

KINGDOM FESTIVAL –GOD BLESS NATIONS SUMMIT

KINGDOM FESTIVAL TECHNICAL SOUND & VIDEOGRAPHY DEPART



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An efficient sound forms the basis of communication which is one of the most important ingredients in an event this includes in the smaller publicity events, evangelist meetings and community special missions respectively. When we gather people and we cannot communicate to them effectively then every other objective of our events, projects and programs is rendered null and void so the team in this department should take their responsibility to deliver excellent sound quality and care of sound equipment's investment in focus of 70 mega sounds reaching over 70,000 to 200,000 people and over 1000 sound systems reaching 2000 to 4000 for workshops along with 70 Caravan Trucks fitted with sounds & screens targeted to serve all counties. This includes stewardship of musical equipment's, accessories, platforms, lighting both ordinary and special effects, LED Screens, generators, power systems and gadgets all working to give the best sound / musical experience in all our events. Adhering to sound stewardship policy will give our inventory longevity in the service along with efficiency that we shall always have it ready for meetings when needed not being grounded for repairs apart from regular maintenance.

The good stewardship and excellent us of our Public Address System (PA system) which gives us sound amplification and distribution system consists of microphones in all types and ranges, amplifiers, mixers, condensers, stabilizers, equalizer, limiters, power boards, cables, power surge protections, musical equipment's, and loudspeakers, speaker stands of various types and sizes, platforms, CD players, LED screens etc. Allow us to address a large audience in our mobile trucks or events. The process begins with a sound source (such as a human voice), which creates waves of sound (acoustical energy). These waves are detected by a microphone, which converts them to electrical energy. This signal is amplified in an amplifier up to a required level. The loudspeaker converts the electrical signal back into sound waves, which are heard by delegates without obstruction, itches, distortions, and vibrations and comfortable. The outlook of the sound must always be excellent in cleanliness, outer skins whether leather or skins, in good covers, neat orderly, and well-arranged and packed to reflect order to send a message of positive brand of our Festival and organization. Covering the sound systems from rain, heat and dust give sound good presentation along with preservation for longevity.

The following stewardships guidelines by this department will help us get best results and sound experience in our Festivals and summits including

Predictive Maintenance- This refers to using a diagnostic tool to anticipate possible failures and avoid some possible issues. And one common way is monitoring our sound system and checking whether it works properly.

Preventive Maintenance- This type is common and it is carried out to prevent possible failures, improve the function of a system and prolong the life of various computer components. Preventive maintenance is useful since it can detect weak points in the system, decrease the system downtime and reduce the number of repairs.

Preventive software maintenance usually includes scanning and cleaning through antivirus, the creation of backups freeing-up of your disk space and RAM. The preventive hardware maintenance should refer to the periodic cleaning of equipment and its components.

Corrective Maintenance- If the previous two types don't work and a problem occurred, you should perform this maintenance. In addition to solving the failure problems, you should find the cause and prevent it from happening again.

Evolutionary maintenance- The last type is to develop the system of your computer so it can perform more efficiently. This type concerns both hardware and software, so you can update with new technology and change various parts of the sound for better performance.

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- 1) Manage the sound drives per capacity any overdrive will break a system so you must select the best sound for different audiences. It is advisable to not exceed $\frac{3}{4}$ sound drive on output level of the speaker at different power levels. This can be achieved by setting of the sound and stabilization with skills in equalizing where the sound can still be soft and audible at the same time. It is the intensity of the sound stimulus as perceived by the human ear and chiefly a function of sound pressure. However, it is also dependent upon the frequency and the complexity of the waveform. The extra high-frequency content makes the sound seem louder. Our ears do not hear all frequencies equally.
- 2) Effectively, ears will turn down the volume and mute the damaging highest frequencies if the concert is too loud. However, any sound system can damage hearing if you get your ears close enough and drive it hard enough for long enough.
- 3) Masking-refers to one sound being obscured by another so it is indistinguishable from the first sound. It is one of the main obstacles to speech intelligibility. Typical sound systems include a number of potential sources of masking effects. Background noise is the most obvious. Sound system's normal operating level.
- 4) Reverberation- Reverberation is another common source of masking-related intelligibility loss. Significant reverberation occurs in a large room (i.e., church, gymnasium, or auditorium) where repeated reflections merge into a seemingly continuous sound with a gradual rate of decay. Many installed sound systems are used in spaces where there is little or no significant reverberation.
- 5) Equalization- It is the process by which the amplitude of discrete frequency ranges is adjusted. In distributed systems, EQ is most often used to compensate for speaker and room characteristics but can also be used for aesthetic enhancement. Many applications do not require equalization. The benefits of using equalization include improved speech intelligibility, enhanced sound quality due to a better spectral balance, and increased gain without feedback & echoes.
- 6) Impedance- When an electric current runs through a coil, resistance occurs that prevents the flow of the electric current. The value of resistance when an alternating electric current runs is called impedance; System impedance-matching is made much easier. It is simply a matter of adding up speaker power taps and selecting an amplifier rated for at least that much power. Line loss is greatly reduced, especially over long cable runs, resulting in better performance and reduced cost compared to long low impedance lines. The amplifier output is electrically isolated from the speaker line by the output transformer, protecting the output stage against a grounded line and thus eliminating a potential source of system failure.
- 7) High Impedance Matching Impedance matching is necessary to get optimum volume, avoid wasting power, avoid excess stress & prevent damage to amplifier & speakers, reduce distortion and noise & avoid uneven sound distribution.
- 8) Balanced Line- A balanced line is simply one that has three conductors wired separately. Two of these are signal wires which are wired out of phase with each other.
- 9) Feedback- Feedback is the loud squeal that is often heard in a P.A. system when a microphone is pointed too close to a speaker cabinet or the volume gets too loud this should be avoided. A squeal lasting less than a second is generally harmless. However, keep feeding back for very long duration tweeters and/or horns will get so hot that their coils burn and they stop working.

- 10) Dropping- Most P.A. speakers can take a degree of rough handling. However, if a cabinet takes a hard enough impact, it is possible that internal parts of the speaker can shift. Speakers have heavy magnets hanging off the back of them and momentum on a hard enough drop will cause the magnet to shift. Remember, the way a speaker creates sound is by vibrating hundreds and even thousands of times per second – it doesn't take much of a shift to throw the alignment of the various parts of a speaker out enough that they will rub. When a moving part on a speaker rubs, the part receiving the friction eventually rubs through and causes the speaker to fail. Usually it is the wire in the coil that is rubbing and it eventually rubs so thin that it breaks or shorts, thereby causing the speaker to stop moving.
- 11) Avoid Bad Cables- can cause is oscillations can occur in a P.A. system when the ground has come off in a cable. Everything may seem to be working alright but a missing ground can cause a high frequency (high pitched) sound that is so high that you cannot hear it, but it is, nonetheless, causing the tweeter to burn out. A high quality cable is much less likely to have a bad ground connection than a lower quality one and one blown tweeter can pay for a significant number of good cables.
- 12) Good Microphones choice and care determines the quality of sound- Various brands and types of microphones will give you various sound experiences.
- (a) Moving Coil Microphone -These are commonly used and have robust construction. Normally low impedance microphones are used as these permit the use of long microphone lines. These should have uni-directional characteristics which help in reducing acoustic feedback/howling specially in indoor sound system.
- (b) Condenser Microphone -Due to smaller size condenser microphones are commonly used for lavalier application either as Tie Pin Type or as Neck Type. Connecting microphones
- (a) Use of more than one microphone may be essential in large stages. In such cases, output from several microphones should be mixed in a mixing system and the common output fed to the amplifier, where the amplifier itself is capable of mixing individual microphone inputs, separate mixing system is not required.
- (b) The microphone plugs and sockets should be of multi-contact (three or more) type and freely interchangeable.
- (a) Sound distribution system, especially in a closed hall, has the risk of acoustic feed- back from the loudspeaker to the microphone causing singing. Siting of microphones and loudspeakers should be such that there is good pick-up of speaker's voice without abnormal rise in bass and good distribution with uniform coverage without acoustic feedback. The microphone should be sited normally in an acoustic shadow.
- (b) It is also desirable to create the illusion that sound is being heard directly. There should not be cases of sound from the loudspeaker, or reflected sound from the walls, reaching the audience after the sound from the speaker has reached directly.
- (c) Microphone should be, as far as possible, behind the loudspeaker in order to minimize the acoustic feedback. The correct distance between microphone and source should be predetermined and arranged to be constant as far as possible. It is important to see that if the level of reverberant sound or the surrounding noise near the microphone is high, the distance between microphone and source shall be reduced. The sound source should be directly towards the microphone, as otherwise the high notes, which are highly directional, would not be satisfactorily picked up by the microphone and thereby the clarity of the speech sound reproduced by the system will be poor.
- (d) Wind Shields- Microphones, when used outdoors, may have to be fitted with some means of protection against wind. However, it is desirable that performance of microphones should not be adversely affected by such wind shield.
- e) Crystal Microphone- Crystals which demonstrate the piezoelectric effect produce voltages when they are deformed. The crystal microphone uses a thin strip of piezoelectric material attached to a diaphragm. The two sides of the crystal acquire opposite charges when the crystal is deflected by the diaphragm. The charges are proportional to the amount of deformation and disappear when the stress on the crystal disappears.

