

## 2007 USACi SQ Rules

This section of the USACI rule book was written by the USACI Rules & Ethics committee in order to retain the basic ideas that have always made auto sound competition fun and fair. Each year, USACI hosts a membership meeting to gain input from its competitor members, the goal being to make the contests fair, fun and challenging. This rule Book and any subsequent refinements are the result of those meetings. It is USACI's sincerest hope that these rules will be received as an example of the organizations continuing efforts to promote the auto sound industry.

The rules set forth in this section of the rule Book shall be used by the USACI official(s) and/or judging staff at all USACI Sanctioned events. It is the responsibility of event officials and staff to adhere to these rules to the best of their ability. In consideration of that, each competitor should read this manual and have a thorough understanding of its contents when designing or improving a competition mobile audio system. Ultimately, it is the competitor's responsibility to know and adhere to the rules contained herein.

USACI reserves the right to make written amendments to this rule Book without prior written notification to its members. USACI will however, make every effort to notify active members via the internet and/or by distributing any written changes during the registration process of a sanctioned USACI contest. All competitors and enthusiasts are encouraged to visit our web site at [www.usaci.org](http://www.usaci.org) for rules updates, event schedules and event results.

Best regards,

Ralph L. Randall

President, USACI

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# I. USACI ADVANCED GENERAL RULES

## 1. Division as Expert, Advanced Pro, or Advanced Consumer

### **Advanced Expert:**

Advanced Expert classification is:

- anyone that works for a manufacturer or manufacturer's representative or
- is paid (compensation for services) to run a specific manufacturer's product or
- receives monetary compensation from a manufacturer or representative, excluding reimbursement for travel.
- He or she has won the USACI World Finals 2 times in a row as a Advanced Pro and been reclassified to Advanced Expert by USACI or
- a competitor who does not meet any of the previous conditions may compete as a Advanced Expert by choice.

Note: This compensation also includes anyone directly paid by the office of the President of USACI director of the USACI organization. This rule does not apply to judges receiving compensation for their judging services.

### **Advanced Pro:**

A USACI competitor must compete in the Advanced Pro division if he or she meets one or more of the following conditions:

- He or she works for a car audio dealer, or
- receives compensation for using a specific manufacturer's equipment, (free equipment) or
- a competitor's immediate family member meets one or both of the previous conditions or
- He or she has won the USACI World Finals 2 times in a row as a Advanced Consumer and been reclassified to "Advanced Pro" by USACI or
- a competitor who does not meet any of the previous conditions may compete as a Advanced Pro by choice.

### **Advanced Consumer:**

If a competitor chooses to compete in the Advanced Consumer division, the competitor must be free of all of the above conditions for a complete competition season. Logical exceptions for a competitor to compete in the Advanced Consumer division while an immediate family member is in the car audio business will be considered by the USACI Board. Requests for such an exemption must be presented in writing by the competitor and answered in writing by the USACI Board. Such an exemption might be approved in this scenario: The competitor's brother has a store in Boise City, Idaho, yet the competitor can show proof of retail purchase of equipment near his or her own home in Atlanta, Georgia.

Any competitor who competes in USACI will be required to compete in the equivalent or higher classification or division as they are competing in at other legitimate sanctioning bodies. Additionally, any competitor that wins 1st place at the USACI World Finals two times will be required to move up to the next higher division before starting the next competition season. There will be no grandfather for this clause and it will apply to all previous years world champions.

Note: USACI reserves the right not to recognize any car audio-sanctioning body.

## **Sound “Q”**

“Q” is a competition format designed to highlight the “sound quality” of a system. The “Q” division will consist of the sound quality section of the advanced score sheet and a limited number of basic safety questions on the install portion. This class will have is an open power class at all local events. The class will be split to pro and consumer at regional and finals only.

Note: USACI reserves the right not to recognize any car audio-sanctioning body.

### **2. Divisions:**

Consumer - open

Pro - open

### **3. Event Registration**

Event registration will generally begin approximately one hour prior to the stated beginning time of the contest. After the contest has begun, the event director, at his or her discretion may accept late registrations and opt to add a surcharge to the stated event registration fee for late registrants if he or she so desires. Each vehicle can be entered and judged in only one power class

### **4. Event Judging Order**

At USACI sanctioned events an Advanced Consumer, Advanced Pro and Advanced Expert competitor's vehicle shall be judged using four judging stations:

1. Verification
2. Installation
3. Sound Quality
4. Sound Pressure Level Testing (SPL)

For detailed descriptions of each judging station, please refer to the sections following General Rules. The head judge reserves the right to omit any judging stations before the event due to extenuating circumstances.

Except for USACI Regional and World Finals events, there will be no specific order in which competitors must be judged. A registered competitor may enter the vehicle in the judging line whenever he or she wishes, so long as there are other vehicles being judged. Judging will end when all vehicles are judged. It is the competitor's responsibility to have the vehicle in the judging line before the judging ends. No score and no refund will be given to a competitor who fails to have their vehicle in the judging line before judging has ended. Any competitor who allows more than a 5 minute “gap” between cars at the first judging station will have 5 points deducted off of their score sheet. This 5-point deduction will apply to all vehicles in line after this competitor. If a competitor allows a 10-minute gap there will be a 10-point deduction and so on, until a maximum of 20 points is deducted. This will be referred to the “5 minute rule”

USACI Finals will have in place judging. There will be a specific order in which competitors must be judged. A competitor's place in the judging line shall be determined by the order in which they are placed in their position in the judging area. Once a competitor is placed in the judging area, he or she will be expected to stay in the spot in which they were placed. No "line jockeying" will be permitted to try to gain a more favorable line position. Competitors who fail to remain in their assigned position may be disqualified from the event and no refund will be given. Also, at World Finals there will be a specific "cut off" time when competitors are no longer allowed to be placed in the judging line. If a competitor misses this cut off, that competitor will be disqualified from the event and no refund given. This cut off time will typically be advertised on the event flyer or at the event in or near the USACI registration booth.

*Note: USACI reserves the right to change these judging guidelines.*

## **6. Multiple Judging Lines**

Some USACI events with a larger number of competitors may form two or more judging lines, (each having their own judges), in order to expedite the judging process. In such cases, all competitors in a particular power class will be judged in the same line while other competitors may be judged in a different line. If an event is scheduled for more than one day, then all competitors in a particular power class will be judged on one day only. Whenever possible USACI Basic, Intermediate, and Advanced division competitors will also be judged on the same day respectively.

## **7. Driving the Car Through**

At most USACI sanctioned event shall conduct judging with each competitor's vehicle being driven through a judging line in an orderly fashion under its own power. This means that pushing, towing, etc., will not be allowed after the vehicle has entered the judging line under its own power. Emergency situations will be evaluated on the spot by the head judge. The term Competitor normally applies to the vehicle's owner, an employee of its owner, or an immediate family member thereof. The competitor shall be responsible for his or her vehicle and audio system and any damage resulting from their use or misuse.

If a competitor is unable to attend an event the competitor may designate someone else to drive the vehicle through the judging line. Also a USACI Basic competitor may not designate a Advanced Consumer or Advanced Pro or Advanced Expert competitor and a Advanced Consumer competitor may not designate a Advanced Pro or Advanced Expert competitor and so on to run their vehicle through. The designated person will be considered a competitor and will assume all responsibilities of such. If a competitor is unable to present the vehicle due to handicap or other extenuating circumstances, that competitor may appeal to the USACI Rules and Ethics board for a presentation exemption. If an exemption is awarded, the competitor who owns the vehicle MUST be with the vehicle while it is being judged. The competitor will be required to show the head judge and/or the event director the official exemption at every event.

A competitor is allowed to have only one other person with him or her once the vehicle is in the judging lane. This other person should be the assistant or helper. If a competitor does not comply with this rule, a five-point deduction may be assessed for each infraction. Additionally, the competitor is responsible for the conduct of his or her helper. If any helper is found to be disruptive or unruly during the event, the competitor will be penalized.

A competitor will not be allowed to enter the same vehicle more than once in the same event and may only enter one power class. Each vehicle will be judged only once, unless the head judge deems it necessary to re-judge the vehicle to preserve the integrity of the event. However, a competitor may enter another vehicle in the same event, but only if it is in another power class.

All "Vehicles" must be licensed and "Street Legal" as per federal regulations. Vehicles that do not comply will be judged in the Advanced Expert class. USACI will require all of the following OEM equipment to be installed as installed from the factory and function as originally intended. This equipment must remain installed on the vehicle at all times while being judged:

Headlights (OEM style and location)	Tail lights
Blinkers (front and rear)	Speedometer
Emergency brake	Windshield wipers

OEM or equivalent commercially available automotive seats. (no boat or home made seats)

### **8. In Case of a Tie**

In the rare event that two or more competitors in the same power class receive the same total score, the winner of the tie will be determined by the highest Sound Quality score. If the competitors have the same Sound Quality score, the winner will be determined by the highest Installation score. If a tie still exists the SPL score will be used. If a tie still exists, the head judge will flip a coin to determine the winner.

### **9. Best of Show/People's Choice**

Best of Show is optional at the promoters discretion and may not be offered at all events.

The highest total number of points each competitor received determines a Best of Show winner, excluding only the SPL score. In the event of a tie, the guidelines in "Section 8 In Case of a Tie" will be used (excluding SPL scores)

If a USACI event is judged using multiple lines and competitors from a single division are forced to compete in separate judging lines, then a judge-off will be used to determine the Best of Show winner. The competitor with the highest total score, excluding SPL scores, from each division per judging line shall be eligible for the judge-off. If an event is scheduled for more than one day, then one competitor, per division, per judging line, per day, shall be eligible for a Best of Show judge-off. Advanced Expert and USACI Basic Competitors are not eligible for Best of Show unless announced by the event coordinator before the show.

A Best of Show judge-off is determined by selected Installation and Sound Quality judges combined from the event. All eligible competitors will be asked to return their vehicles to the judging area. Each judge will have one vote to be cast for the vehicle of his or her choice per division or award. The competitor's vehicle with the majority of votes will be determined to be the winner. Installation judges should evaluate the vehicle's Installation only and Sound Quality judges should evaluate the vehicle's Sound Quality only. In the event that more than two cars are eligible and a majority winner cannot be determined, then the vehicle with the least number of votes should be eliminated from the judge-off and votes should be recast. If an unresolved circumstance should still exist, then it shall be the Head Judge's responsibility to select a winner based on overall system appeal. Best of Show awards do not carry any point value toward qualification for the USACI World Finals.

An event promoter may also choose to offer the people's choice award in lieu of Best of Show or in addition to Best of Show. The People's Choice award will be given to the competitor who has the most number of spectator votes for his or her vehicle. This format is all about crowd appeal and competitors are encouraged to reach out to the crowds and "sell" their vehicles to the crowd.

## **10. System or Vehicle Malfunctions**

An equipment or vehicle malfunction is the competitor's responsibility. A competitor shall be allowed a maximum of five minutes to correct or repair any malfunction. After five minutes have expired, the vehicle must be judged if possible or given a no score. Repeated repairs will not be allowed. Also, no repairs will be allowed after SPL testing has started. No refunds will be given.

## **11. Basic Vehicle and Audio System Requirements**

If a competitor's audio system does not, in the Judge's opinion, meet all of the following basic requirements, the competitor may be disqualified from the event. The vehicle and audio system must be fundamentally safe for the judging area. The audio system must consist of components which use some form of 12 VDC Negative ground power supply. The vehicle and audio system must be capable of operating under its own power as a whole, while in the judging area and otherwise. The vehicle must present some form of enclosed environment in which the audio system's Sound Quality may be evaluated.

