view.

Do you get pleasure from the music you are listening to ? Or you do not.

If yes you score above 12, if not under 12.

Under most cases Listening pleasure will score proportional to Overall Spectral Balance points at higher level.E.g. SB=20p LP=16p

It can be that a system not so good in SB gives some listening pleasure & can score proportionally a little higher.E.g. SB=18p, LP=15p

It is not realistic to score 18 on the Overall Spectral Balance, and score 20 on Listening pleasure

It is not realistic to score 28 on the Overall Spectral Balance, and score 15 on Listening pleasure

A sound system that sounds very good or excellent, should be able to show it through out the whole score sheet.

On a sound system that does not sound so good, you have to point this out in detail through out the score sheet

Avoid to score below 5, unless it is absolutely necessary

5.7 Adjustments to Score

TRACK 9 : after sec 0:45 starts fading out - Do not change the volume of the system. **Track 10**: Zero Bit Track

5.7.2 Engine-off Testing - Switching Noise (-6 - 0 points)

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. Zipper, 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. A noise that is emulated from or by the audio system, the vehicle or the vehicle environment and that is not recorded on the EMMA Sound Quality CD.

Potential noises can be:

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

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

How to judge:

- 0 points** - No audible noise
- 1 to -2 points** - Barely audible noise
- 3 to -4 points** - Audible noise
- 5 to -6 points** - Disturbingly audible noise

5.7.4 Engine-on Testing (-6 - 0 points)

Noise that is generated by the mechanical/electrical system of the vehicle that is reproduced through the speakers with the audio system turned on / off. Track 10 is used. The judges will adjust the volume level from medium to maximum. If the noise increases the judges may deduct maximum 6 points.

Possible noises are:

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

How to judge:

1. Turn off the system
2. Turn on the engine
3. Turn on the system
4. Turn on and off the lights, alarm lights, air condition, brakes, electric windows, etc.
5. Accelerate the engine

How to score:

- 0 points** - No audible noise
- 1 to -2 points** - Barely audible noise
- 3 to -4 points** - Audible noise
- 5 to -6 points** - Disturbingly audible noise

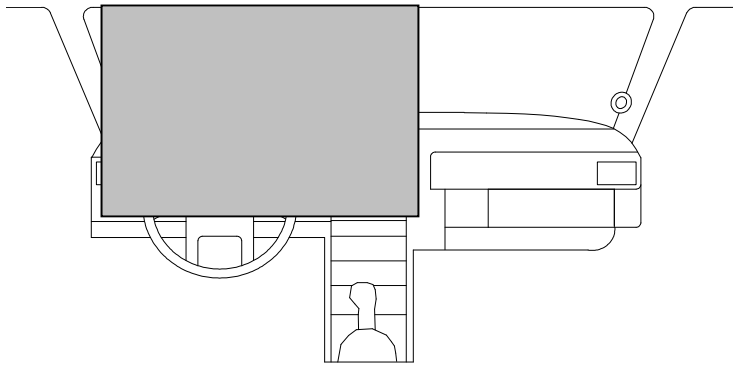
5.8

Ergonomics

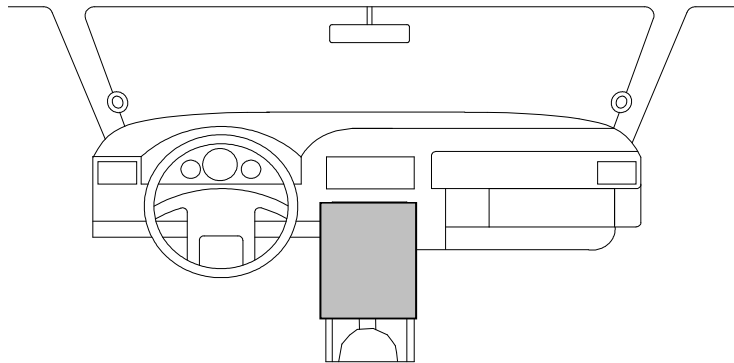
5.8.1

System Handling (0 - 6 points)

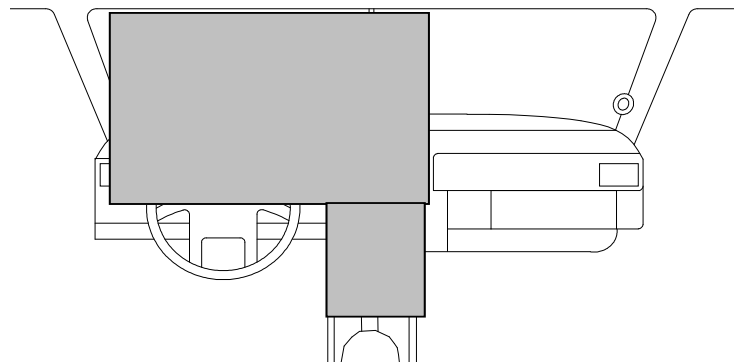
System Handling - Visibility (0 - 3 points)



3 points when in this grey area



2 points when in this grey area



1 point when outside of this grey area
0 point for very bad visibility or NO display

System Handling - Control (0 - 3 points)

3 points - Very easy to access and operate the system. (Extra Remote) Controls can be adjusted with hands on the steering wheel. (Extra Remote) control unit should be proper mounted (should not move when adjusting).

2 points - Easy to access and operate the system. (Extra remote) control is installed and properly mounted (should not move when adjusting). A loose handheld remote control is not accepted.

1 point - Easy to access and operate the system. No remote control

0 point - Hard to access and operate the system. Source unit out of reach

LAST BUT NOT LEAST

EXPLANATIONS TO THE COMPETITORS

**Your conversation with the competitor should be done in a very kind & polite way.
Please choose your words in such a way that are not offensive for the competitor.**

**You should explain in a simple & fast way, the points that you gave for this system.
Your explanations should be done in a way that the competitor understands them.**

**The competitor may not know what is a phase deference and how many points that causes.
Never use brand names, or installer's names while explaining.**

**But you can point out to him, another car -NOT FROM HIS CLASS -that sounds good in order to hear the difference
Never say to the competitor that his system sounds very good but you gave him on SB 18 points.**

Sounds very good = close to the top, for the competitor.

So, choose your words very carefully.

Otherwise, we are going to have troubles, just because we are not able to explain correctly our judging.