Taking Care Of Your Sound Equipment

- 13) The care and feeding of our sound system represents a sizable investment, and its lifetime depends to a great degree on how well you take care of it a new sound serving over 15 yrs. Sound equipment is most vulnerable not while you are using it, but while you are not using it! Besides the normal wear and tear that you expect to have, to the needle, motor, cords, etc., the biggest enemies your sound system has are dampness, neglect, and helpers or untrained worship team forgetting to latch a case, or drop your microphone, or leave your power cord plugged into the wall, etc. And when a disaster happens, what can you say, to somebody who was only trying to help. Everyone touching sound must be trained and should only help on other non-technical matters like carrying speakers in a given mode.
- 14) Sound equipment when not in use should always be kept in a dry place. Damp surroundings and consistently high humidity cause electric contact surfaces to get a film of corrosion, and the more moisture in the air, the faster this film builds up, to the point where it causes poor contact. If you store your equipment for any length of time, be sure it is in a dry place, and before you store it, put a film of protective material such as WD-40 on all of the plugs and sockets, if you want it to work the next time you use it. Anything that slows down oxidization will make your equipment last longer.
- 15) Conditions of extreme heat don't do sound equipment any good, but if it is kept dry, no serious damage should result. If you must keep your sound equipment in a very cold place, like your car trunk in sub-zero weather, try to allow time for it to warm to room temperature before you have to use it. If you bring your sound system from a very cold place into a warm room, a film of water will instantly form on every exposed surface. This can cause many unpredictable problems, both electrical and mechanical, within your sound system. Motors can run slow, belts can slip, it can make your microphone sound funny for a while; but as soon as everything is warm and dry it should operate normally.
- 16) We should have many spare parts readily available in the venue of meeting not in the stores, A spare microphone cord is not a bad idea--a good microphone can be expected to outlast several cords, because the cord takes a lot of punishment. If you keep a set of spare plugs and sockets for your speaker cords, be sure to keep a film of oil on them, or they will oxidize just as fast as the ones that are in use, or faster! A spare speaker cord, power cord, and any patch cords you regularly use are a good idea have with you. This is good insurance in case of one going bad or being left behind at your last dance -- it happens! If you are always driving the same car to your dances, then keep these spares in a separate bag or box in the trunk of your car.
- 17) Periodic inspection and preventive maintenance, to make our sound system last longer and head off potential problems such as **needle care** should with proper care last for many, many hours of normal use. Be careful not to drop it on the record or on any metal surface, or drag it across a record. Use a brush or pad designed specifically for cleaning needles -- do not use your finger! Always be sure the tone arm is locked firmly in place before you place the lid on your turntable.
- 18) **Painted and finished surfaces:** Use a soft cloth or sponge dampened in a mild detergent solution for cleaning these surfaces. Some chemical cleaners will dissolve paint or plastic, so using any of these is not recommended. A vacuum cleaner with a dusting brush attachment does a good job removing loose dust and lint.
- 19) **Music sources:** If you use any of the following as your main music source -- Laptop, MP3 player, CD player, or MD player -- we have one important suggestion. Make sure you have something for a backup! It can be another one of the same type of component or something else. If you use a Laptop you might want a small MP3 player (and spare batteries) as your back up. Keep in mind -- no music, no dance! Periodically use your back up at a dance to make sure it is still in good working order -- nothing worse than a flat spare tire when you really need it.
- 20) **Turntable:** The turntable of most sound systems is driven by a wheel which has a rubber rim. If this rim and the underside of the platter are not clean and dry, slippage will result and the turntable speed will fluctuate. An oily film can accumulate on these surfaces; to remove this film, use a non-lubricating cleaner - denatured alcohol does a good job and is readily available. The bearing where the platter spins may be cleaned with the same cleaner, and a light film of oil applied so that the platter spins freely. Don't over-oil; if the oil gets on the platter or drive wheel it will cause trouble. Check the manufacturer's manual if you have one.

21) **Microphone:** Care of a microphone is fairly obvious. Don't drop it; don't blow into it; don't spray or squirt any material into it in an attempt to clean it. Keep it in a dry place when not in use. Excessive moisture inside a microphone can interfere with the free motion of the diaphragm, causing the voice to sound unnatural. A microphone stored in a very cold or damp place may show this symptom. A microphone with inadequate filtering may even develop this problem while in use, from the moisture in the user's breath. In either case, the problem will probably be gone when the microphone is once again dry. Excessive moisture can eventually cause corrosion and oxidization of components inside the microphone, causing it to fail. Most modern microphones have easily replaced internal foam filters. Check the foam filter periodically and clean it if it is good shape, replace it if it is starting to disintegrate.

22) If you use a wireless microphone, make sure you always have new batteries available. Keep this in mind -- almost half of the wireless microphones that we get in for repair only needed a new battery. Batteries can cause weird problems so if you have any problem -- replace the battery! Also make sure you have a wired microphone with you since you never know when you might have an interference problem or something else happen at a dance to your wireless system.

23) **Speakers:** Speakers, like other components of your sound system, should never be dropped or handled roughly, or stored in a damp place. The most frequent speaker problems come from cords and connectors. If a speaker has been dropped or handled roughly, it may develop a misalignment of the voice coil which can eventually lead to what is called a "dragging cone." To check for this, hook the speaker to your sound system. Turn the music volume off, and set the bass at maximum and the treble at minimum. Select a piece of music that has a good clean bass beat to it. Put your ear in front of the speaker and turn up only enough music volume so that you can hear the music clearly. If the cone is beginning to drag, you will hear a rasp on each bass note. The speaker may sound normal at your usual volume and tone settings, but over a period of time the problem may gradually become worse so that the speaker must be reckoned or replaced. Having checked the speaker, itself, reset the tone controls to normal and turn up considerable volume. Listen for any rattles or vibration from the grille or case, correcting these as necessary.

24) **Plugs, sockets, cords:** In normal use, your cords, plugs and sockets take more punishment than any other part of your sound system. For this reason, they should get a little extra attention--more frequent checkups, extra care in handling and stowing--to prevent failures and to prolong their life. Fortunately, there are advance warning signals before these components fail. If you know what to look for, you can avoid embarrassing interruptions of your dance program. Wear of plugs and sockets: If plugs slip in and out of their sockets much more easily than when they were new, they are getting worn and should be replaced before they begin to make poor contact.

25) Corrosion of plugs and sockets: Contact surfaces of plugs and sockets may become corroded from moisture in the air, particularly in very humid climates. This corrosion prevents good electrical contact. If your speaker plugs and the plugs on speaker cords become tighter rather than looser, it is the result of corrosion. One good way to slow down this process of corrosion, and even restore good electrical contact after oxidized film has begun to build up, is by cleaning plugs and sockets with WD-40, which is available at almost any hardware store. Put a little WD-40 on the plug of your cords and speakers; plug then in and out of their sockets a few times to work some of the material into the sockets, and wipe away any excess. This will help to prevent buildup of film which would cause intermittent contact.

26) Broken strands in cords: Cords can become frayed inside their insulation from repeated flexing and bending. To check your cords, set up your sound system, plug in your mic and play some music. Wiggle each plug in its socket and flex each cord along its entire length. Listen for static and interruptions, which are warning signals of future trouble. Keep spares of the important cords in a separate bag in the trunk of your car! I can guaranty that you will be thankful it is there someday.

Remember, any wire can be bent only so many times, and it will eventually break. You can make your cords last much longer if you form the habit when you put them away of coiling them without sharp bends. This particularly important in the case of shielded cables, including microphone cords.

27) **Avoid Excess Dust on Your Speakers-** Dust is not just aesthetically displeasing; it's also probably the most widespread problem for speakers. The dust not only adds an unpleasant noise to your speaker system but can also cause damage to the wiring inside.

The question is, how do you prevent dust from harming your speakers. Firstly, it's best to set up your speakers in a room or area that doesn't accumulate a lot of excess dust. It's tough to find a spot that doesn't accumulate any dust at all, so the next easy step is to store your speakers in a protective case and clean them regularly.

28) **. Clean Your Speakers Regularly** -Just as you would clean your car regularly, you need to clean your speakers frequently to keep them sounding clear, balanced, and crisp. As mentioned before, dust and dirt can be annoying, and they could shorten your speaker's lifespan. Here's what you need to know about cleaning your speakers. First, always check the manual beforehand for the correct cleaning steps and never use harsh cleaning chemicals, especially those containing alcohol or ammonia. When you clean your speakers, always be gentle. Use a soft dust pad, vacuum cleaner, or a dry, clean cloth. Avoid using liquid cleaners as they can damage your speakers, and remember to take your time while cleaning to avoid any harmful accidents.

29) **. Provide Sufficient Ventilation** - Your speaker system needs to stay cool while in use, or else overheating can occur. Always make sure there's a decent amount of airflow surrounding your speakers, especially if it's a scorching day. Enthusiasts passionate about high-end sound quality will suggest having fans blowing on your speakers while they're playing to ensure they stay cool. The right amount of ventilation not only ensures your speakers will last a lifetime but also enhance the overall sound quality. If you store your speaker in a tight space, the vibrations it produces will warp the sound, and this could damage your speakers.

30) **Steer Clear of Direct Sunlight** - No matter what, always keep your speaker system far away from windows and direct sunlight. By exposing your speakers to the heat of the sun, they can overheat and be seriously damaged. Overheating is easy for speakers because their design is so compact. This will result in the voice coils becoming impaired. Don't know what voice coils are? They're vital in supporting the electrical current between the speakers and their source. If you don't want to severely damage your speaker system, keep them away from the sun and any particularly hot areas in your home. If you're using them outside or on the patio, be sure to place them in a shady spot and avoid too much heat exposure.

31) **. Stay Away from Static Electricity** -Even though dust and heat are a speaker's main problems, another serious issue is static electricity. Static electricity is an occurrence when there's an increase of electric charge on the surface of objects. Usually caused by friction, it can result in sparks or crackling. This isn't good for our electrical devices, and a buildup of static electricity can burn out your speaker system. It's possible to innocently walk across your carpet, create friction, touch your speaker, and generate a burn-out. A burn-out can cause severe damage, but it's possible to avoid static electricity and the harm it brings. We shall buy anti-static floor mats or a humidifier. A humidifier can help prevent dry air in the room your speakers are stored in. Dry air is a conductor of static and can cause it to build up to a harmful level, and humidifiers effectively fight against it.