## **12. USACI Judges**

USACI judges shall be appointed by the Head Judge. The judge must be directly related to the car audio industry, either by job position or by substantial experience as a Advanced Consumer competitor. Any USACI member may be pre-approved to act in a judging position by becoming a USACI certified judge. Such certification should be requested by contacting the USACI headquarters. A USACI judge may not compete in sound quality at any event if he or she is on the judging staff.

A USACI judge shall not be allowed to judge in any subjective judging station, such as Installation or Sound Quality, if a close relation of this judge (immediate family member, employee, employer, or substantial customer) is competing in that event and would have to be evaluated by that USACI judge. Verification and SPL judging stations are not considered to be subjective and are excluded from this rule. It shall be the Head Judge's or other USACI official's authority to decide the application of this rule to any such disputes.

## **13. Competitor Conduct**

It is the competitor's responsibility to have fun. A competitor does not have the right to infringe on someone else's rights, especially not on those who have the burden of keeping an event running smoothly. While being in a bad mood or discourteous will generally reflect in the scores a competitor receives, being rude or disruptive in a Judge's opinion shall be just cause to disqualify the competitor. If the root cause of the disruption is suspected to be alcohol or any other controlled substance, the competitor will be banned from all USACI events for a minimum of one year. A competitor will also be held responsible for any person(s) accompanying him or her to the event. The event sponsor also has every authority to press charges according to local law.

Absolutely no weapons are allowed in the possession of any competitor or any person(s) with the competitor, or in the competitor's vehicle. If a competitor does not comply with this rule, this person shall be immediately disqualified. Also, the competitor shall be banned from ALL future USACI events if, in the Head Judge's opinion, there is even a casual threat involving a weapon made toward a competitor, judge, sponsor, or USACI official for any reason. No refunds will be given for being disqualified.

## **14. Appealing a Decision**

If a competitor feels that he or she has been misjudged or wishes to seek clarification of a decision, only the competitor may appeal to the judge that judged that section. If the judge is unable to resolve the matter, the appeal will be turned over to the Head Judge (only the competitor may appeal to the Head Judge).

The Head Judge's decision shall be final. Appeals should be of a substantial nature and not based on score comparisons. Repeated or insubstantial appeals will only be considered disruptive to the event. Any competitor, or group representing the competitor, that is deemed unruly or disruptive to the event, may result in the competitor being penalized or asked to leave the event premises.

A competitor may write the USACI office to appeal a Head Judge's decision or a rule. If the appeal is justified, the USACI Board will send the appropriate reply to the competitor and any persons involved. Neither USACI nor an event sponsor assumes responsibility for any awards or prizes previously awarded to another competitor.

## **15. Disobeying the Rules**

The rules and guidelines in this section of the rule book apply to all USACI SQ competitors. If a competitor feels that another competitor or judge is disobeying or disregarding any of these rules and guidelines, they may bring the situation to the Judge's or Head Judge's attention in a very polite manner. If the concerned competitor is discourteous, disruptive, or the complaint is without value, the competitor may be subject to penalization for being disruptive to the event. It is the competitor's responsibility to know the rules contained in this book and follow them.

If a competitor has made a plausible complaint, involving any unfair or illegal item which may be hidden in another competitor's vehicle in the same power class and division, and would require disassembly of that vehicle or audio system to verify its existence, then the complaint must be accompanied by a cash security deposit. (no checks) Such complaints may only be made after the vehicle in question has been judged at that event and before any prizes are awarded. The security deposit required to file a protest at a Regular or Double Points event will be \$500. Regional, Triple, and finals events will be \$1000.

The Head Judge must have the security deposit in hand before any action may be taken. The Head Judge would then appoint two qualified persons to disassemble the vehicle for inspection. The competitor whose vehicle is in question may elect not to have their vehicle inspected by disqualifying themselves from the event with no refund. If, in the Head Judge's opinion, the vehicle in question is found to be inconsistent with this rule book, the cash security deposit will be returned to the competitor making the complaint and the competitor in question may be disqualified from that event and all future USACI events for a period of two years. If an inconsistency is ruled to be unintentional, then the competitor in question may only be disqualified from that event. If in the Head Judge's opinion, no inconsistency is found in the vehicle in question, then the cash security deposit will be awarded to the competitor whose vehicle was inspected and it will be the responsibility of the competitor who was protested to reassemble the vehicle or audio system.

## **16. Qualifying for Finals**

All competitors must be a USACI member in good standing before any event points can be applied for finals. Each USACI member in each division must have at least 120 event points to qualify. If a competitor chooses to move power classes during the year, accumulated event points will carry to the new power class. A competitor must obtain at least 50 of his or her qualifying

points in the power class they wish to enter at finals. Event points shall be awarded at all USACI events according to the following schedule:

1. Standard USACI Events:

- 1st place = 15 event points
- 2nd place = 12 event points
- 3rd place = 10 event points
- All Other = 5 event points

2. Regional USACI Event:

- 1st place = Finals Invitation
- 2nd place = 40 event points
- 3rd place = 35 event points
- 4th place = 30 event points
- 5th place = 25 event points
- All Other = 15 event points

Note: Event judges may receive points for judging an event. Memberships must be current and the judge must be currently certified. Judging points will not be counted toward special awards at the end of the year but may be used to earn points to compete at finals.

Note: Competitors who do not have enough points to qualify for finals in a class/division may elect to compete in the Expert class at finals.

#### **IV. VERIFICATION JUDGING CRITERIA (5 points max)**

A USACI competitor's vehicle shall be inspected by the Verification judge to ensure that the vehicle and audio meets the Basic Requirements as outlined under USACI General Rules. If, in the judge's opinion, the vehicle or system does not meet all of these Basic Requirements, the judge may bring it to the Head Judge's attention, and by the Head Judge's decision, the competitor may be disqualified from the event. The competitor's entry fee may be refunded if it is not a Regional or Final event.

##### **A. POWER SOURCE DESIGN**

**Battery(ies) Mounted Securely (0 to 3)** - Every battery in the vehicle should be secured. A battery that is mounted securely should not allow the base of the battery freedom of movement in any plane of motion. A battery that will not move at all will warrant a 3. A battery that moves slightly but less than one inch in any direction will warrant a 2. A battery moves more than one inch but is secured as to not be deemed hazardous will warrant 1. All other will be awarded 0.

**Battery(ies) Properly Vented (0 or 3)** - Every battery in the vehicle should be properly vented to outside air. The buildup of poisonous and explosive gases given off while a lead acid battery is charging can be very dangerous. If a battery is mounted in an open engine compartment or ventilated by a forced air ventilation system with the output completely capable of moving the gases to the outside of the vehicle it will be awarded full points. Totally enclosing batteries in an open engine compartment defeats the purpose for ventilation therefore not allowing maximum points to be awarded to the competitor. The alarm battery backup will NOT be scored in this section. "Bat Cap" and other slow discharge type devices will be considered batteries and must be vented like a battery.

**Upgraded Battery System (0 or 3)** - Any aftermarket battery upgrade over the OEM rating will be considered sufficient and be awarded full points. USACI recommends the battery system be improved to exceed the peak current demands of the audio system but this is not required.. This can be accomplished by simply upgrading the factory battery and retaining a single battery system for a low wattage audio system. One or more auxiliary batteries are suggested for a higher wattage audio system. Multiple batteries will always be considered upgraded even if factory batteries are used. The minimum amount of suggested battery current (measured in amperes according to a battery's cranking amps rating) would be detailed in Appendix B.

**Upgraded Charging System (0 or 3)** - Any aftermarket alternator upgrade over the OEM rating will be considered sufficient provided the charging lead has been upgraded to match the alternators output. A high output rewind of the stock alternator will also be considered sufficient for full points. A valid receipt is required to show proof of such a rewind. USACI recommends the charging system be improved to exceed the peak current demands of the audio system. More than one aftermarket high output alternator would be suggested for a high wattage audio system. (See Appendix C.) Example: If a vehicle with a 250 watt system were equipped from the factory with a 60 amp alternator, a 70 amp alternator would be considered adequate for points but a larger upgrade would be suggested for optimum system performance. It is the competitor's responsibility to supply the proof of stock alternator value and upgrade in order to receive full points in this category.

**Creativity of Power Source (0 - 5)** - Points will be awarded for a power source design that exhibits creativity. Creativity is considered any ideas that are out of the ordinary based on other vehicles at the same event. Because the overall caliber of competitors may vary, the number of creativity points awarded to the same design may also vary to some extent. Maximum points will only be awarded to the most creative installations at any given event. The creativity of all aspects of the power source will be considered, including equipment, design, and application.

## **B. Wiring**

**Power Source (0 or 3)** - Each power wire, which is connected to the positive terminal of a battery, must be fused within 18 wire inches (including all connectors, wire and protection devices) of the battery and before the wire passes through any metal. This measurement will be taken from the center of the positive battery post and terminate at the output of the fuse or a manual reset circuit breaker. Being properly fused consists of using a manual reset circuit breaker or a fuse of the proper rating. Either should have a current rating less than that of the components, including connecting wire, to which it is supplying power, to include at the positive post of multiple batteries connected together. Automatic reset circuit breakers are not acceptable. Also each fuse must maintain moderate accessibility. These rules normally apply to any circuit that supplies power to the audio system, but may also apply to a stock power lead which is deemed to be unsafe. Note: The gauge of wire being protected will decide proper fuse rating. System values will not be used to determine proper fusing values on batteries.

**Signal Source (0 or 3)** - All power wires and signal wires extending to or from the signal source and processors must be routed and terminated in an orderly fashion. All wires should be secured at regular intervals (every six inches or less to achieve maximum points.) so as to prevent irregular movement. Each power connection should be solid, free of fraying strands, and protected from accidental shorting. Signal wires should be routed away from power wires to prevent radiated noise. All wires should be routed away from separately moving parts of the vehicle. Finally, all signal source and processor wiring should be out of sight from a normal seated position.

**Amplifiers (0 or 3)** - All power wires and signal wires extending to or from the signal source and processors must be routed and terminated in an orderly fashion. All wires should be secured at regular intervals so as to prevent irregular movement. (every six inches or less to achieve maximum points.) Each power connection should be solid, free of fraying strands, and protected from accidental shorting. Signal wires should be routed away from power wires to prevent radiated noise. All wires should be routed away from separately moving parts of the vehicle. Finally, all signal source and processor wiring should be out of sight from a normal seated position.

**Power Wires Properly Protected (0 - 5)** - The wires that connect the power source components to one another and to the audio system should be protected from their environment. In a non-hostile environment, such as in an interior compartment or in the engine compartment away from all heat sources (at least a few inches), wire loom will be considered sufficient protection and awarded maximum points. However, in high heat areas or underneath the vehicle, better protection will be required. In these cases, metal or rigid plastic conduit will be considered sufficient and full points awarded. A grommet must be used at any point where a power wire passes through metal or any conductive material. Loom, or other suitable material, will be required when the wire passes through any abrasive material. Common sense will be used when evaluating and scoring this category!

**Power Wires Properly Terminated (0 - 5)** - Good wire termination techniques should be used, especially to connect the power source components. Each termination should be very solid and free of any fraying strands or corrosion. A termination should have some form of protection, such as heat shrink tubing, to protect it from corrosion. Also, each termination along the twelve-volt positive lead must have adequate protection to prevent accidental shorting to ground. A crimped or mechanical termination that has also been soldered and then protected by a sheath that completely covers the termination will be awarded maximum points!