32) **Protect our Speakers From Power Surges-** A sudden power surge can be seriously damaging to your speaker system, as well as all of your other electrical devices. There are two main types of power surges—a typical blackout caused by household power and lightning storm strikes, which can directly impact your speaker system. Fortunately, protecting your speaker system from an unexpected power surge, like a lightning strike, is pretty simple to do. Consider purchasing a surge protector or a UPS (uninterruptible power supply). A surge protector will divert extra electricity to the ground wire if it goes over a specific voltage. On the other hand, a UPS will provide backup power when your standard power source cuts out.

33) **Preventative Maintenance for Audio Systems-** There is simply nothing worse than hosting a large function at our facility, only to discover that the sound system is not operational for a standing-room only crowd. While some contractors offer 24-hour support, the travel time involved may make it far too late for the tech to be of any useful assistance. Keep your sound system in top shape. Use a jet of compressed air to clean out air vents on sound equipment. Clean dust bunnies from around the audio/video system. Rotate volume and tone controls every 6 to 12 months to keep them lubricated. Leave equipment on 24/7 and Get an annual check-up of your equipment from a sound contractor.

34. Don't let your sound system become public art- From our experience, a typical commercial sound system will last no more than 15 years before problems start creeping in due to component aging. That is assuming that the sound system is properly designed, is well ventilated, and that name brand equipment is being used. Sound systems that are poorly ventilated, or located in a closed closet can see that longevity number drop to under half.
35. Failures due to Heat- While the days of a smoke-filled environment are long gone, the large metal heat sinks that keep an amplifier cool are also long gone. Today's amplifiers use small heat sinks, and rely on fans to keep cool. Even in a relatively clean office environment, an amplifier can gather a lot of dust. This heats up the internal components quickly, resulting in damage that can exceed the cost of a new unit.
36. A neglected amplifier at five years. All that dust and dirt leads to overheating and serious damage- While we do not recommend that anyone open their amplifiers to clean them, a jet of compressed air into the vent slots of the front of an amplifier can certainly clean off the serious accumulation of dust and dirt seen above. We recently completed a service call to an arena that advised that the sound cut out after the system had been used for about an hour. We discovered an even worse scenario than the above picture. We had installed the two amplifiers 17 years ago, but they had never even once been serviced. One amplifier was beyond repair due to the heat damage, but the second was cleaned and is still working today. It is very important to remove dust bunnies from around the amplifier rack. This prevents the fans from sucking in more dust, which then results in more build up inside the amplifier chassis.
37. Noisy controls/system cutting out- A non-technical fix to cure some common problems of intermittent sound systems is to rotate the volume controls and switches every 6 months from one end to the other. This prevents oxidation from building up, and ensures the lubrication within the controls remains fluid. It is usually that one signal input (such as a wireless mic) that is only used once a year for a large function that will inevitably fail on the day it's needed. Working the controls can prevent this experience. Note that we do not recommend removing any security covers that may be covering sensitive settings. In addition, do not forget to rotate the volume controls that may be in a penalty box or on a pool deck.
38. Most sound equipment draws a negligible amount of power when idling, so we recommend that mixers, amplifiers and signal processing equipment be left on 24/7 for a number of reasons:
- You won't see the difference on your power bill if you turn off even a large arena sound system nightly.
 - Just like an incandescent bulb will burn out when you turn it on, so will an amplifier. The surge of power rushing into the amplifier at turn-on is hard on equipment. Leave the equipment on so that it remains at a constant temperature, as this practice lengthens the life of electronic components.

The exception to leaving sound equipment on continually are CD or MP3 players, laptop computers that act as music sources, and (gasp!) cassette decks – IF anyone is still using them. All of these music sources use components such as lasers or motors that have a finite life to them. Turning these devices off until they are needed will extend their life significantly.

39) Call our sound contractor for a yearly check-up- While the above tips will extend the life of your sound system, there's nothing like calling in a professional technician to run through all of your audio and video systems completely. We were recently requested to check a sound system that we had installed 15 years ago. When our tech arrived on site, he noticed that there was a lot of hisses in the sound system which had not been mentioned when we were initially contacted. Our tech diagnosed that one of the components in the sound rack was defective and was able to bypass it, ensuring that the sound quality was excellent for the upcoming high school graduation ceremonies. This was a case where only a tech familiar with sound equipment could have resolved the issue, and averted a potential audio disaster!

40) It is a wise choice to have a qualified audio contractor check your entire sound system over at least once every year. Think of it as being the oil change that keeps your system running smoothly. A skilled tech can pinpoint and diagnose potential problems that may not be apparent to end users. End of Life The expected life span of a well-designed and installed sound system is about 15 years. The exception is your music sources, which typically last two to three years for a CD/MP3 player. This time frame is even less if used in a pool environment where chlorine can and will attack mechanisms, laser assemblies and microphone jacks that are typically abused in an arena or aquatic setting.

41) Start by figuring out what you can afford and then determine what sounds best to you within that price range. Always listen to the speakers before buying, as not all of them are made equal. When choosing a speaker, you'll want to consult the specification sheet, which should be readily available from most reputable manufacturers. The most important specs to know are the frequency response, SPL output, and dispersion. If you are using passive speakers, then you'll need to know the wattage and impedance (ohms resistance).

42) A full-range speaker with a frequency response of 60 Hz to 18 kHz may be fine for many genres of music, such as country, folk, or folk-rock, where the kick drum and bass don't need additional punch. For rock, metal, pop, hip hop, EDM, etc., you will want a subwoofer. A subwoofer extends the frequency response down to 45 Hz or lower and will allow the full-range speakers additional headroom and increased output.

43) Frequency Spectrum for Full Range Tops and Subwoofer -The sound pressure level of a speaker will determine how loud a speaker is at a given distance (typically 1 meter). Most spec sheets will show Peak and Continuous outputs. The peak is how loud the speaker is on loud transients, while continuous output is the average loudness. This is a good indication of how the speaker performs, dynamically. Sound pressure levels (SPL) will attenuate by 6 dB with the doubling of the distance. If a speaker were capable of 135 dB at 1m, then 2m would have an SPL of 129 dB. By doubling the distance to 4m, the speaker would output 123 dB and so on. Another consideration is that doubling up on the speakers will result in a +3 dB increase. If a speaker has a peak output of 135, by adding another speaker the output would increase to 138 dB.

44) Sound Pressure Level to Decibels Distance - Dispersion is the way the sound is projected horizontally and vertically from the speaker. This is incredibly useful for determining the placement of speakers, as you can direct the sound away from boundaries, such as walls and ceilings. For instance, a speaker with a 60-degree horizontal dispersion might work well for a narrow room, while adding an additional speaker could increase the dispersion to 120. The goal is to offer coverage to the entire audience, while directing the sound off the walls. Many speakers are designed to couple by utilizing a trapezoidal enclosure, versus a square or rectangular enclosure. The trapezoidal design allows for easy placement of the speakers, as they can be placed together in tight-knit group or array, which allows for coupling with reduced interference between speakers.

45) The vertical dispersion will determine how high the full-range tops will need to be to provide proper sound coverage for the audience. There are many ways to configure a system, in terms of height and whether ground-stacking, speaker stands, scaffolding, or trussing should be implemented as a way to get the speaker high enough to offer extended coverage. The higher the speaker, the farther the sound will travel. If it is too high, there will be a loss of impact in the front. Not high enough may result in the sound being uncomfortably loud for the front row.

46) it is suggested setting the tops at shoulder to head level, about 5 to 6 feet from the floor. If you are utilizing subwoofers, you might try ground-stacking the tops on top of the subs. Many speakers offer pole mounts for use with speaker stands. This is the simplest way to get proper height, especially if you don't have multiple subs to create a ground stack. At the very least, you want your high-frequency driver above the heads of the people in the audience.

47) Ground Stack -Active versus Passive there are pros and cons to both active and passive speaker designs. Active speakers are the easiest to deploy with built-in amplifiers that are matched to the speaker components (woofers, mid-range, and tweeters—typically compression drivers). They also feature crossovers, which isolate and route frequency ranges to each component, and built-in limiters for protecting the drivers. A three-way active speaker will have two or more built-in crossovers, which isolate the high, mid, and low frequencies. The advantage of active speakers is the ease of setup and operation. They only require a line level input and you won't have to use separate amplifiers to power them.

48) Passive speakers require amplification, speaker cables, and may require an outboard crossover and other signal processing. Some passive speakers will utilize an internal crossover network, which functions much like the active speakers. Other speakers are designed to be bi-amped or tri-amped, which can be a benefit, as this allows greater control over the speaker components, but also requires a separate amplifier for each component of the speaker. If you decide to go with a passive speaker design, you'll need to look at the specification sheet provided by the manufacturer to determine the correct amplifier(s).

49) The input range of a speaker is typically given in continuous, program, and peak wattage measurements. You will most likely see the continuous output and either program or peak. The general rule is a doubling of the continuous results in program, while doubling the program will give the peak performance. For instance, let's say we have a 4-ohm speaker that requires 600 watts of continuous output, a program output of 1,200 watts, and a peak output of 2,400 watts. Power draws as 1/8 power, 1/3 power, and full power. 1/8 power delivers the amplified signal below the built-in clip limiters, while 1/3 power will have the clip limiters occasionally flashing. Full power will have the limiters in constant activity. When engaging the clip limiters, you are actually rounding off the audio signal to prevent distortion, but the signal of the audio will be compromised. I prefer to run the amplifiers at 1/8 power, which will give plenty of headroom without squaring off the waveforms. You may also use a higher-rated amplifier at 1/8 power without fear of damaging your speakers. Remember, the quickest way to blow a speaker is to under power it.

49) Subwoofer -Depending on your setup and how many subs you have, you will have more consistent results by placing all the subs together. Placing two subs together will yield a 3 dB gain in SPL and they will couple without interference. A stereo sub configuration may create null points in the room where certain frequencies cancel each other out. Other tricks to maximize bass are to place the subs near a wall or corner, as each of the boundaries will reinforce the sound and help load the room. My favorite configuration is to center-cluster four subs together (2 wide x 2 tall).

50) Speaker Processors- Regardless of whether you are using active speakers or passive speakers with an amplifier, you should invest in a speaker processor. In my opinion, it is the most important piece of gear and will save you time, money, and headaches. A speaker processor combines a number of processors into a rackmount signal processor. You will find gain, EQ, delay, crossovers, and limiting for both input and output. A typical processor might have a stereo input and six outputs. The inputs will feature a 6- to 8-band parametric EQ and/or a graphic EQ, as well as a system delay. Each output on your processor will offer gain, a 4-band parametric EQ, a delay for time-aligning speaker components in a bi-amp or tri-amp application, or a full-range speaker and a subwoofer.

51) Signal Path for a Passive Sound System - You will also find digital crossovers featuring Bessel, Butterworth, and Linkwitz-Riley band-pass filters. Each crossover offers a high-frequency and low-frequency setting with selectable filter types. For tops, I typically set the HPF to 96 Hz on a 24 dB per octave Linkwitz-Riley filter and the LPF to off. For subs, I set the LPF to 96 Hz on a 24 dB per octave Link-Riley filter and the HPF to 30 Hz on a 48 dB Butterworth filter. The major focus is the crossover between the LPF of the sub and the HPF of the top. A 24-dB-per-octave Link-Riley filter keeps the frequency response flat where both the subwoofer and top are crossing over.

Note: A speaker processor delay is not a digital delay effect, as it is intended to literally delay a signal by a set amount and does not offer a "wet/dry" setting. If a manufacturer offers time delay settings for your speakers, you can use those to time align the tops and subs. The LS-801P has a 3 ms delay, so adjusting the tops to match the inherent delay of the subs will provide a coherent and phase-accurate wave front. If you don't have the specs, you can invest in a measurement system like SMAART. If you have an iPhone or iPad, you can purchase the Audio Tools app by Studio Six Digital, which can help you measure and calibrate your sound system.

52) Analog Mixers versus Digital Mixers- Analog mixers are the mainstay of any audio system, and range in price and features. There are some diehard analog enthusiasts who will not move to a digital mixing board, as they believe the analog components sound superior to digital. If you are mixing a live band, you will want some additional signal processors to shape the sound of each instrument. Most analog mixing consoles will offer a built-in four band parametric EQ, which helps balance the tonal sound and carves out space for each instrument in the mix. It is rare to find analog consoles with built-in dynamics available on every channel. Therefore, an all-analog setup will require several racks of gear to accommodate the additional signal processing, such as compression and gates for each channel.

53) Another aspect to consider is the use of wedge monitors or stage monitors. These are speakers that are typically on the floor and angled up toward the performers, offering a dedicated mix, which allows the musicians to hear themselves on stage. Feedback can become a problem, so the use of graphic EQs will be needed to remove the frequencies that are feeding back. Add in additional signal processors like multi-effects, delays, and reverbs and you can see the analog setup may sound better, but will cost more money with the additional signal processing, plus there are additional racks, cabling, troubleshooting, and maintenance involved.

54) Digital mixers have made some considerable advances in recent years regarding the quality of the sound, and pricing that is comparable to many moderately priced analog consoles. Digital mixers offer the best solution for any touring band, with a large channel count and each channel packing four-band EQ, compression, and gating. Additionally, each output features graphic EQ for ringing out monitors. Many mixers feature internal effects with up to eight insert slots for use with internal sends. You can still use your favorite outboard gear, but the digital platform reduces the amount of gear substantially. Another benefit of the digital mixer is the wireless control options. Many mixers offer iOS and Android control apps.

55) Stage Snakes and Stage Boxes- A stage box or multi-channel snake is highly beneficial for reducing clutter on the stage. Some larger stage setups use a splitter that splits the signal from all the sound sources on stage between FOH and monitors. Most mid-level bands typically don't have a dedicated monitor engineer, so the FOH engineer will perform both main mixing and monitor duties. With an analog setup, you'd be working with a 16- to 24-channel audio snake with a cable run of 100+ feet. A drum kit may have 8 to 12 microphones set up to capture the sound, so a dedicated sub-snake allows for shorter mic-cable runs and a much cleaner stage setup.

56) Stage Sub-Snakes - Utilizing stage sub-snakes before going to the main stage snake will keep the cable clutter on stage to a minimum. Many digital mixers offer digital stage boxes that function like an analog stage snake, only instead of a 16- to 24-pair multi-channel cable, the digital snake will use a single CAT5 cable to connect to the mixer in the FOH position. This cuts down considerably on the weight and setup time of the entire system.

57) Microphones- For musicians to be heard, microphones are used to capture vocals, guitar amplifiers, and drums. The mainstay of live music is the use of dynamic microphones. There are many microphone manufacturers, but the favorite of most clubs is still the Shure SM58 for vocals and SM57 for instruments. They have proven their value over time by sounding good and being incredibly rugged. They can literally take a beating and still function. If there is the budget and desire for wireless microphones, I highly recommend the Shure GLXD or QLXD series digital microphones. The GLXD is an affordable option with a clean, clear sound without any artifacts, a simple setup,

58) Crossover- This is the operation that directs bands of frequencies to specific speakers. They can be two, three or even four-way, indicating the number of "splits". With a two-way crossover, you can direct only the low-end of your music to the sub-woofer(s), and everything above that to your main loudspeakers; in the case of three and four-way crossovers, your lows go to your sub, your mids (low and high-mids in the case of four-way) to your loudspeakers, and your highs only to your tweeters (in or out of the loudspeaker cabinets, as long as you have a separate input for each speaker available). When you do this, you'll direct the full power of your amplifier to specific speakers thereby giving you better-performing speakers, cleaner sound, and more loudness (when done right, with all the proper gear). A sophisticated loudspeaker management system, complete with its own relatively large screen to allow easy adjustment of parameters.

59) Limiter/compressor- This is the operation that regulates how much power you can push to your speakers. This is used if the amplifiers are capable of pushing the speakers past the "clip" point (be driven to the point of distortion). This is also important if you have an upper-end volume (dB) limit for your space, due to environmental regulations, for instance. Limiters / compressors are the reason why it's just pointless to push your controller / mixer into the red, because doing so would more than likely engage the limiter / compressor in the LMS, so the music doesn't get any louder, just less clear as the limiter / compressor increasingly works to stop you overloading the speakers.

60) Equalization- This is the operation that decides how much of each frequency gets sent to the speakers. It's the same thing as your DJ EQs (low, mid, high) only with a lot more control over the range. This is also very important for balancing the "weight" of each range of sounds. Remember that when you set the EQs on your LMS, it's the maximum your system will output, not an average. Getting the EQ right is something the PA company that sets up an installation rig will ideally spend some time doing, and done properly, it should mean the DJ can play with his or her EQ "flat", not having to compensate (for too much or too little bass, for example) by always having an EQ in the mixer or controller set somewhere away from central.

61) Delay- This is the operation that times multi-speaker systems to get the sound to the same location at the same time. When you point two (or more) speakers at each other, you're almost guaranteed to get "phase cancellation", and that actually makes your music quieter. When you properly set a delay on the sound for each speaker, you'll get convergence, which results in a wider coverage area than your two-loudspeaker system, and sets your sub-woofer to be in time with the rest of your music.

62) Optional loudspeaker management system functions- A loudspeaker management system in situ, mounted in the club's amp room, in a rack alongside the amplifiers. Auto-feedback suppression this is the operation that actively cancels the "squeal" you get when your microphones are resonated by your speakers (bass and/or loudspeaker). When this is turned on, your LMS runs an active EQ process and quickly cancels anything that spikes on the EQ curve. You'd want to have this on whenever you have people recklessly operating a microphone anywhere near a loudspeaker, but it's typically not desired when you don't.

63) Temperature and humidity compensation- This is an operation that extends low-end frequencies. Humidity does introduce some changes to the sound (because it's changing the air density), and this is designed to correct that. However, when your room temperature / humidity goes up, that's typically a result of more dancing bodies, which requires its own tuning (one of the jobs of the audio engineer on the night).

64) Subharmonic synthesis- This is another operation that extends low-end frequencies, this time really deep ones. By extending the low-end in this way, it's possible to produce true tummy-churning sub-bass, but this comes at the cost of power for the rest of the low-end. You'll want to make sure your subwoofer can produce these sounds in the first place if you're going to engage this, because it won't do you any good to extend the bass if the cabinets cannot handle it.

65) Amplifiers- These are the physical boxes in your rack (or in your powered speakers) that sends amplified (increased wattage) sound to your speakers. They take signal and power in, and the amplifier increases the signal by the amount you've turned the knob. Without a limiter in-line, you're very likely to do damage to your speakers if the amplifier can output more than the speakers can handle (refer to your spec. sheets for these numbers).

66) In-speaker crossovers / limiters- This is a hardware feature in some speakers which either balances the frequency range automatically or limits how much output the speaker will emit before self-limiting. Internally crossovers and limiters are normally crude safety features, but they're better than nothing. If you use an LMS, it's best you disable these features because they will complicate the tuning process.