**Power Wires Run Neatly, Safely, and Securely (0 - 10)** - All wires which connect the power source components to one another and the audio system must be routed in an orderly fashion away from all potentially damaging parts of the vehicle. Any separately moving portion of the

vehicle should be avoided as well as excessive heat sources (such as the engine's exhaust system) All wiring should be secured at regular intervals (every six inches or less to achieve maximum points.) as necessary to prevent it from irregular movement. Other engine compartment wiring which is especially dangerous or unappealing may also be included in this category.

**Creativity of Power Source and Wiring (0 - 10)** - Points will be awarded for a power source design that exhibits creativity. Creativity is considered any ideas that are out of the ordinary based on all competitors at any given event. Because the overall caliber of competitors may vary, the number of creativity points awarded to the same design may also vary to some extent. Maximum points will only be awarded to the most creative installations. The creativity of all aspects of the power source will be considered, including equipment, design, and application.

#### **D. SIGNAL SOURCE AND PROCESSORS**

**Equipment Properly Mounted (0 - 5)** - The signal source components and any additional processors, such as equalizers, crossovers, and enhancement devices, must be firmly mounted to the vehicle. The component's mounting should not allow irregular movement of the component in any plane of motion. If a component is mounted to a normally moving portion of the vehicle, then that particular portion of the vehicle will be inspected for irregular movement. Normally moving portions of the components, such as motorized faces or detachable faces, should be examined with slight force. Additionally, any source unit or processors mounted using a drywall type screw will be considered improperly mounted and will be awarded minimum points in this category.

**Equipment Maintains Theme of Installation (0 - 5)** - Each signal source or processor component should be mounted in an orderly fashion that is consistent with its surroundings. Great care should be taken to ensure that each component's mounting is free of visual imperfections. There is no set guideline stating that the component should appear to be either stock or highlighted. A competitor may choose to highlight one portion of the vehicle while another remains stealth. Consideration will be given in this matter and points may not be deducted. This division will be defined as front of vehicle ("B" pillar forward) and rear of vehicle ("B" pillar rear). In cases of vehicle with a trunk, the interior will be considered one theme area and the trunk another.

**Normally Used Equipment Easily Accessible (0 - 5)** - Any components that require adjustment or access during the normal operation of the system should be within comfortable reach when seated in the driver's position. This does not include components that are normally adjusted only when installed or inspected. Components with visual displays should also be within comfortable driver's view at or near dash level. Compact Disc changers, which by design are intended for trunk mount, need not be within reach of the driver but should be easily accessible otherwise. Also, extensive unlabeled operating components should also be avoided.

**Signal Source and/or Processor Wires Run Neatly, Safely, and Securely (0 - 10)** - All power wires and signal wires extending to or from the signal source and processors must be routed and terminated in an orderly fashion. All wires should be secured at regular intervals (every six inches or less to achieve maximum points) so as to prevent irregular movement. Each power connection should be solid, free of fraying strands, and protected from accidental shorting. A crimped or mechanical termination that has also been soldered and then protected by a sheath that completely covers the termination may be awarded maximum points! Signal wires should be routed away from power wires to prevent radiated noise. All wires should be routed away from separately moving parts of the vehicle. Finally, all signal source and processor wiring should be out of sight from a normal seated position.

**Creativity of Signal Source and Processors (0 - 10)** - Points will be awarded for a signal source and processors installation that exhibits creativity. Creativity is considered any ideas that are out of the ordinary based on other vehicles at the same event. Because the overall caliber of competitors may vary, the number of creativity points awarded to the same installation may also vary to some extent. Maximum points will only be awarded to the most creative installations.

## **E. SPEAKERS**

**Speakers Properly Mounted (0 - 5)** - All speakers in the vehicle should be securely mounted so that no irregular movement is allowed. This will include the actual driver and/or panel that the driver is mounted to. Any speaker mounted with a drywall type screw will be considered improperly mounted and will be awarded minimum points in this category. Pan head or equivalent will be required to obtain maximum points.

**Speakers Properly Protected (0 - 5)** - All speakers in passenger areas of the vehicle must be properly protected from damage during the normal use of the vehicle. If a judge can touch the cone or surround of a speaker with his the blunt end of a ball point pen then that speaker it may considered only partially protected. No grill will be considered zero points. Such protection may include, but is not limited to, an expanded mesh grill, waffle grills and so on.

Speakers located in a trunk or hatch area (in vehicles with no rear seat, the area behind the "B" pillar will be considered hatch area) must be protected from damage. All speakers in these areas should have grills with no more than 2 inched gap at any one point. Inverted sub woofers will be considered properly protected.

**Speaker Wires Run Neatly, Safely, and Securely (0 - 10)** - All wires extending to the speakers should be routed in an orderly fashion away from separately moving portions of the vehicle. The speaker wires should be secured at regular intervals (every six inches or less to achieve maximum points) to prevent irregular movement. A grommet should be securely installed at any point where a speaker wire must pass through metal or other abrasive material. All speaker wires should be hidden from view in a normal seated position. Any speaker wires that must pass outside the vehicle, such as those extending into the doors, must be encased in a protective material, such as split loom or a rubber boot to achieve maximum points.. Each speaker wire should be terminated solidly without fraying stands. A crimped or mechanical termination that has also been soldered and then protected by a sheath that completely covers the termination may be awarded maximum points provided other areas in this section achieve maximum points. Photos may be necessary for maximum points. Common sense will be used when evaluating and scoring this category.

**Speakers Maintain Theme of Installation (0 - 5)** - Each speaker should be mounted in an orderly fashion which is consistent with its surroundings. Great care should be taken to ensure that each speaker's mounting is free of visual imperfections. There is no set guideline stating that the speaker should appear to be either stock or highlighted, but it should be cosmetically integrated.

**Complexity and Creativity of Speaker Installation (0 - 10)** - The speaker installation will be awarded points based on the amount of effort put forth optimize speaker performance an mounting. This includes using basic techniques such as sound damping, mounting surface reinforcement, driver placement, complex speaker enclosures, etc. These efforts need not be unique, but should improve the speaker's performance or appearance. Points will also be awarded for a speaker installation (including enclosures) which exhibits creativity. Creativity is considered any ideas that are out of the ordinary based on other vehicles at the same event..

Because the overall caliber of competitors may vary, the number of creativity points may also vary to some extent. A speaker installation that is highly complex may also be eligible for creativity points. Maximum points will only be awarded to the most creative and complex installations.

## **F. AMPLIFIERS**

Note: If an audio system does not use any external amplifiers, but instead uses only a signal source or processor with a built-in amplifier, then the signal source or processor shall be considered an amplifier and will be evaluated accordingly.

**Amplifier(s) Properly Mounted (0 - 5)** - All amplifiers in the vehicle must be firmly mounted to the vehicle. The amplifier's mounting should not allow irregular movement in any plane of motion (up, down or side to side). If an amplifier is mounted to a normally moving portion of the vehicle or installation (fold down seats, motorized amplifier racks, and etc.), then that particular portion shall be inspected for irregular movement. Additionally, any amplification device mounted using a "drywall" type screw will be considered improperly mounted and will receive minimum points in this category.

### **Amplifiers properly cooled**

**(a) Effectiveness (0 - 5)** - This section will evaluate the effectiveness of the cooling system. The amp(s) should remain cool at all times (not too hot to touch), even during peak demand. Each amplifier in the vehicle must have adequate cooling or ventilation according to its size and location. All amplifiers, except those mounted in large open areas, will require a forced air cooling system, or better, to obtain maximum points in this category. Any amplifier(s) with functioning forced air cooling that move adequate air will receive full points. Creativity is not part of this category.

**(b) Creative Cooling Application (0 - 5)** - The designs applied to cool the amps will be considered in this section. Competitors that can demonstrate creative, effective and unique ideas to cool their amplifiers will be awarded points in this category.

**Amplifier Wires Run Neatly, Safely, and Securely (0 - 10)** - All power wires and signal wires extending to or from the amplifiers must be routed and terminated in an orderly fashion. All wires should be secured at regular intervals (a maximum of 6 inches to achieve maximum points) to prevent irregular movement. Each power connection should be solid, free of fraying strands, and protected from accidental shorting. A crimped or mechanical termination that has also been soldered and then protected by a sheath that completely covers the termination may be awarded maximum points provided other areas in this section achieve maximum points. All wires should be routed so as not to interfere with the normal use of any surrounding areas. Lastly, each amplifier must retain all manufacturer input or output protection, including speaker lead fusing. If an amplifier is protected internally, an owner's manual may be required to show proof of such protection. Photos may be necessary for maximum points. Common sense will be used when evaluating and scoring this category.

**Complexity and Creativity of Amplifier Installation (0 - 10)** - The amplifier installation will be awarded points based on the amount of effort put forth to optimize performance and appearance. This includes using ideas such as displaying amplifier wiring, stiffening capacitors, motorized amplifier racks, easy access for adjustment, special lighting, etc. These applications need not be unique, but should improve the amplifier's performance and appearance. Points will also be awarded for an amplifier installation that exhibits creativity. Creativity is considered any ideas that are out of the ordinary based on other vehicles at the same event. Because the overall caliber of competitors may vary, the number of creativity points awarded to the same installation

may also vary to some extent. An amplifier installation that is highly complex may also be eligible for Creativity points. Maximum points will only be awarded to the most creative installations.

### **G. ATTENTION TO DETAIL**

In this section the Installation judge will evaluate the system on its overall appearance - little things may count a lot. Each compartment should be clean and free of imperfections. Fabric should be turned so that all grains will match, screw heads may be aligned, panels should fit snugly, color and texture of materials should blend, contours should flow smoothly, and etc.

**Equipment detail (0 - 5)** - Special attention is paid to consistency of product colors, trim, light, lettering, texture, and alignments.

**Material detail (0 - 5)** - Special attention is paid to the detail of materials, security, safety, or adaptability.

**Application detail (0 - 5)** - Special attention should be paid to the panel fit and finish, equipment should be mounted so that it is not inconsistent (mounted straight, level, flush) with the surrounding equipment. Additionally, speakers with logos may be aligned and/or facing the same direction to score maximum points in this category.

### **H. OVERALL INSTALLATION CREATIVITY**

This category will be used to award points for creative installation techniques that directly affect the systems audio performance. Judges will not award points for items that were already considered for creativity points in other categories. No points will be awarded for items that are not directly installation related (i.e. custom wheels, custom paint, Etc....)

### **I. OVERALL SYSTEM**

**Overall cleanliness of vehicle (0 - 5)** - A clean vehicle shows both respect for the judges and the competitor's pride in the vehicle. Only a very clean vehicle will receive maximum points. Some allowances may be made for lack of cleanliness if the event is held during bad weather or with less than appropriate judging area conditions.

**Overall security of system (0 - 5)** - An audio system should be designed to deter and prevent theft. Components should be able to be disguised or hidden from a thief's view from outside of the vehicle. Speaker grills, fake radio covers, and etc. may be used for disguises. Especially solid component mounting or tamper proof fasteners may also be considered as some theft prevention.

**Ease of system maintenance (0 - 5)** - A well-designed audio system should take into account the inevitable fact that each component will require repair or replacement, sooner or later. Each audio system component must be reasonably accessible for this reason. It should not require extended periods of time, in the judge's opinion, to simply remove a component or reinstall it.