67) Setting up an LMS- In order to use digital delay in your LMS, you need an "RTA mic" (it's a specially designed microphone for this purpose), a mic stand, and enough XLR cable to reach the microphone in its testing location. Another thing to bear in mind is that most LMSs have profiles you can save and restore at another time, as well as auto-restore when the power is turned off and restored, so make sure you save your settings when you've got them right, or you'll lose all your hard work! Finally, do make sure to get an LMS that suits your needs, especially when it comes to number of speakers. For instance, if you have four loudspeakers and a sub-woofer, make sure you buy a unit that has one XLR output per speaker so you can include all your gear under the LMS's control.

68) In-Ear Monitors- Many bands prefer to forgo the use of stage monitors and opt for in-ear-monitors (IEM). I've used the entry-level PSM300 Shure Personal Monitoring System for years and have had excellent results. With a digital mixer, the setup and operation is even simpler, resulting in very happy musicians who are able to set their own monitor mix—and without excessive stage volume.

69) Make Sure Your PA System Can Adjust to Changes- First things first: make sure your PA system is equipped to handle the size of your event. Keep in mind that the operating volume of your PA system will likely change once your venue fills up with attendees. Therefore, we require more volume, so make sure your PA system is slightly bigger than what your venue requires to ensure that you'll have plenty of headroom in case you need it.

70) Know Where our Power Sources Are- We shall constantly have standby generators in all our sound systems in the caravan trucks and other events fitted with earthing

71) Keep Your Portable Generator Clean/Covered When **not in Use** -When our portable generator is sitting in a room for days on end, it can get pretty dirty. Build-ups of dust, debris, or even mold/moss can accumulate on your portable generator. These contaminants can seep into vital components, possibly making it harder to function. Therefore, you'll need to keep your portable generator cleaned and protected to help maintain it. The best way to protect your portable generator from getting dirty is by purchasing a generator cover at your local department store.

These covers can shield your portable generator and can come with additional capabilities such as water-resistance or weather proofing. However, they also act as insulation, so take them off before running your generator to avoid overheating.

72) . Empty our Portable Generator's Tank After Use- After our portable generator has done its job, you'll need to empty its tank into a gas container. Although we recommend you have enough fuel for your generator, you shouldn't have it stored idle in the fuel tank. This can lead to gum deposits, which is when gas sticks to metal surfaces and chambers of the portable generator. Gum deposits can obstruct its performance. Therefore, it's recommended to store your portable generator's fuel in a separate container after every use we must ensure our generators have sufficient fuels and extra in every event.

73. Purchase and Keep Backup Fuel and Filters- Speaking of fuel, you'll want to ensure you have enough on standby. Power outages may last anywhere from a few hours to several days, so it's important you have enough fuel to help accommodate. We recommend having enough backup fuel to fully refill your portable generator's fuel tank. Be sure to also have backup oil and oil filters in case they require a replacement.

74. Monitor our Portable Generator's Wattage Capacity- When using your generator, you'll want to be sure it can handle the voltage you plan on using. Not all portable generators are the same, so you'll need to check your portable generator's labeling or manual to determine its wattage rating. There's usually two of these ratings listed: starting and running. The starting or maximum rating is how much wattage a generator puts out in very short periods of time. Due to this, starting ratings usually have a higher rating. But overall this rating should be ignored for the most part. Instead, you'll want to focus on the running or continuous rating. This rating determines the wattage over extensive periods of time, which is what you'll be needing from a portable generator. Accommodate the running rating with whatever devices you plan on using with your portable generator.

75) Keep Track of All Your Gear and Where It's Plugged In- Setting up a sound system can be a complicated affair, so don't make the rookie mistake of losing track of your equipment. Make a written inventory of your gear so you know who's responsible for what equipment. Mark the gear itself, especially the cables, and color-code them at each end. You'll be able to tell at a glance which microphone corresponds to which channel of the mixer. Always make sure to keep your gear safe and secure during your event.

76) Testing our PA System - And Then Test It Again Schedule time to set up and test your PA system as early as you can before your event. Additionally, test the PA system an hour or two before your event even if it is under lock and key. You'll be surprised at how far your settings can wander, and how many cords will prove suddenly to be non-functional at an inopportune time.

77). Make Sure our Frequencies Are Available- If your event is being held in a crowded urban area such as New York City, double-check that your wireless microphone frequencies are still available during the day of your event. Never assume that your required frequencies will always be open.

78) . Don't Overload Your PA System- When operating your soundboard, start off at modest volumes and work your way from the bottom up. Overloading your sound system can lead to abrasive feedback and distortion, which will likely irritate everyone at your event and send a message that you are both unprofessional and a poor planner.

79) . Write Everything Down at the Mixing Board- Just as it's important to keep a written inventory, it's equally as important to document sound levels at the mixing board. If you have multiple presenters at your event, it's unlikely you'll remember the audio levels and requirements for each presentation, especially if they are multimedia presentations. A simple trick is to place a strip of light-colored tape next to each channel, and use color-coded marks to denote the levels that each presenter requires. Additionally, use a notebook to jot down any extra needs and requirements.

80) . For Multimedia Presentations, a Little Volume Goes a Long Way- Pay extra attention to our PA system's volume during multimedia presentations, including ones featuring music, sound effects and videos. Be sure you don't get carried away with the volume and drown out the presenter during their presentation. Before each presentation, ask your presenters if they have any unique requirements for their multimedia presentations, and you'll avoid mishaps.

81). Remind our Presenters to Mind Microphones- Some of your presenters may be seasoned speakers and will be aware of common microphone issues. However, some of your more novice presenters may not know the ins and outs of handling a microphone. Make sure all potential microphone concerns are addressed to each of your presenters. Tell your presenters not to wander too closely to the loudspeakers, especially if your stage has limited space. If you're using wireless, hands-free lavalier or headband microphones, place them on your presenters in a position where their body won't interfere with the sound's transmission or clarity.

82) You can reduce excess noise from clothes rubbing against the microphone by placing a loose knot in the mic cord just below the mic, or by taping the cord onto their clothing in an unobtrusive location, leaving plenty of slack between the microphone and the tape. Save our yourself an unexpected cleaning bill by using tape that won't leave a sticky residue. Beware of duct or electrical tape.

83) Make Sure Someone is Behind the Soundboard at All Times-Don't presume our audio technician can simply set up the mixing board and let it run by itself. Assign an assistant to take care of last-minute issues so that your technician will be free to pay attention to what's happening on stage and make adjustments on the fly **AVOID TEMPERING WITH THE SOUND AFTER SOUND CHECKS MANY TECHNICIANS**

84) Don't Block the Vents Like people, machines also need to breathe. So, don't block the vent, which aims to ensure your computer can remain cool enough to work properly in extreme heat you can provide external fans to keep machines cool in case you sense overheating.

85) . Keep Your Food and Drink Away from sound rooms- Don't eat and drink over machines since the consequence is serious. The mixers, amplifiers are destroyed after a single spill or food residues penetrate the case of your device and damage the internal components even accidentally many technicians have lost equipment's bottles of water or juices falling on equipment's by mistake.

86. Don't Overcharge Batteries- Some power back-ups and microphone batteries need charging but overcharging destroys. Don't keep your device plugged in at all times. This is because unnecessary charging can retard the regenerative capability of the battery. And the ability to hold a charge can drop off a year later. Usually, you can make a setting for your laptop to let it not charge when reaching 20%. Note: Sometimes you find your PC is plugged in but not charging. This is caused by settings.

87. Read manuals carefully for the sound we buy and Create a Backup for Your Important Files and System. As a computer owner, the most important thing you can do is to back up the important data stored on your hard drive. This tip is also a vital part of regular personal computer maintenance since unexpected hard drive failure, serious computer problems, viruses, etc. can cause data loss. Besides, system also crashes and cannot boot. You can lose very important information and data on sound system including music, songs that keep our media department.

88. All technicians when testing sound and during interludes should only play descent gospel praise and worship music from the library of our praise and worship collection to maintain our brand, tastes of consistency. Technicians can confuse our audience with mis-representation playing music we don't believe in is a terrible offense in our sound and technical team especially during loud sound checks or before or after sessions we should set the pace of good praise and worship to set pace or maintain the flow of anointing in every opportunity.

89. Where we are using electronic systems with software's we need to create a backup is designed to back up the Windows operating system, files & folders, disks and partitions on a regular basis. Differential and incremental backup are supported. In addition, file sync and disk clone can be realized by this software. Capture downloads of documents and software's that help run our sound effectively with USB flash drive, external hard drive, SSD, etc. To ensure your PC can restore to its previous state in case system crashes in the future, we recommend you to create a system image.

90. Run Antivirus and Malware Scans Regularly for sound software maintenance tip should go without saying but we say it anyway. Any computer should have conventional virus protection and spyware detection software to monitor the system for threats in real time and remove them to keep the sound software safe to offer you real-time virus & threat prevention, account protection, firewall & network protection, etc.

Alternatively, you can install an antivirus or anti-malware program on your computer, for example, Malwarebytes or Avast. Just run such a tool to perform a full scan for viruses, spyware, malware, etc.

91. Always Run Your Firewall- Windows Firewall in the operating system is the first line of defense against malware. It can filter some information from the Internet and block potentially harmful programs from installing. This tool should always be running. It is pretty useful when you install new apps from a third-party source other than the manufacturer or developer.

92. Check and countercheck Interconnections before switching on sounds wrong connections have brown up machines.

93. The amplifier can be placed as a table top unit. The is so installed that its location or position does not interfere with its proper ventilation.