### **J. PRESENTATION**

The competitor will have 7 minutes to completely present the vehicle to the installation judge. The competitor will have 2 points deducted from the presentation score after 7 minutes has expired. 1 point will be deducted for each additional minute up to 10 minutes. When 10 minutes has expired, the competitor will be "cut off" and judging will begin. During this 7-minute period the judge(s) will not be scoring the system, but will be very attentive to the competitor. The

competitor should explain all parts of the audio system while showing their existence and function, if necessary. Photographs (or other form of media) of components or installation techniques which are not readily apparent, an audio system layout, and other diagrams (etc.) may help the competitor to more effectively present the audio system. Additional materials pertaining to the audio system may be available to the judges after the presentation period has expired.

The average score in this category shall be five points. Points may be deducted if, in the judge's opinion, the competitor lacks a general knowledge or understanding of the audio system. If a competitor is unable to present the vehicle due to handicap or other extenuating circumstances, that competitor may appeal to the USACI Rules and Ethics board for a presentation exemption. If an exemption is awarded, the competitor who owns the vehicle **MUST** be with the vehicle while it is being judged. The competitor will be required to show the head judge and/or the event director the official exemption at every event.

## **VI. SOUND QUALITY JUDGING CRITERIA**

A USACI competitor's audio system's sound quality will be judged according to the rules and guidelines in this section. Few points shall be awarded in a category if the system fails to meet the judging criteria for that category. Partial credit may be given if the system is nearly consistent with the judging criteria for that category. Maximum points shall only be awarded if the system completely meets or exceeds the criteria for that category.

The general rule for Sound Quality judging is to evaluate how well the audio system duplicates or recreates the original music performance. All musical information, including direct and reflected sound, must be recreated with accurate tonal balance. The musical information should also seem to come from the same direction and distance from the listener as in the original performance. When evaluating a very accurate audio system, the listener should be able to close his or her eyes and feel that they are actually experiencing a live performance.

A competitor will not be allowed any extra time to adjust the audio system for Sound Quality judging. A Sound Quality judge will only adjust the system's volume and use such signal source playback functions such as fast forward and rewind or tracking. All other settings will be left untouched and should be preset.

Sound Quality software, a cassette tape or compact disc (other formats may not be available), will be provided by USACI and should not be substituted during the event. It is the competitor's responsibility to ensure that the software is returned to the judging staff after Sound Quality judging is completed. If the software is not returned, the competitor will be considered disruptive to the event and appropriate action will be taken.

It shall be the Sound Quality judge's responsibility to score the competitor's audio system according to the following rules and guidelines to the best of this judge's ability. It is the competitor's responsibility to accept that the scores awarded by the judge are given in the competitor's best interest as an honest evaluation of the audio system.

The competitor must present the sound quality judge a seating position that closely approximates the normal seated position while operating the vehicle. The sound quality judge must judge the vehicle seated in the seat placement presented by the competitor. If the judge feels that this position will not allow him or her to accurately score the vehicle or is unrealistic, the head judge will determine if the seating position is unrealistic. The sound quality judge may **NOT** adjust the seat or seating position to personal tastes.

Covering any portion of the vehicle so that it blocks or restricts the OEM view out of the vehicle for any judge judging the car is prohibited.

## **K. STAGING (50 points max)**

The soundstage is an area containing all of the performers. The sound stage should have proper width, depth, and height direction. For a vehicle to receive maximum points in this category, it must accurately reproduce all components of the sound stage.

**Position: Front to Rear (1 - 10)** – The judge will evaluate where the front of the performer's stage is located. Ideally, the front of the stage should appear to start well out in front of the listener and beyond the confines of the vehicle. An audio system that exhibits "rear stage" will appear to have most or all of the audio information originating from behind the listener with very little sound originating in front of the listener. This can be likened to listening to a live performance while sitting backwards in your chair. A vehicle that exhibits rear stage will receive minimum points.

**Width (1 - 10)** – The stage's left and right boundaries will be evaluated in this category. The stage should appear to extend outside of the left and right confines of the vehicle. The stage should appear seamless from left to right with no noticeable holes or gaps. If the audio system lacks width, then the stage will sound as if all the performers are grouped closely near the center of the sound stage.

**Height (1 - 10)** – This section will evaluate how accurately the sound system recreates the proper stage height across the entire sound stage. The soundstage should appear to be at or near eye level for the listener, placed between the top of the dashboard and rear view mirror when in a normal seated position. Maximum points will only be awarded if all portions of the stage are at the proper height. If a sound stage varies in height from one area of the sound stage to another, an average of the best and worst stage height will be awarded. Example: Judging from the driver's seat, the center and right placement appear to maintain the same relative vertical position but the left placement is considerably lower than the other portions of the stage. The center/right score (10) will be averaged with the left score (2) to arrive at the final score (6).

**Depth (1 - 10)** - When evaluating a sound field that has good depth recreation, it should be apparent that some of the performers are also closer to the listener than other performers. Using the baseline obtained in the "Position" section, the judge will evaluate how well the vehicle accurately reproduces the depth of the recording.

**Balance L/R (1 - 10)** – The stage should be balanced front to back, left to right, and top to bottom. It should not sound "right side heavy" or "thin on the left side" for example. It should sound consistently proportional throughout the stage area. A stage split front to rear (the left portion of the stage originating in front of the listener and the right portion originating behind the listener or visa versa) would score poorly in this category.

## **L. IMAGING (45 points max)**

Imaging is the proper placement of the individual performers and/or instruments within the sound stage. The images on the sound stage may appear to be focused or diffused depending on the characteristics of the individual performer. These images should remain stable and not change location on the sound stage during the performance. The images should remain stable at all volumes and frequencies. Example: The lead vocals in a recording may be perceived as having a

“tight and focused” image while a piano located toward the rear of the stage may have a “broad or diffused” image

Proper image separation is important to a well-balanced soundstage. Each image should originate from its own distinct location on the sound stage. No two images should appear to come from the exact same location. The sound stage should maintain seamless transitions from one image to the next and no gaps or missing musical information should be evident.

**Left Position (1 - 8 points)** Instruments and/or performers on the left side of the sound stage should be placed in the correct locations.

**Left Focus (1 - 7 points)** Images on the left side of the sound stage should be focused and well defined. The audio information from any given performer/instrument should come from an exact point on the sound stage.

**Center Position (1 - 8 points)** Instruments and/or performers at the center of the sound stage should be placed in the correct locations.

**Center Focus (1 - 7 points)** Images at the center of the sound stage should be focused and well defined. The audio information from any given performer/instrument should come from an exact point in the sound stage.

**Right Position (1 - 8 points)** Instruments and/or performers on the right side of the sound stage should be placed in the correct locations.

**Right Focus (1 - 7 points)** Images on the right side of the sound stage should be focused and well defined. The audio information from any given performer/instrument should come from an exact point in the sound stage.

#### **M. AMBIENCE/SPATIAL REPRODUCTION (10 points max)**

This section will score the system’s ability to accurately reproduce the spatial characteristics of the room that a musical track was recorded in. The audio system should give the sensation of being in a much larger space than that allowed by the confines of the vehicle. The audio system should be able to make the physical boundaries of the listening environment transparent.

**Reproduction (1 - 5 points)** - This section will score the system’s ability to accurately reproduce the spatial characteristics of the room that a musical track was recorded in.

**Size of Space (1 - 5 points)** - The audio system should give the sensation of being in a much larger space than that allowed by the confines of the vehicle.

#### **N. DEFINITION AND CLARITY (65 points max)**

A properly designed audio system should be capable of reproducing all audible frequency ranges with clarity and definition. An audio system should not add any unnatural coloration or distortion to the original recording. Instruments or vocalists from each frequency range should appear

distinct and natural. There should be no additional resonance or harmonic overtones. Unnatural or “overly processed” sound is not desirable, as the music will lose warmth and realism.

**Low Frequencies (1–5 Normal Volume) (1–5 Above Normal Volume)** - This frequency range should not sound exaggerated in relation to the rest of the system but should blend with the other frequencies being reproduced. The musical notes should sound realistic and not have a noticeable rumble or unnatural sound. An audio system should also be able to reproduce the lowest frequencies accurately without distorting or “breaking up”. This frequency range includes the lower harmonics of the bass drum, bass synthesizer, pipe organs, etc. The system will be evaluated at normal and slightly above normal volume.

**Mid-bass Frequencies (1–5 Normal Volume) (1–5 Above Normal Volume)** Frequencies in this range should be realistically reproduced and balanced. The musical notes should be free of unnatural colorations or resonant sounds. The tones should sound realistic, accurate and precise. This frequency range includes lower vocals, snare drum, bass guitar, trombone, etc. The system will be evaluated at normal and slightly above normal volume.

**Midrange Frequencies (1–5 Normal Volume) (1–5 Above Normal Volume)** Frequencies in this range should be realistically reproduced and balanced. The musical notes should be free of unnatural colorations or resonant sounds. The tones should sound realistic, accurate and precise. Voices and instruments should sound rich and natural without being harsh, dull, compressed or distorted. The frequency range includes upper vocals, piano, guitar, keyboard, trumpet, etc. The system will be evaluated at normal and slightly above normal volume.

**High Frequencies (1–5 Normal Volume) (1–5 Above Normal Volume)** Frequencies in this range should be realistically reproduced and balanced. The musical notes should be free of unnatural colorations or resonant sounds. The tones should sound realistic, accurate and precise. The frequency range includes drummer’s high hat, cymbal, upper flute, etc. The system will be evaluated at normal and slightly above normal volume.

**Dynamics (1–5 Normal Volume) (1–5 Above Normal Volume)** – Dynamics refer to the power of tones. The dynamic range of a recording is the extremes between loud and soft portions of the music. The audio system should be able to accurately reproduce the entire dynamic range of the recorded material without sounding harsh, compressed or distorted. The system will be evaluated at normal and slightly above normal volume

**Tonal Balance (1–5 Normal Volume) (1–5 Above Normal Volume)** – The audio system must reproduce the recorded audio information without exaggerating or minimizing a frequency or group of frequencies. If a competitor were to look at the audio system’s output on an RTA meter, there should be smooth band to band transitions across the entire measured frequency spectrum without any abrupt peaks or holes in the frequency response.

**Environment (1 – 5)** - The audio system should not add any sound that is not a part of the original sound recording. Sounds such a buzzing or rattling should not be caused by the audio system during evaluation. These sounds can be added due to improperly mounted speakers, loose panels or components. If no foreign sounds are heard during audio playback, maximum points will be awarded.

## **O. NOISE (15 points max)**

**Engine Noise (1 – 3)** – The vehicle’s engine must be running and a current load must be placed on the charging system (i.e. headlights on and set to high beam, air conditioner operating, brake lights operated, etc). The judge will carefully listen for alternator whine, spark plug ticks and other noises induced by the vehicle’s electrical system. The judge should be careful to distinguish between actual alternator whine produced through the audio system and other similar noises that already exist while the engine is running. These noises may include those produced by turbo chargers, the bearings in high output alternators, and etc. By listening to the audio system both while the engine is running and while it is not, a proper evaluation of the noise source can be made.

*Note: The engine should be OFF to properly evaluate the remaining noise categories.*

**Mechanical/Fans/Actuators (1 – 3)** – This will evaluate noises other than those included in the recorded media while the audio system is playing and the engine is off.

**Turn Off Noise (1 – 3)** – All components in the system should power down silently. No clicks, buzzes, thumps or pops should be present when the system powers down.

**Turn On Noise (1 – 3)** – All components in the system should power up silently. No clicks, buzzes, thumps or pops should be present when the system powers up.

**Noise Floor (1 – 3)** – A system with an improperly set gain structure will exhibit a hiss or “static” sound at full volume playing the zero bit track. This section will be evaluated on the zero data track at full system volume. Be sure to turn the system volume down prior to removing the recorded media or changing tracks!

## **P. OVERALL SOUND QUALITY (10 points max)**

The Sound Quality judge should evaluate the overall appeal of the audio system. None of the evaluations made for previous categories should have any bearing on this section. The average score for this section is five points. An audio system that does not create an overall comfortable sound field may receive a less than average score. However, an audio system that sounds good and would be pleasurable to listen to for extended periods of time will receive an above average score.

## **VII. SOUND PRESSURE LEVEL - SPL**

If a competitor chooses to use an SPL “podium”, he or she will be required to use the same brand equipment in the podium as is installed in the vehicle with the same output voltages. This will include all processors, head units and so on. Some examples would be:

Competitor A has 2 EQT’s, a PLD1 Line driver and Pioneer M900 in the vehicle. This competitor uses a Pioneer M-900 and PLD1 Line driver in the Podium. This would be allowable.

Competitor B has an EPX2, PA1 and Alpine 7919 in the vehicle. This competitor has a Alpine 7909, PLD1 and an EQX in the podium. This would not be allowed.

*(All models and brand affiliations are used to clarify this rule)*

The SPL meter should be set to display only Max SPL and adjusted to the correct SPL range before initiating the testing. All gain or loss filters should be bypassed or set to their neutral position.

Windows, doors, and etc. can be either open or closed during this test. Doors may not be slammed or fanned during testing

The competitor will have a maximum of five minutes to make any adjustments to the audio system for this test. If the competitor is not ready for the test within the five-minute period, a minimum of ten points will be deducted. After the SPL meter has been placed and the competitor has loaded the software and readied the system, the competitor should signal the judge that he or she is ready for the test. The judge should then reset the SPL meter and ensure that all entrances are closed.

After the judge signals the competitor to begin the test, the competitor will play 30 (thirty) seconds of an official USACI SPL music track (no sine sweeps) in order to obtain a reading on the SPL meter. The music may not be restarted after judging begins. If the audio playback does not remain audible to the judge or if it is restarted (or repeated in any way) then ten points may be deducted from the competitor's SPL score. The competitor may choose to stop the SPL testing at any time before the 30-second time limit has expired but the SPL judge must be able to audibly verify that the correct disk is being used during testing. The use of tone generators, doublers or any other device that externally (outside of the closed signal chain) generates or alters the frequencies that the system is playing during SPL testing is expressly prohibited and will result in disqualification with no refund. Any competitor generating sound pressure with anything other than the provided musical software or externally influencing the SPL measuring equipment will be immediately disqualified and the incident forwarded to the USACI Rules and Ethics committee for review. Competitors found to be intentionally attempting to violate the above rules may be banned from competition for a period not less than 1 year and not more than 100 years. The decision of the Rule & Ethics committee will be final.

If the competitor feels that he or she had a system malfunction during the SPL testing, he or she may elect to retest. If the competitor elects to retest, he or she will be given 2 minutes to correct any problem(s) and retest. The result of the second retest will be the competitor's final score. The competitor cannot elect to take the "better of the two" for any reason.

While personal safety is ultimately the competitor's responsibility, hearing protection is required to be used by the competitor if he or she is inside of the vehicle during SPL testing. The competitor will be required to furnish their own hearing protection.

There is a 120 decibel maximum score (cap) for this test. The competitor's score will be based on the SPL meter's reading after the test track has been played. The competitor will receive his actual 30 second SPL score -100.

Note: Any ruling by the head judge is reversible only by a ruling of the rules and ethics board and only having been submitted by the petitioner in writing.

#### Vehicle Qualification

Please refer to the "Modified SPL" rules for specific microphone placement and vehicle interior modifications permitted.

### **VIII. SHOWMANSHIP AND BONUS POINTS**

The competitor will be encouraged to display his or her vehicle for the spectators at all sanctioned USACI events. If the competitor chooses to display the vehicle, he or she will be

required to have the vehicle on display for a period that will generally start at 1:00pm and conclude at 4:00pm to receive points in this category. The vehicle must be on display during this period unless it is in the judging lane. The head judge or event sponsor reserves the right to modify or omit this category due to inclement weather, space constraints or other reasons. Only the head judge, or another person designated by the head judge, will be judging this category. Please keep in mind that there may be space constraints that will not allow elaborate display areas to be set up. You will be informed by the head judge at the competitor's meeting of the approximate amount of space allotted for each vehicle and display. If the competitor chooses not to display the vehicle, a score of zero will be awarded in this section. At any show other than a Regional or the World Finals, scoring in this category will 0 or 10. The location and length of time required satisfying this category would be determined by the event director and covered at the competitor's meeting.

**Display (0 or 10)** - A competitor will earn 10 points in this section by simply opening the vehicle up for the spectators to look at. Typically, presenting the vehicle with all locations that have audio, or other, upgrades will be required. This will include, but is not limited to, the hood, passenger compartment, trunk and/or bed. Points will not be awarded, if in the judge's opinion, the vehicle is not easily viewable by the spectators.

**Creativity (0 - 10)** - Creativity points may be awarded for display books, labeling or signs highlighting the audio system, using lighting to highlight audio components, video (or other media) detailing the vehicle and audio system and so on. You are encouraged to stay with the vehicle, while it is on display, as the judge may award creativity points by answering simple questions about the audio system while it is on display. Maximum points will only be awarded to the most creative and original displays. Creativity is considered any ideas that are out of the ordinary when compared with other competitor's displays at that event. Because the overall caliber of competitors may vary from one event to another, the number of creativity points awarded to the same display may also vary to some extent. Maximum points will only be awarded to the most creative, informative and original displays.

Note: Creativity points will NOT be awarded without the basic display guidelines being met and points awarded in that category.

Note: Advanced Expert competitors will be required to display their vehicles for an extended period of time to satisfy the display category. The head judge or event director will discuss the display category with the Advanced Expert competitors at the event.

**USACI Decal Bonus (0 or 5)** - A competitor will be awarded 5 bonus points for prominently displaying an official USACI sticker on his or her vehicle.

**USACI Membership Bonus (0 or 5)** - A competitor will be awarded 5 bonus points for being a current USACI member. Each membership is good for 1 year from the time you join.

## **APPENDIX A. - Proper American Gauge Wire (AWG)**

Current Demand in Amperes	Up to 4'	Up to 7'	Up to 10'	Up to 15'	Up to 20'	Up to 25'	Up to 30'
0-10	20	18	16	14	14	12	12
10-25	16	14	14	12	10	10	8
25-50	12	10	10	8	6	6	4
50-75	8	8	8	6	6	4	4
75-100	8	8	6	4	4	2	2
100-150	4	4	4	2	1	1	1/0
150-200	2	2	2	1	1/0	1/0	2/0
200-300	1/0	1/0	1/0	1/0	2/0	2/0	3/0
300-400	3/0	3/0	3/0	3/0	4/0	4/0	4/0

The above chart shows the minimum copper wire size acceptable for normal wire lengths used in a vehicle to meet normal current demands. If aluminum wire or tinned wire is used, the wire gauge size should be even larger to compensate. The wire size calculations are intended to allow no less than .5 voltage drop to a circuit, assuming that the wire is properly terminated.

### APPENDIX B. - Upgraded Battery System

Total RMS Wattage of System	Minimum Battery Current	Total RMS Wattage of System	Minimum Battery Current
0 - 50	675	1100 - 1200	1250
50 - 100	700	1200 - 1300	1300
100 - 150	725	1300 - 1400	1350
150 - 200	750	1400 - 1500	1400
200 - 250	775	1500 - 2000	1450
250 - 300	800	2000 - 2500	1500
300 - 350	825	2500 - 3000	1550
350 - 400	850	3000 - 3500	1600
400 - 450	875	3500 - 4000	1650
450 - 500	900	4000 - 4500	1700
500 - 600	950	4500 - 5000	1750
600 - 700	1000	5000 - 6000	1850
700 - 800	1050	6000 - 7000	1850
800 - 900	1100	7000 - 8000	1900
900 - 1000	1150	8000 - 9000	1950
1000 - 1100	1200	9000 - 10000	2000

USACi does not require a competitor to upgrade their battery. In order for the competitor to receive maximum points in the "Upgraded Battery" section, any upgrade will be considered sufficient. The above chart shows the suggested total battery current for most total RMS wattage ranges of normal audio systems. A battery system's total current is equal to the sum of each battery's maximum amperage rating, or cold cranking amps (CCA), including all batteries connected in the battery system. The calculations assume an average stock battery rating of 650 CCA.

### APPENDIX C. - Upgraded Charging System

Total RMS Wattage of System	Charging Current Upgrade	Total RMS Wattage of System	Charging Current Upgrade
0 - 100	10	3000 - 3500	150
100 - 200	20	3500 - 4000	160
200 - 300	30	4000 - 4500	170
300 - 400	40	4500 - 5000	180
400-500	50	5000 - 5500	190
500-600	60	5500 - 6000	200
600 - 700	70	6000 - 6500	210
700 - 800	80	6500 - 7000	220
800 - 900	90	7000 - 7500	230
900 - 1000	100	7500 - 8000	240
1000 - 1500	110	8000 - 8500	250
1500 - 2000	120	8500 - 9000	260
2000 - 2500	130	9000 - 9500	270
2500 - 3000	140	9500 - 10000	280

USACi does not require a competitor to upgrade their charging system. In order for the competitor to receive maximum points in the “Upgraded Charging System” section, any upgrade will be considered sufficient. The previous chart shows the suggested amount of alternator, or charging system, upgrade over the stock charging system necessary for most total RMS wattage ranges of normal audio systems. Total charging system current is equal to the sum of all alternator current ratings. Other charging devices, which are part of the charging system, should also be included in the sum.

A vehicle’s total charging system current should be equal to the vehicle’s stock alternator current rating (in amperes) plus the minimum amount of upgrade current required for the audio system.

## **APPENDIX D. - USACI Event Guidelines**

This section will outline the event and judging procedures at a typical USACI sanctioned event. This is not an all inclusive guide as to how every show will progress but will give you an idea of what is expected of you and when. This section is targeted at the first time USACI competitor so that you will be prepared to progress smoothly through the judging line. This guide also assumes that you have read the rulebook and are now familiar with the basic USACI guidelines and rules. If you have any questions or issues before, during or after the event, do not hesitate to ask. Please refer to the following chart outlining to whom you should direct your question or issue. The order that is listed below should be the order you will follow at a typical USACI event to get an answer or issue dealt with in the most efficient manner:

**Event Director/ Event Registrar:** Typically the person at the registration table is a USACI event director and will be able to answer any question about the event. All questions regarding prices, event registration and lane assignment will be directed to this person. Also, rule and other event related questions can be addressed.

**Any Line Judge:** The line judge is typically responsible for a specific station at the event. Any questions about that specific station can be directed at the line judge. If the issue is out of the realm of responsibility of that judge, you may be directed to another person. Usually you will be directed to the head judge or registration table.

Head Judge: The head judge is responsible for the smooth progression of the show. In addition, this person is also responsible for any disputes, rule clarifications and so on. This person has been entrusted with the responsibility of making the show run smoothly. Additionally, this judge is usually very busy but will try to help as best he or she can. You may be referred to another person who can better deal with your issue at that time.