94. All machines must be powered through an AC earthed mains outlet and earthed generators.

95. All connections must only be carried out or change after switching off the amplifier.

96. To avoid loud switching noise, always switch ON the amplifier after switched ON the connected audio input with it.

97 After operation first switched OFF the amplifier before the other units.

98. Diagrams of a typical amplifier connections on front and rear panel are shown below

99. Jack plugs of microphones of various audio sources are inserted in microphone sockets. The Volume level of each microphone's audio can be increased or decreased by the respected microphone volume controls. The overall volume of all microphones can be control by master control.

100) Speaker Connection- Installed sound systems commonly use either a direct connection (also called low impedance) or constant voltage (also called high impedance) amplifier/speaker

101) interface. Low Impedance box type speakers can be connected to COM & 4Ω or 8 Ω terminal strip directly according the impedance of the speaker.

102 The box speaker / Driver unit switch must be kept at Box speaker position. If by mistake the switch remains in Driver unit position the quality of sound will not be rich and natural.

103. No driver unit / Horn speaker / Column speaker (with 100V LMT) should be connected at this terminal strip.

104. Correct Phasing of Loudspeakers- When two or more speakers/units are installed in the same area and are facing to same direction, it is essential that their cone/diaphragm act in unison. Otherwise the sound levels of both speakers will be cancelled out. To avoid any mistake, the terminals of box speakers and the driver unit are marked '+' & '-'. Always connect

105. After sound check mark amplifier, mixers, equalizer for best sound marks and standards to avoid reinventing the wheel so that every time you are setting up sound it takes the shortest time to attain a certain standard of consistency to avoid sound being good today and terrible tomorrow distorted. Just like there is a standard set up for a wifi at home we can maintain this with MARKED STARDARD with note books and marks in the sound systems.

106. Setting of both amplifiers shall be according to type of load speakers connected.

107. Balance the equipment input to give you good ouputs- If speakers using LMT are connected the total power shall not be exceeding 500 watts for Booster & 350 watt for Amplifier. Bass & Treble controls of each amplifier can be adjusted to give optimum tonal quality of sound. This kind of system is ideal where both high and low impedance speakers are being used.

108. Speaker system impedance shall be matched to the output impedance of the amplifier and thus shall be connected to the corresponding tape of the amplifier. The box speakers / driver unit switch should be as per type of load connected.

109. During operation of the system any adjustment in the total quality of the sound if required can be made from the Master Amplifier.

110 Earthing- (a) Proper earthing of the entire installation (with appropriate earthing of the individual equipment also) is absolutely essential to avoid danger from any possible shocks to the users of the equipment's, the operating personnel or the audience.

(b) Earthing connections to the nearby water mains are of usually lower resistance than any form of buried earth electrode system. An equipment of installation may be satisfactorily earthed by means of connection to the nearest water supply mains by a good soldered joints. In the absence of a suitable water main, the earthing may be done by connection to other efficiently earthed object.

(c) The use of two or more separate earthing connections at different points on the system is inadvisable due to risk of trouble from circulating currents. The earth connection from water supply mains or other earthed electrode should be brought to an earth-busbar in the equipment room. The earthing connection to the installation equipments should be drawn from this earth-bus bar.

111) The screening leads of a microphone should have a separate insulated lead run direct to the earth connection. It shall not be connected to the electrical earthing of the installation which gives rise to hum. A minimum separation of 5 meters between the nearest wiring of the loudspeaker and the catenary system shall be kept. Screened cables & wires or cables & wires in metallic conduit should be used in electrified areas, so as to eliminate the effects of induction both electromagnetic and electrostatic. The cable screening conduit shall be effectively earthed at both the ends. If sectionalizing transformers are provided, earthing of the cable screen should be done on the two sides of the transformers. The value of this earthing resistance should be as low as possible and shall not exceed 5 ohms. The screened cables used for working the loudspeakers shall have a screening factor of 0.5 within the field intensity of 50V/Km to 450 V/Km at 50 Hz. It is desirable to run a main cable for the loudspeaker circuits as far away as possible from the catenary system and connect the loudspeaker at different points by distribution cables run at right angles to the catenary system. Wiring for equipment should also be screened (sheathed).

112) Safety requirements for amplifiers operated from electric mains The amplifier or amplifiers operating from mains supply shall conform to the requirement specified in IS: 9302 -Mains operated audio amplifiers. Fire and Explosion risk The installation of the system in a situation, where there may be a possibility of an explosion, or in an inflammable atmosphere, should as far as possible, be avoided. However, if it becomes necessary to have the installation in such a situation, it should not be vulnerable to fire explosion risks.

113. Vetting source of Noise - Noise is a very common, and sometimes a very difficult problem to solve. Noise comes from many sources. Some of the most common are Poor wiring in the location where the P.A. is being used, Fluorescent light, Dimmers, Poor design (particularly shielding and location of the mixer's power transformer), Magnetic fields induced by other nearby components (particularly power amplifiers), Radio stations or other transmitters in the area, Large motors nearby, Grounding problems (particularly when using equipment manufactured by different companies), Noise in the input signal (particularly guitar pickups), Poor cables (particularly on the inputs)

114) To eliminate noises- Now start plugging the sources back into the mixer/amplifier, one by one. Observe for noisy input. Take steps to replace the noisy input such as microphone, cassette recorder, guitar etc. If noise is still there than follow following few suggestions:

- Change your cables to better quality ones with a high degree of shielding.
- Wherever possible, use balanced sources (some manufacturers have both balanced and unbalanced outputs on their products. If they do, change to balanced.)
- Use of a balanced cable will even improve noise in unbalanced sources as long as the mixer inputs are balanced.
- Use direct boxes where possible for instruments being plugged into the mixer. This isolates the signal, converts any high impedance instruments to be balanced low impedance and allows you to "lift" the grounds on these devices. We will able to reduce or eliminate many radio signals, buzzes and ground hums with this method.
- Reduce the length of the cables.

- Make sure the input cables are not lying too close to a transformer, motor, amplifier or other source of magnetic radiation.
- Plugging the components of a P.A. system into different electrical outlets can sometimes cause problems. Wherever possible, try to connect all parts of the P.A. into the same circuit, even if you have to run extension cords to accomplish this.
- Turn any lights on dimmers off, or if this is not possible, turn them fully on.
- Reduce the volume output on the Amplifiers and increase the output on your mixer.

115) Fault-Finding in Live Productions- Sometimes problems are during set-up or sound check, and occasionally during the performance itself. Even in fairly basic PA systems there are plenty of possibilities for something to go wrong such as: leads can get pulled loose, batteries (even new ones!) can die unexpectedly, and amplifiers can overheat and shut down. Our first reactions shall be as given below:

- Stay calm! Panicking or losing your temper with people or equipment will not make the problem solve.
- Focus your attention in understanding that the signal is reaching to its destination or not. If not, why?
- Be methodical. Don't change connections, leads and components at random. Start diagnosing the problem along the signal path. Eliminate the possible causes of failure. If a microphone isn't working, replace it with one you know to be OK. If it still doesn't work, replace the lead with one you know to be OK.
- Be safe. Electricity kills. Never take the covers off live equipment (always disconnect from the mains before you take the cover off anything). Never replace fuses with any other conductor (wire, nails, and screws). If fuses keep blowing, the equipment is faulty and potentially dangerous. Never attempt repairs that need both hands while you are hanging off a ladder.
- Mark faulty equipment. If you find a lead is faulty, don't just put it back in the bag. Mark it faulty in some obvious way & put it to one side, and don't take it out again until it has been repaired and tested. The same goes for everything else, from microphone to mixer to monitor.
- Most of actual system faults are caused by faulty cables. Cables may fail at the solder points (bad soldering and poor strain-relief are the most common causes of this: cheap cables and connectors are a false economy), and although this normally results in loss of continuity, sometimes a loose end can make contact with one of the other conductors, causing short-circuit conditions. In the worst case, this can cause failure of the preamplifier or amplifier stage driving it.

116) Mains hum- Mains hum is a low frequency hum or buzz which increases in volume as the PA system is turned up louder. The most common reasons for mains hum is when two pieces of mains powered equipment are connected via an audio cable (e.g. jack plug). For example, mains powered monitors connected to the mixer. If there is a mains hum problem, then first identify which piece of equipment is causing the problem. Disconnect all the equipment from the mains and also all the connecting signal cables between the equipment. Now start introducing the equipment piece by piece until the problem is noticed. Never, ever remove an earth wire from a mains plug to avoid the problem.

117) Feedback Acoustic feedback will occur when the microphone picks up audio from the loudspeaker and transmits it back into the amplifier. A "loop" of sound occurs which builds in intensity to a piercing scream. This is usually due to the volume being too high or the microphone too near to the speaker. The scream won't stop until the loop of sound is not broken physically. Every venue has a point where feedback cannot be avoided. However following points to be noted:

- Is the microphone being used correctly.
- If microphone is far away from the mouth.
- Are the microphones cheap as they may be more prone to feedback.
- Are your speakers positioned far enough in front of the line of your microphones. Try moving them forward a little at a time.
- Change the angle of PA speakers. Even slightly changing the angle of the speakers can affect feedback enormously.
- Feedback occurs at varying frequencies. You may be able to adjust the EQ on the mixer to cut down the feedback.

118) Precautions During Installation

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.