Senior USACI Official: Occasionally, a senior USACI official (President, Executive Director, board member) will be present at an event. This person will typically be able to answer any question you may have at that time. You may bring up an issue that this person has to research or refer to the Rules and Ethics board. If this is the case, you will be given a reply in an expedient manner.

The following is a general outline of the stations judged and what will be expected at each station at a typical USACI event. Some stations may be omitted depending on the event or your division.

### **Before Entering the Lane**

Make sure that your score sheet is completely filled out. All of the boxes MUST be filled in for your score to count. Simply putting "on file" will NOT be accepted. Failure to complete the entire top portion of the score sheet will result in your score sheet being discarded at the USACI office. Also, make sure you are set up and ready to go with your "Sound Quality" settings in your system. This will ensure that you are "ready to go" when the judging starts.

### **Station 1 - Verification and Alarm**

The verification judge will verify the overall safety of the vehicle and the installed audio system. Additionally this judge will verify the score sheet is filled out properly and completely. At this point, if any inconsistency is found you will be notified of any changes being made. After completion of this station, the judge will fold the score sheet and place it under the windshield wiper or on the dash. FROM THIS POINT FORWARD, YOU WILL NOT BE ALLOWED TO LOOK AT ANY PORTION OF THE Score sheet. Failure to follow this directive can result in the head judge deducting points from your score sheet.

### **Station 2 - Installation**

You will be required to demonstrate and detail all portions of your audio installation at this station. You will be given 5 minutes to demonstrate to the judge(s) how and why your vehicle meets or exceeds the basic installation guidelines outlined in this rule book. After the 5 minute period has expired, you will be asked to step away and allow the judges to score your vehicle. After the judges have completed scoring the vehicle, you may be given a brief outline of what the judges have found and how to improve your vehicle in the future (time permitting). It is advisable to write this information down.

### **Station 3 - Sound Quality**

This is the only station in which you will typically have very little interaction with the judge. The judge will approach you and ask if you are ready for sound quality judging. (You should already be ready) The sound quality judge may then ask you to load the official judging software and give a brief demonstration of how the tracking and volume controls are operated. At this point you will be required to step away from the vehicle and let the judge(s) score the vehicle. After the judge has completed scoring the vehicle, he or she will exit the vehicle and may discuss what was found and how to improve in the future. (time permitting) It is advisable to write this information down.

#### **Station 4 - Sound Pressure Level (SPL)**

At this station, you will be required to play the provided USACI software for 30 seconds at or near full volume attempting to achieve the highest sound pressure reading. In laymen's terms, you will be testing to see how loud the vehicle will actually play. Most competitors will only play their subwoofers during this test. There are many reasons for this but the most obvious reason is, the more cone area you have moving air in the vehicle, the higher the SPL reading can be. Usually, there is a big crowd around this station due to the excitement and noise. This will be your chance to show off how loud your system is for the crowd. After you have completed this test, you will be shown your highest Sound Pressure reading and will then be required to exit the judging lane.

#### **Station 5 - Display**

This is the final station at a typical USACI event. Here, you will be required to open your vehicle and "show off" the installation and vehicle. You should NOT demonstrate how loud the vehicle would get at this station. You should also be close by your vehicle to answer any questions that are asked of you as well as possibly demonstrate the finer points of your installation. It is your best interest, as well as the sport's, to answer these questions in a friendly manner as honestly and completely as possible. You need to be aware that in some cases, these people asking questions may be judges and you are being evaluated on how friendly you are and how well you display your vehicle. This station allows you to show everyone your hard work and also promotes the sport to spectators and future competitors.

#### **Before and After Judging**

The USACI staff requests that you not be disruptive during the event before or after you have been judged. Disruptive can be considered, but is not limited to, playing your system near the judging lanes while judging is still in progress. The head judge or event director reserves the right to deduct points or ask you to leave the event if continued disruptions are experienced. If you are asked to leave, you will not receive a refund and any points or awards you earned at that event will be forfeited.

***This portion of the rule book is intended to be a supplement to the Advanced Sound Quality Rule Book.***

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## **I. USACI INTERMEDIATE GENERAL RULES**

### **Intermediate Pro:**

A USACI competitor must compete in the Intermediate Pro division if he or she meets one or more of the following conditions:

- He or she works for a car audio dealer or distributor, or
- receives compensation for using a specific manufacturer's equipment, or

- a competitor's immediate family member meets one or both of the previous conditions or
- He or she has been reclassified to "Pro" by USACI or
- a competitor who does not meet any of the previous conditions may compete as a Pro by choice.

*Once a competitor places first at two USACI world finals events, that competitor must move to the advanced division.*

Any competitor who has previously competed in USACI advanced or expert division may not compete intermediate

### **Intermediate Consumer:**

If a competitor chooses to compete in the Intermediate Beginner division, the competitor must be free of all of the above conditions (including Intermediate Pro by choice) for a complete competition season. Logical exceptions for a competitor to compete in the Intermediate Beginner division while an immediate family member is in the car audio business will be considered by the USACI Board. Requests for such an exemption must be presented in writing by the competitor and answered in writing by the USACI Board. Such an exemption might be approved in this scenario: The competitor's brother has a store in Boise City, Idaho, yet the competitor can show proof of retail purchase of equipment near his or her own home in Atlanta, Georgia.

A USACI member may not change from Intermediate Beginner division to the Intermediate Pro or vice versa without prior approval from the USACI office. Additionally, a competitor may not compete in a USACI Advanced competition and then choose to compete in the USACI Intermediate Division at any time during the competition year. Once a competitor moves to the USACI Advanced division, he or she must remain in that division unless that competitor petitions the USACI Rules and Ethics board and receives permission to compete in USACI Intermediate. Such a request must be requested in writing and accompanied by a fifteen dollar processing fee. If the change is approved, it will be reflected by issuing the member new membership identification.

Any competitor who competes in USACI Intermediate will be required to compete in the equivalent or higher classification or division as they are competing in at other legitimate sanctioning bodies. A competitor will be required to immediately move to the USACI Advanced division as soon as ANY of the following criteria are met:

- finishes "first place" two times at the USACI World Finals
- reclassified by a head judge or USACI Rules and Ethics Board
- moves by choice

*Any competitor who has previously competed in USACI advanced or expert division may not compete intermediate*

*Note: USACI reserves the right not to recognize any car audio-sanctioning body.*

## **2. Divisions:**

Consumer - open

Pro - open

### 3. Event Judging Order

At USACI sanctioned events a USACI Intermediate Beginner and USACI Intermediate Pro competitor's vehicle shall be judged using four judging stations in the following order:

1. Verification
2. Installation
3. Sound Quality
4. Sound Pressure Level Testing (SPL)

For detailed descriptions of each judging station, please refer to the sections following General Rules. The head judge reserves the right to omit any judging stations before the event due to extenuating circumstances.

## II. VERIFICATION JUDGING CRITERIA (5 points max)

A USACI competitor's vehicle shall be inspected by the Verification judge to ensure that the vehicle and audio system meets the USACI Intermediate Requirements as outlined under USACI Intermediate General Rules. If, in the judge's opinion, the vehicle or system does not meet all of these Intermediate Requirements, the judge may bring it to the Head Judge's attention, and by the Head Judge's decision, the competitor may be disqualified from the event or moved to the USACI Advanced Division. The competitor's entry fee may be refunded if it is not a Regional or Final event.

The Verification Judge will verify the power ratings of each amplifier installed in the competitor's vehicle to ensure that the competitor has been entered in the appropriate power class. The competitor may be required to show proof of the manufacturer's rated RMS power. It is the competitor's responsibility to prove the manufacturer's rated power of the amplifier if requested. One example of proof may be providing the original amplifier documentation with power ratings included. Documents that are altered or not publicly available will not be accepted. If two documents are produced with different power ratings, the highest published stereo RMS rating at 4 Ohms and 12.6 volts will be used.

### A. Security System (5 points max)

A security system is considered to be essential to every competition vehicle. The Verification judge will evaluate the existence of Intermediate alarm components and their functional status. Each feature must be able to be demonstrated to receive a point. All remotes should be held by the Verification Judge while testing the alarm system to ensure entries are properly protected.

**Remote control** - The alarm system must be able to be armed and disarmed using a wireless remote while outside of the vehicle.

**All entry points must be protected** - Every normal entrance to the enclosed portion of the vehicle must be protected in such a way that the alarm will sound when that entrance is violated. This includes any door, hood, trunk or hatch lid, and etc. Secondary entry points (i.e. sunroofs and wing windows) may be protected by the use of additional sensors.

**Starter disable** - The alarm system must not allow the engine to be started if the vehicle's security is violated.

**Additional sensors** - The alarm system must have at least one additional sensor capable of protecting the vehicle other than the normal entrance sensors. Such sensors include glass breakage sensors, shock or impact sensors, motion detectors, microwave perimeter sensors, and etc.

**Dedicated battery backup** - The alarm system must have a battery, such as a small gel cell battery, which is dedicated to the alarm system **only** and is capable of powering the alarm system in the event that the vehicle's primary battery system fails.

### **III. INSTALLATION JUDGING CRITERIA (60 POINTS MAX)**

A USACI competitor's audio system installation will be judged according to the rules and guidelines in this section. Minimum points may be awarded in a category if the system completely fails to meet the judging criteria for that category. Partial credit may be given if the system is nearly consistent with the judging criteria for that category. Maximum points shall only be awarded if the system completely meets or exceeds the criteria for that category.

The mobile audio system installation will be judged for safety both to the driver and the vehicle. The system should be well designed for performance and durability and should exhibit a well-developed theme.

A competitor must provide photographs (or other media) of any installation application that is not readily visible if he or she wishes to be scored on that application. Otherwise the vehicle may be scored as if the application is nonexistent or inconsistent with the judging guidelines. Failure to detail all portions in the installation may result in minimum points awarded for a particular scored area in the installation.

It shall be the Installation Judge's responsibility to score the competitor's audio system according to the following rules and guidelines to the best of this judge's ability. It is the competitor's responsibility to accept that the scores awarded by the judge are given in the competitor's best interest as an honest evaluation.

### **B. POWER SOURCE DESIGN (15 POINTS MAX)**

**Battery(ies) Properly Vented (1 or 3)** - Every battery in the vehicle should be properly vented to outside air. The buildup of poisonous and explosive gases given off while a lead acid battery is charging can be very dangerous. This may be avoided if the battery is mounted in an open engine compartment or by a forced air ventilation system with the output completely capable of moving the gases to the outside of the vehicle. Totally enclosing batteries in a open engine compartment defeats the purpose for ventilation therefore not allowing maximum points to be awarded to the competitor. "Bat Cap" and other slow discharge type devices will be considered batteries and must be vented like a battery.

**Power Wires Properly Fused Near Battery (1 or 3)** - Each power wire, which is connected to the positive terminal of a battery, must be fused within 18 wire inches (including all connectors, wire and protection devices) of the battery and before the wire passes through any metal. This measurement will be taken from the center of the positive battery post and terminate at the output of the fuse or a manual reset circuit breaker. Being properly fused consists of using a manual reset circuit breaker or a fuse of the proper rating. Either should have a current rating less than that of the components, including connecting wire, to which it is supplying power, to include at the

positive post of multiple batteries connected together. Automatic reset circuit breakers are not acceptable. Also each fuse must maintain moderate accessibility. These rules normally apply to any circuit that supplies power to the audio system, but may also apply to a stock power lead which is deemed to be unsafe. Note: The gauge of wire being protected will decide proper fuse rating. System values will not be used to determine proper fusing values on batteries.