- Do not cut, kink, or modify the power supply cord. Never use damaged power supply cord. Avoid using the power cord in close proximity to heaters, and never place heavy objects including the unit itself on the power cord, as doing so may result in fire or electric shock.
- Be sure to replace the unit's terminal cover after completion of connections. Because high voltage is applied to the speaker terminals, never touch these terminals to avoid electric shock.
- Be sure to ground to the safety ground (earth) terminal to avoid electric shock. Never ground to a gas pipe as a catastrophic disaster may result.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down, causing personal injury and/or property damage.
- Never plug in or remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Do not block the ventilation slots in the unit's cover. Doing so may cause heat to build up inside the unit and result in fire.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- Always use thick cables like cable type 40/36 for low impedance speaker connections to avoid power losses in the cable.
- Do not exceed 90% of the amplifier's output power when using 100V line (Speechonly).
- Do not exceed 70% of the amplifier's output power when using 100V line (High level music or voice).
- Speaker Connections: Low Impedance Speaker Impedance taps of 4 Ω , 8 Ω and 16 Ω have been provided for direct connection of speakers to the amplifier when the distance between the amplifier and speakers is less than 50 meters. Use thicker cable for connections. Be sure that the total impedance of the speakers is equal to or more than the impedance specified on the terminal strip.
- Phasing Of Loudspeakers: When two or more speakers/units are installed in the same area and are facing in the same direction, it is essential that their cones/ diaphragms act in unison. Otherwise, the sound level of one speaker will be canceling the sound level of the other. To avoid any mistake the terminals of all driver units are marked L1 and L2.

118) Detecting & rectifying Wrong / Right connections

- Speaker Connections: The loudspeaker connections must be made to only one selected impedance i.e. either to "COM" and 4 Ω or to "COM" and 8 Ω "COM" and 16 Ω terminals on the amplifier. When speakers are connected to any one of the above impedances, make sure that no speaker is connected to either 70 V or 100V line output terminals. Making connections to two impedance tape simultaneously will cause overloading and damage to the amplifier.
- Selection of Loudspeakers: Proper selection of column speakers/driver units-horns and their appropriate impedance matching to the amplifier, avoiding over loading and short circuit while making connections are of utmost importance in speaker installations. Any mistake made would not only result in inferior sound quality but would also become a cause for damage to the amplifier.
- Never connect speaker units having LMT in series. They shall be connected in parallel as shown below:
- If found following irregularity during operation, immediately switch off the power, disconnect the power supply plug from the AC outlet. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock:
 - If you detect smoke or a strange smell coming from the unit.
 - If water or any metallic object gets into the unit
 - If the unit falls, or the unit case breaks
 - If the power supply cord is damaged (exposure of the core, disconnection)
 - If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open or remove the unit case as there are high voltage components inside the unit.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert or drop metallic objects or flammable materials in the ventilation slots of the unit's cover, as this may result in fire or electric shock.

- Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.
- Make sure that the volume control is set to minimum position before power is switched on. Loud noise produced at high volume when power is switched on can cause the sound to distort. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- Remove the dust accumulated in the unit over a long period of time, a fire or damage to the unit may result.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.
- Avoid jointing of microphone cables. If it is unavoidable, make sure a good screened connector is used.
- Ensure that all loudspeakers are in phase there is no short circuit on the loudspeaker line before connecting to the amplifier.

119) Get good sound quality by adjusting the volume coming from the sound system. It might seem silly, but sometimes your speakers could lose their volume if they're too low or high. Many speaker systems will come with safety triggers that prevent them from blasting too loudly. Your device might also stop it from going too high.

- 120) Check if the speakers are muted. Muted speakers won't ever produce sound, so your fix might be as simple as unmuting the problem. Check your speakers, the receiver, and the device you're using to play the audio. All three of them should be unmuted. Don't forget to inspect your surround sound, too!
- 121) Repair, replace, or connect any electrical wires. According to Techwalla, wires are often the sole cause of no sound. Your speakers might drop or become crackly if there are loose connections, but disconnected wires won't be able to produce any noise. Check all of them to ensure they're plugged in snugly.
- 122) Inspect the system's output device (smartphone, laptop, TV, entertainment system, etc.). These devices could be the source of the problem since they have separate mute buttons. Before checking them, lower your speaker's volume, so they don't blare loud noise once you make the necessary adjustments on the device.
- 123) Ensure you're setting the speakers to the proper channel. Some speakers have multiple channels, so it's essential to check if they're in the proper setting. If your speakers are connected to Channel 1, but the receiver is playing audio to Channel 2, you won't get any audio coming through them.
- 124) Audio Distortion is a Common Issue If your sound system sounds garbled or inaudible, the fix might be easier than you'd think. Before you buy a new speaker or fork out hundreds of dollars on pro-level repairs, we've made a list of quick solutions for you to try.

Below, you'll find a handful of reasons the audio might sound distorted or distant.

- Check if the speakers play from another device. If you're unable to hear clear audio, plug the speakers into something else. If they work fine, then the device is the problem; If not, the speakers need to be fixed. Let's cover a few repairs in the following four options below.
- Switch the cable if necessary or applicable. Old, twisted cables start to wear down over time. Your cables should be neat, tidy, and organized to prevent them from breaking or stripping apart. If any of the cables look broken or busted, it might be time to replace them. This change can also prevent safety hazards.
- Loose wire connections, cables, and plugs can cause audio distortion. As we saw in the previous section, cable and wire connections can take a toll on your sound system. Ensure they're all connected correctly. You'll notice this fix is found on almost every speaker problem in this list because it's such a common issue.
- Bluetooth connectivity often distorts with distance or interference. Anything blocking your Bluetooth device from a clear pathway to the speakers can cause fuzziness or distortion. This problem includes walls, doors, couches, furniture, and other big, dense structures.
- Check if a coil is blown. Electronics Notes states you can repair a blown coil by centering it on the speaker. If it's broken beyond repair, it's best to contact the company to get a replacement. Many speaker coils are brand-specific (or at least size-specific), so ensure you're getting the correct coil replacement.

125) **Check if Your Speakers Are Blown-** Blown speakers often seem like a death sentence, but they're not the end of your sound setup. In fact, most blown speakers can be repaired without replacing any of the parts. All you have to do is test the system to ensure that they're actually blown, then adjust the coils, cons, fabric, or wiring. If they're broken, then it might be time to bring them to a repair shop. Here's the three-step procedure to check if your speakers are blown:

Reduce the Volume- The first and most important step is to lower the volume. If you think your speakers are blown, the worth thing you can do is turn them up higher to see if you can hear them clearly. Blown speakers can worsen beyond repair if you're not careful enough. Lower the volume to the point where it's barely audible, then proceed to the next step.

Adjust the Bass and Treble- Extremely high bass or treble have been known to impact a speaker system negatively. The constant vibrations can tear through the coils and fabric, so it's important to lower both of them after changing the volume. If you're playing the speakers from a computer or smartphone, lower the bass and treble on those devices if applicable.

Inspect the Wires, Coils, and Fabric- In some cases, you can actually sew or seal the fabric if it's separated from the speaker cone. You can also use silicone sealant to allow the fabric to flex instead of holding it in one place. The cone should be able to move around when the bass is going. Check the wires and coils behind the fabric if they're exposed or loosened. Many people think a blown speaker has to be replaced. Truthfully, you can either repair them for much cheaper or make a few minor adjustments to bring them back to their original condition.

Tampered Source Material Can Ruin Sound Systems- You can upload a song to a computer program, increase the gain several times, and burn it on a CD or digital track. This process might sound familiar and harmless, but it's one of the quickest ways to break your speakers. They can overheat, blow out, or become completely unusable. The source material is just as important as the speakers themselves.

Don't Use Third-Party Digital Programs- If you raise the gain by two or three times the track's original specs, you might think it sounds better, but it can ruin your speakers. Some go back to change the gain settings thinking it'll improve the volume and let them play music louder on their sound system. While this is true, adjusting the gain too much can shred your speakers.

Keep the Computer's Volume at a Reasonable Level- If you're playing your speakers through a computer or similar device, you should lower the settings to a reasonable amount. Your speakers can play quite loud, but that doesn't mean you should turn them as high as possible. Lower the device's volume and adjust the speaker volume to fit the same settings; That way, you don't have to worry about them going too high from minimal changes.

Use CD's, Entertainment Systems, or Vinyl- These three sources don't go too sound since they're designed for speakers. Digital content is acceptable, too, including smartphones and laptops. However, making adjustments to these devices makes it easy to destroy your speakers. Stick to the stock settings to prevent audio clipping or distortions. There's no reason to pump a song or movie's gain and volume higher than it's designed to go. These adjustments are fun in the short term but can cost you quite a bit of money on repairs or replacements if they damage your audio equipment. It's best to let the track work its magic without modifications.

126) **A Lack of Bass or Treble-**We all love blasting the bass to our favorite tunes and bringing out the beauty of each instrument with the treble. Unfortunately, our speakers don't enjoy it as much as we do. If you're wondering why your speakers aren't showing enough bass or treble, you might be surprised by the causes and solutions.

- Cheap speakers distort the treble and bass at a high volume. The treble and bass often can't keep up with increased gain or volume. When the speakers get too loud, the subwoofers and tweeters will sound distorted or won't produce noise. Louder both settings, then try the next suggestion.
- Adjust the source to ensure the treble and bass aren't too high or low. Sometimes, your speakers will have high treble and bass, but the source isn't adjusted. For example, if you're using a laptop, check the program's settings. You might have the treble and bass lowered, which means they won't play through the speakers.

- Ensure proper placement of the speakers if you're using them indoors. Your speakers should have plenty of room on all sides. If they're pressed against the wall, and the subwoofers don't have room to produce the sound properly, you won't notice the bass as much as you should be.
- Check if the tweeters or subwoofers are too big or small for the speakers. Improper sizes can make them malfunction, rendering them useless. Thankfully, this is never an issue when you purchase them brand-new from a store. Consider asking the seller if you're getting them from a third-party aftermarket deal.
- If all else fails, inspect the wires and other connections. The wires and cables can always take a toll on your sound system. If they're not connected properly, you won't hear bass, treble, sound, and so on. The cables should wiggle or fall out. If there's a recurring issue, you might have to get replacements. There's no denying the influence of bass and treble in music. They're some of the most important parts of listening to songs, watching movies, and more. Your audio system should have separate knobs for both settings, so play around with them until you notice a difference; Otherwise, check the electrical connections or the connected device.