**Proper Gauge Power Wire(s) (1 or 3)** - The proper gauge power wire is essential in providing the audio system with it's required voltage and current during normal operation. A power wire that is too small to handle the current load placed upon it is a hazard to the competitor and his or her vehicle. Please use the wiring chart at the end of this book for reference in determining the proper gauge power wire.

**Power Wires Properly Terminated (1 - 3)** - Good wire termination techniques should be used, especially to connect the power source components. Each termination should be very solid and free of any fraying strands or corrosion. A termination should have some form of protection, such as heat shrink tubing, to protect it from corrosion. Also, each termination along the twelve-volt positive lead must have adequate protection to prevent accidental shorting to ground.

**Power Wires Run Neatly, Safely, and Securely (1 - 3)** - All wires which connect the power source components to one another and the audio system must be routed in an orderly fashion away from all potentially damaging parts of the vehicle. Any separately moving portion of the vehicle should be avoided as well as excessive heat sources (such as the engine's exhaust system) All wiring should be secured at regular intervals as necessary to prevent it from irregular movement. Other engine compartment wiring which is especially dangerous or unappealing may also be included in this category.

### **C. Head Unit and Other Processors (10 Points Max.)**

**Equipment Properly Mounted (1 - 4)** - The head unit and any additional processors, such as equalizers, crossovers, and enhancement devices, must be firmly mounted to the vehicle. The component's mounting should not allow irregular movement of the component in any plane of motion. If a component is mounted to a normally moving portion of the vehicle, then that particular portion of the vehicle will be inspected for irregular movement. Additionally, any head unit or processors mounted using a drywall type screw will be considered improperly mounted and will be awarded minimum points in this category.

**Components Properly Fused (1 - 3)** - Each component's voltage supply wiring must be properly fused to maintain the safety of the competitor and his or her vehicle. This will include all constant 12 volt, accessory 12 volt and illumination fusing (if originally supplied by the manufacturer) Failure to properly fuse each component or by defeating the factory supplied fuses will result in minimum points being awarded in this category.

**Wires Properly Terminated (1 - 3)** - Good wire termination techniques should be used. Each termination should be very solid and free of any fraying strands or corrosion. A termination should have some form of protection, such as heat shrink tubing, to protect it from corrosion. Also, each termination must have adequate protection to prevent accidental shorting to ground.

### **D. Speakers (10 Points max)**

**Speakers Properly Mounted (1 - 4)** - All speakers in the vehicle should be securely mounted so that no irregular movement is allowed. This will include the actual driver and/or panel that the driver is mounted to. Additionally, any speaker enclosure or mounting location that inhibits the use of any OEM safety device may be cause for a low score in this category. Any speaker

mounted with a drywall type screw will be considered improperly mounted and will be awarded minimum points in this category.

**Speakers Properly Protected (1 - 3)** - All speakers in the vehicle must be properly protected from damage during the normal use of the vehicle. Such protection may include, but is not limited to, an expanded mesh grill, waffle grills and so on. All speakers in the vehicle should be protected in some way to receive maximum points in this category.

**Wires Properly Terminated (1 - 3)** - Good wire termination techniques should be used. Each termination should be very solid and free of any fraying strands or corrosion. A termination should have some form of protection, such as heat shrink tubing, to protect it from corrosion. Also, each termination must have adequate protection to prevent accidental shorting to ground.

## **E. Amplifiers (10 Points max)**

Note: If an audio system does not use any external amplifiers, but instead uses only a signal source or processor with a built-in amplifier, then the signal source or processor shall be considered an amplifier and will be evaluated accordingly.

**Amplifier(s) Properly Mounted (1 - 4)** - All amplifiers in the vehicle must be firmly mounted to the vehicle. The amplifier's mounting should not allow irregular movement in any plane of motion (up, down or side to side). If an amplifier is mounted to a normally moving portion of the vehicle or installation (fold down seats, motorized amplifier racks, and etc.), then that particular portion shall be inspected for irregular movement. Additionally, any amplification device mounted using a "drywall" type screw will be considered improperly mounted and will receive minimum points in this category.

**Amplifier(s) Properly Fused (1 - 3)** - Each amplifier's voltage supply wiring must be properly fused to maintain the safety of the competitor and his or her vehicle. Failure to properly fuse each amplifier or by defeating the factory supplied fuses will result in minimum points being awarded in this category.

**Wires Properly Terminated (1 - 3)** - Good wire termination techniques should be used. Each termination should be very solid and free of any fraying strands or corrosion. A termination should have some form of protection, such as heat shrink tubing, to protect it from corrosion. Also, each termination must have adequate protection to prevent accidental shorting to ground.

## **F. Overall System (10 POINTS MAX)**

**Overall cleanliness of vehicle (1 - 3)** - A clean vehicle shows both respect for the judges and the competitor's pride in the vehicle. Only a very clean vehicle will receive maximum points. Some allowances may be made for lack of cleanliness if the event is held during bad weather or with less than appropriate judging area conditions.

**Overall wiring integrity (1 - 4)** - The competitor's vehicle should not allow for unintentionally exposed or unsightly wiring. All dash and speaker wiring should be hidden from view in the normal seated position. Wiring that is exposed by design in the amplifier or processor rack should maintain a neat and orderly appearance.

**Ease of system maintenance (1 - 3)** - A well-designed audio system should take into account the inevitable fact that each component will require repair or replacement, sooner or later. Each audio system component must be reasonably accessible for this reason. It should not require extended periods of time, in the judge's opinion, to simply remove a component or reinstall it.

## **G. Presentation (5 points max)**

The competitor will have 7 minutes to completely present the vehicle to the installation judge. The competitor will have 2 points deducted from the presentation score after 7 minutes has expired. 1 point will be deducted for each additional minute up to 10 minutes. When 10 minutes has expired, the competitor will be "cut off" and judging will begin. During this 7-minute period the judge(s) will not be scoring the system, but will be very attentive to the competitor. The competitor should explain all parts of the audio system while showing their existence and function, if necessary. Photographs (or other form of media) of components or installation techniques which are not readily apparent, an audio system layout, and other diagrams (etc.) may help the competitor to more effectively present the audio system. **Creativity points will NOT be awarded for these presentation techniques.** The competitor is being judged on how well he or she knows and understands the system. Additional materials pertaining to the audio system may be available to the judges after the presentation period has expired.

The average score in this category shall be three points. Points may be deducted if, in the judge's opinion, the competitor lacks a general knowledge or understanding of the audio system. While the competitor is allowed an assistant when making the presentation, the competitor **only** will be judged on knowledge and understanding of the system. If a competitor is unable to present the vehicle due to handicap or other extenuating circumstances, that competitor may appeal to the USACI Rules and Ethics board for a presentation exemption. If an exemption is awarded, the competitor who owns the vehicle **MUST** be with the vehicle while it is being judged. The competitor will be required to show the head judge and/or the event director the official exemption at every event.

## **IV. SOUND QUALITY JUDGING CRITERIA (125 points max)**

A USACI competitor's audio system's sound quality will be judged according to the rules and guidelines in this section. Few points shall be awarded in a category if the system fails to meet the judging criteria for that category. Partial credit may be given if the system is nearly consistent with the judging criteria for that category. Maximum points shall only be awarded if the system completely meets or exceeds the criteria for that category.

Sound Quality judging is designed to evaluate how well the audio system duplicates or recreates the original music performance. All musical information, including direct and reflected sound, must be recreated with accurate tonal balance. The musical information should also seem to come from the same direction and distance from the listener as in the original performance. When evaluating a very accurate audio system, the listener should be able to close his or her eyes and feel that they are actually experiencing a live performance.

A competitor will be allowed 3 minutes to adjust the audio system for Sound Quality judging. A Sound Quality judge will only adjust the system's volume and use such signal source playback functions such as fast forward and rewind or tracking. All other settings will be left untouched and should be preset.

Sound Quality software will be provided by USACI and should not be substituted during the event. It is the competitor's responsibility to ensure that the software is returned to the judging staff after Sound Quality judging is completed. If the software is not returned, the competitor will be considered disruptive to the event and appropriate action will be taken.

It shall be the Sound Quality judge's responsibility to score the competitor's audio system according to the following rules and guidelines to the best of this judge's ability. It is the competitor's responsibility to accept that the scores awarded by the judge are given in the competitor's best interest as an honest evaluation of the audio system.

The competitor must present the sound quality judge a seating position that closely approximates the normal seated position while operating the vehicle. The sound quality judge must judge the vehicle seated in the seat placement presented by the competitor. If the judge feels that this position will not allow him or her to accurately score the vehicle or is unrealistic, the head judge will determine if the seating position is unrealistic. The sound quality judge may NOT adjust the seat or seating position to personal tastes.

Covering any portion of the vehicle so that it blocks or restricts the OEM view out of the vehicle for any judge judging the car is prohibited.

## **H. Stage Position - Depth (10 points max)**

In this section, the judge will evaluate the direction of the sound stage relative to the listener. A properly designed audio system can make the lead vocals and other instruments appear in front of you such as on the hood of the car or further. The system should be able to remove the “physical boundaries” of the vehicle and make the listener feel that they are part of the original performance.

Proper ambiance is also critical in creating this “live” performance. Your mind uses the reflections off of the walls, ceiling and floor to properly place the performers on the stage as well as place the physical boundaries of the room. Reflections can be artificially added through the use of processors or the natural acoustics of the vehicle can be used. A properly designed system will sound natural and not overly processed. An example of overly processed would be to use the stadium setting on a DSP unit to play a track recorded in a small nightclub.

A good rule of thumb for recreating proper depth in a car audio system is to imagine yourself sitting in the forth row on the aisle at a performance in a small hall. This will give you a good idea of the correct depth and placement of the performers on the stage.

When evaluating a sound field that has good depth recreation, it should be apparent that some of the performers are also closer to the listener than other performers. If the audio system lacks depth, then the performers will appear as though they are standing shoulder to shoulder, with no one performer being farther away than any other performer. The judge should select one category which best describes the audio system and score the system appropriately.

## **I. Stage Position - Width (10 points max)**

In this section, the judge will evaluate the width of the sound stage relative to the listener. A properly designed audio system can make the performers located on the far left and right of the stage appear outside the physical boundaries of the vehicle. The stage should also contain all of the performers located in their proper place in between the far left and right performers. Generally, if the competitor can clearly define the left, center and right placement correctly, all of the performers on the stage will be in their correct positions.

A well-balanced sound stage should have distinct left, right, and center images that are evenly spaced apart. No image should be noticeably stronger or weaker than its adjacent image. While image separation is important, the sound stage should maintain seamless (smooth) transitions from one image to the next. The sound stage should have no apparent gaps or missing musical information. The judge should select one category which best describes the audio system and score the system appropriately.

## **J. Stage Position - Height (10 points max)**

In this section, the judge will evaluate how well the system reproduces the apparent height of the performers on the stage in relation to his or her seating position. If you continue to use the “forth row aisle” analogy, the performers should all be at or just above eye level to the listener. The audio system should recreate this placement in the vehicle. If the vehicle exhibits correct stage height, the performers should all sound like they are floating approximately an equal distance between the top and bottom of the windshield.

Maximum points will only be awarded if all portions of the stage remain stable and one or more portions of the stage do not appear to be higher or lower than the rest of the performers on the stage. If this is the case, an average of the best and worst stage height will be awarded. Example: Judging from the driver’s seat, the center and right placement appear to maintain the same relative vertical position but the left placement is considerably lower than the other portions of the stage. The center/right score (10) will be averaged with the left score (2) to arrive at the final score (6).

### **K. Definition and Clarity (40 points max)**

In this section, the judge will evaluate how well the audio system recreates the sounds of the individual instruments. The system should be able to recreate the instruments so they sound natural such as a guitar “sounds” like a guitar. A system that exhibits poor definition and clarity can make a clarinet sound like a trumpet or worse. Some examples of instruments and their general frequency ranges are detailed below.

**Highs** - Drummer’s high hat, cymbal, upper flute, etc.

**Midrange**- Upper vocals, piano, guitar, keyboard, trumpet, etc.

**Midbass** - Lower vocals, snare drum, bass guitar, trombone, etc.

**Subbass** - Bass drum, bass synthesizer, pipe organs, etc.

Instruments or vocalists from each frequency range should appear distinct and natural. There should be no additional resonance or harmonic overtones that may develop from the vehicle or audio system components. All musical and vocal tones should sound natural without an “overly processed” sound. Overly processed tones tend to lose warmth and realism. The best systems will reproduce tones that feel very “live”, but studio quality, almost one-on-one. These systems can also show the detail of certain musical passages and vocal personality that is sometimes processed out.

### **L. Sound Linearity (20 points max)**

A properly designed audio system should have an equal balance of all audible frequency ranges, both at low volume and at high volume. No one set of speakers should overpower any of the other speakers in this system. An example of a non-linear system would be when the subs overpower the rest of the speakers in the system. Also, all of the frequencies should blend naturally without any noticeable gaps. This means that the subs, mids and tweets should all work together to present the judge with the “total package” that represent all tones and frequencies being played.

The audio system should first be evaluated at low volume, approximately 70 dB, and then at high volume, approximately 100 dB using the same program material. At both levels, all frequency ranges should blend naturally, or with no range or speaker being noticeably louder or quieter than any other range or speaker. Also, speakers should not “break up” or exhibit any unnatural

sounds or characteristics during this portion of the judging. Only audio systems that exhibit natural and balanced reproduction of the entire audio spectrum will score highly in this test.

### **M. Engine Noise (15 points max)**

An audio system should be free of any noises that may be introduced by the vehicle's engine or ignition system. The vehicle's engine must be running and a current load must be placed on the charging system (i.e. headlights on and set to high beam, air conditioner operating, brake lights operated, etc). The audio system should be free of alternator whine and ignition pops or ticks, both at low volume and at full volume. The judge(s) will evaluate this category from the normal seated position. The judge may not lean forward from the normal seated position to evaluate an otherwise quiet system. Vehicles with an exceptionally loud engine or exhaust system will not be eligible for maximum points due to their distracting qualities. The judge should be careful to distinguish between actual alternator whine produced through the audio system and other similar noises that already exist while the engine is running. Such similar noises may produced by turbo chargers, the bearings in high output alternators, and etc. By listening with the entire audio system turned on at one point and with it turned off at one point, a proper evaluation of the noise source can be made.

If an audio system is determined to be free of all engine noise, then the vehicle's charging system will be inspected using a voltmeter. When the charging system is working properly, the entire battery system and connecting components should maintain a voltage higher than 13.5 volts, or at least the voltage should rise and fall substantially (.5 volt) while revving the engine. The voltage reading will be taken at the 12-volt DC input of the amplifiers or the closest point to the amplifiers. If the charging system is determined to be faulty, then no points shall be awarded in this category. If the Head Judge determines that the charging system was intentionally disabled, then the competitor shall be disqualified from the event with no refund. The judge should select the category which best describes the audio system and score the system accordingly.

### **N. Overall Sound Quality (20 points max)**

In this section the judge will evaluate how good the overall system sounds. A good analogy is "can I jam on this system for the drive home and not get tired of listening to it". Keep in mind that not everyone listens to the same kind of music (rap, country, rock and so on) so an audio system that will score highly will play all of these different types of music equally as well.

## **V. SOUND PRESSURE LEVEL - SPL**

If a competitor chooses to use an SPL "podium", he or she will be required to use the same brand equipment in the podium as is installed in the vehicle with the same output voltages. This will include all processors, head units and so on. Some examples would be:

Competitor A has 2 EQT's, a PLD1 Line driver and Pioneer M900 in the vehicle. This competitor uses a Pioneer M-900 and PLD1 Line driver in the Podium. This would be allowable.

Competitor B has an EPX2, PA1 and Alpine 7919 in the vehicle. This competitor has a Alpine 7909, PLD1 and an EQX in the podium. This would not be allowed.

*(All models and brand affiliations are used to clarify this rule)*

The SPL meter should be set to display only Max SPL and adjusted to the correct SPL range before initiating the testing. All gain or loss filters should be bypassed or set to their neutral position.

Windows, doors, and etc. can be either open or closed during this test. Doors may not be slammed or fanned during testing

The competitor will have a maximum of five minutes to make any adjustments to the audio system for this test. If the competitor is not ready for the test within the five-minute period, a minimum of ten points will be deducted. After the SPL meter has been placed and the competitor has loaded the software and readied the system, the competitor should signal the judge that he or she is ready for the test. The judge should then reset the SPL meter and ensure that all entrances are closed.

After the judge signals the competitor to begin the test, the competitor will play 30 (thirty) seconds of an official USACI SPL music track (no sine sweeps) in order to obtain a reading on the SPL meter. The music may not be restarted after judging begins. If the audio playback does not remain audible to the judge or if it is restarted (or repeated in any way) then ten points may be deducted from the competitor's SPL score. The competitor may choose to stop the SPL testing at any time before the 30-second time limit has expired but the SPL judge must be able to audibly verify that the correct disk is being used during testing. The use of tone generators, doublers or any other device that externally (outside of the closed signal chain) generates or alters the frequencies that the system is playing during SPL testing is expressly prohibited and will result in disqualification with no refund. Any competitor generating sound pressure with anything other than the provided musical software or externally influencing the SPL measuring equipment will be immediately disqualified and the incident forwarded to the USACI Rules and Ethics committee for review. Competitors found to be intentionally attempting to violate the above rules may be banned from competition for a period not less than 1 year and not more than 100 years. The decision of the Rule & Ethics committee will be final.

If the competitor feels that he or she had a system malfunction during the SPL testing, he or she may elect to retest. If the competitor elects to retest, he or she will be given 2 minutes to correct any problem(s) and retest. The result of the second retest will be the competitor's final score. The competitor cannot elect to take the "better of the two" for any reason.

While personal safety is ultimately the competitor's responsibility, hearing protection is required to be used by the competitor if he or she is inside of the vehicle during SPL testing. The competitor will be required to furnish their own hearing protection.

There is a 120 decibel maximum score (cap) for this test. The competitor's score will be based on the SPL meter's reading after the test track has been played. The competitor will receive his actual 30 second SPL score -100.

Note: Any ruling by the head judge is reversible only by a ruling of the rules and ethics board and only having been submitted by the petitioner in writing.

#### Vehicle Qualification

Please refer to the "Modified SPL" rules for specific microphone placement and vehicle interior modifications permitted.

## **VI. Showmanship and Bonus Points (20 Points Max.)**

The competitor is encouraged to display his or her vehicle for the spectators at all sanctioned USACI events. If the competitor chooses to display the vehicle, he or she will be required to have

the vehicle on display for a period that will generally start at 1:00pm and conclude at 4:00pm to receive points in this category. The vehicle must be on display during this period unless it is in the judging lane. The head judge or event sponsor reserves the right to modify or omit this category due to inclement weather, space constraints or other reasons. Only the head judge, or another person designated by the head judge, will be judging this category. Please keep in mind that there may be space constraints that will not allow elaborate display areas to be set up. You will be informed by the head judge at the competitor's meeting of the approximate amount of space allotted for each vehicle and display. If the competitor chooses not to display the vehicle, a score of zero will be awarded in this section. At any show other than a Regional or the World Finals, scoring in this category will 0 or 10. The location and length of time required satisfying this category would be determined by the event director and covered at the competitor's meeting.

**Display (0 or 10)** - A competitor will earn ten points in this section by simply opening the vehicle up for the spectators to look at. Typically, presenting the vehicle with all locations that have audio or other, upgrades will be required. This will include, but is not limited to, the hood, passenger compartment, trunk and/or bed. Points will not be awarded, if in the judge's opinion, the vehicle is not easily viewable by the spectators. The competitor will typically be required to have the vehicle open after they exit the last judging station for on half-hour or so. This will be covered in the competitors meeting before the show.

**USACI Decal Bonus (0 or 5)** - A competitor will be awarded 5 bonus points for prominently displaying an official USACI sticker on his or her vehicle.

**USACI Membership Bonus (0 or 5)** - A competitor will be awarded 5 bonus points for being a current USACI member. Each membership is good for 1 year from the time you join.

**APPENDIX A. - See USACI Advanced SQ Appendix.**

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## **SQ Intro**

SQ intro is a very basic sound quality competition that is designed to help the first time competitor learn about competition and prepare him/her for higher levels of competition at future events. This division will include a basic sound judging format, a "safety only" installation section, and an SPL run to familiarize the competitor with SPL judging. This SPL score will not be a part of the finals score but may be used to determine a tie.

Qualifications: this class is for new competitors only. The head judge at his/her discretion may disqualify any competitor whose audio system is too advanced for this division.

### **Divisions:**

Consumer - open

Pro - open

Consumer and Pro are defined in the "Advanced SQ" section of this book

### **Sound Quality**

#### **Staging:**

### **Front Stage = 10 points**

If the majority of the music sounds as if it is in front of the listener then full points will be awarded.

### **Center Stage = 7 points**

If the music sounds like it is all around the listener or slightly in front of or to the rear of the listener then 7 points will be awarded.

### **Rear stage = 4 points.**

If the majority of the sound appears to be behind the listener then a score of 4 points will be awarded.

### **Width:**

#### **Wider than car = 10 points**

If the music seems to be wider than the "a" pillars on both sides of the vehicle then 10 points will be awarded.

#### **AS wide as car = 7 points**

If the music is as wide as the car (A pillar to a pillar) then 7 points will be awarded.

#### **Not as wide as car = 4 points.**

If the music is not as wide as the "A" pillars or is wider on one side and not the other then the system will be awarded 4 points.

## **Installation**

### **Batteries safely mounted - 1 or 5 points**

The battery should be mounted in such a way as to keep it from falling out of the car if the car **should be overturned in an accident.:**

### **Power system fuse - 1 or 5 points**

The main system power wire should be fused to prevent a possible system fire

### **Head unit mounted - 1 or 5 points**

The head unit should be mounted so as not to be removed from the dash without tools.

### **EQ's, crossovers, processors - 1 or 5**

The processors should be mounted so as not to be removed from the dash without tools.

**Speakers - 1 or 5**

Speakers should be mounted to the vehicle so as not to be removed without tools.

**Amplifiers - 1 or 5**

The amplifiers should be mounted so as not to be removed without tools.

**Overall system appearance - 1 to 5**

The system is installed neatly. Wires are hidden from view, system looks nice.

Rules for SPL, voltage, etc. will be taken from the USACI Outlaw SPL "Basic Stock" rules.

**Welcome to Sound Quality!!**