Malfunctioning Speaker Channels- It might seem silly, but your non-working speaker channels might be caused by user error. If you've been making several adjustments or not paying attention to the cables, there's a high chance you can fix everything very quickly.

127. Here are our top four ways to fix speaker channel issues:

1. Switch to a different channel. Try switching channels since old speaker systems can have malfunctioning channel options. If they work on another channel, you're good to go. This simple fix is often enough to get rid of the problem and let you listen to the speakers again.
2. Make sure the cables are plugged into the correct channels. If they're wired into the first channel, but your receiver is set to the second channel, you won't have any audio output. In some cases, you might hear a slight crackle, which could be confusing since it'll make you think something's wrong with the speakers and not the channels.
3. Try the speakers on a different device. If they're not working after you plug them into the proper channels, try using your speakers with anything else you have around your home. If they don't work, there's another issue afoot. If they do, then there's something wrong with the channel connections.
4. Contact an electrician or speaker expert to check the wiring. While we'd all like to DIY every sound system repair, you might need to contact a professional. Electrical issues can be hazardous, so don't take the risk. You could consider asking for expert assistance for overheating, buzzing, and humming, too. Try these solutions to get your speakers back on track. For more information about popping speakers, loosened cables, and strange audio interferences with your speakers, proceed to the next section.

128. Popping Sounds Coming From Speakers Nothing's worse than playing your favorite song or movie with random pops and blips throughout the track. These noises could start small and grow into an unavoidable problem, so it's a good idea to stop them as soon as possible.

Below, we'll cover everything you should know about popping sounds from speaker systems.

- Turn off electrical devices to reduce possible interferences. Anything nearby can interrupt the signal or wires. If you're using an entertainment center, consider turning off the TV and other unused electrical appliances. You could also move smartphones, house phones, and everything else away from the area.
- Check all of the wires to ensure they're snug and not torn. If the wires are exposed or stripped, small disconnections could mess with their performance. This issue could cause popping and humming, but it'll eventually lead to no sound coming from the speakers. The good news is most small speaker wires are relatively affordable.
- Consider resetting the receiver to its factory settings or replacing it (if applicable). According to Sony, restoring the receiver to its like-new condition could fix the problem. While it's not a common solution, it's worth trying this step if you tried everything else without any success.
- Inspect all of the surrounding cables and plugs. Move the cables away if they're not contributing to the speakers. If they're a part of a different system, they shouldn't be touching the speaker's wires and cables. Minor electrical interference could make loud humming or popping noises, which sound similar to a guitar amp's cable when it's touching another cable.

- Your device might be the culprit. Another simple solution is to check your input device. If you're using a computer and your WiFi isn't strong enough, it could cause lagging and popping. Disconnect your device from the speakers and listen for the noises through your device's sound system.

You don't have to put up with interrupting popping sounds anymore. These solutions are straightforward and can prevent the noises from returning. If you notice a humming, most of the fixes are the same. However, we'll cover a few differences below.

129. Humming is a Frustrating Audio Concern-You might've heard a constant humming noise from your speakers or amplifier, that sounds like an audio interference. Whether they're in your car, home, or anywhere else, these buzzing noises can ruin your listening experience.

Let's break down a five-step process to get rid of them for good.

1. Switch to an AC ground adapter to limit the buzzing from the subwoofers. If you're using a three-prong plug, it could cause a constant humming noise. We suggest using the 3-to-2-Prong Grounding Converter by Supply Guru. This budget-friendly adapter comes in a six-pack and can be the easiest solution to the problem.
2. Make sure you're using the proper cables (outdated or improper cables might work fine, but they can produce a buzzing sound). Just because the cables fit in the channels or input and output areas doesn't mean they're the correct type. Check the speaker's user's manual to ensure you have the proper size.
3. Consider an audio isolation transformer to reduce or get rid of the buzzing and humming noises. They can balance signals and adjust the AC voltage, which is often the cause of annoying buzzes or constant humming noises.
4. Test the electrical connections since overloading a circuit can cause it to overheat and buzz. Use a multimeter to ensure you're getting the same voltage on every electrical connection. Ensure you're not adding too many plugs to the wall or power strip. All power strips should come with a maximum load capacity, so check it beforehand.
5. Straighten and organize all of the audio system's cables. If they're too close to one another, they'll cause a buzzing sound. Exposed wires touching one another will make a loud sound. The closer they are, the louder it will be. Tangled cables can wreak havoc on your speaker's audio quality.

We've covered every surround sound problem with numerous solutions to prevent them from coming back.

- Check if your TV or other device is set to the surround sound mode. Many devices have a selection designed for surround sound compatibility. If your device isn't on the correct setting or channel, your surround sound system won't work. Furthermore, ensure the speakers are turned on.
- Disconnect and connect all cables and wires. Loose cables or improper connections can make your surround sound system a bit weak. Many of these setups have dozens of cables, so it's challenging to know which is the problem. Instead of testing each of them, you could unplug and plug every one of them.
- Test the receiver settings until you find the proper channel. Surround sound systems have to all be on the same channel. If they're not using the proper channel, it won't go through the system.
- Bluetooth speakers require reduced interference. Bluetooth surround sound speakers are convenient because they're out of the way and use minimal cables. However, you have to create a clear, decluttered path between all of the speakers and the primary playing device. We'll discuss more Bluetooth speaker issues in the next section.

130) Sound tests at night without other distractive voices be careful not to Listening at Night or early morning- Critical listening or equipment testing should be done in the night hours. This rule obviously applies to one who lives in a big city. Non noticeable city noise affects our hearing and we are basically not able to hear what our system delivers to us during the day. Due to city noise is several times lower in the night, all hidden aspects in hi-end appear in the night and the system delivers its full potential. For more information, please check Noise

131) - Heat and Humidity; Humidity and heat have serious influences on sound. Systems cannot generate their best sound, power and dynamics in a warm and damp weather. I am not sure why this happens but it happens. There may be two reasons: The damp air is heavier in such circumstances; thus the loudspeakers are not able to pull enough air into the room. Or the loudspeaker materials may soften and behave differently in warm weather. Cooling the listening environment before listening session eliminates that effect.

132- Finding the Correct Listening Distance; The sound is spread in waves called frequency. The volume of every frequency will be different in connection with the distance from the speakers. In terms of the volume, frequencies will be up and down when the distance is changed. Especially higher mids and treble sections will vary between 20-5 centimetres. Such frequency peaks can be easily recognized by listening.

133) Put a test CD/ music that contains different test frequencies. For instance start with mono 1000 Hz at the listening chair. Then stand up and walk very slowly through your system. (Preferably with your closed eyes). You will immediately realize that the signal will have ups and downs in volume while you are moving as if somebody was turning on and off the volume control. The main frequency of the music and the one which is closest to human sound is 1000 Hz. 1000 Hz is your starting point. 1000 Hz will be at its peaks so many times in connection with the distance of your listening chair. Find the closest distance to your current listening chair that the 1000 Hz is at peak. The ups and downs in that band should be changed around 50-70 centimeters. This is the best location to hear the middle frequencies but it is not the best location yet to achieve the best frequency spectrum. It is just the starting point.

134- Stadium surroundings whether trees, estates, walls , open windy place will affect your sound setting because of the Acoustics absorption value or sound reflections in hall or su; Room Acoustics is the most known but the least considered part of Hi-End. A conventional speaker may throw % 40 of the sound directly to listener; rest of the sound comes through the walls by reflections. Reflection means the timing difference of the original signal, hence an additional acoustic which does not exist in the original record. Within such a complexity of reflections, a part of the original signal will come late due to the front wall or ceiling or etc., a part of the original signal produced by the left speaker will come as if coming from the right speaker and vice versa. Such a complex listening environment will demolish the stereo imaging and channel separation. Some audiophiles are happy with this case due to speakers are seem to be better disappeared and soundstage is wider and deeper. Some producers add additional mid/treble units to the back side of the speakers (dipoles) to emphasize such effects.

135- Precise Focus and Loudspeaker Placement; This is also another known but the least considered part of Hi-End. It is critically important to locate both speakers at the exactly same distance to achieve precise focus. Distances should be very carefully measured and both of the speakers should be placed exactly to the same distance through listener. The setting and distribution of speakers is important to evaluate the clarity of sound at different points so when doing sound checks it is important to go to different point of stadium with audibility machines or sharp ear to ascertain that all delegates will be well served at different times. When stadium parks again since the sound reflection index and acoustic change our sound team must be positioned in various parts with communication gadgets to Text or Call on sound islands where there is no clarity. Besides the distribution of speakers in the ground and angles the volume setting along with use of condensers, good mixing, equalizers, balancing skills can ensure everyone hears from various points etc. . Sound signals are distributed in waves as explained in section five. The people who tried the settings in section five will realize that, the peaks of frequencies vary in conjunction with the distance from the speakers. Especially the treble frequencies will vary a lot by only one centimeters of a change. In such cases, if one speaker is just one cm closer to the listener, some frequencies will be heard a lot from one speaker but will not be heard from the other speaker. If the upper harmonics of the human sound consist of such upper frequencies, (it is!) this is obvious that the sound will move from the middle to left or to right. Moreover, within that case, some frequencies will be collided in full phase and will be exaggerated, some others will be collided by inverted phase so are destroyed.

136- Mechanical Vibration of Electronic Units; Quite a lot of vibration absorption feet and platform kinds exist in the market. They are to be placed under the electronics/speakers. Such materials have two intentions;

a- To eliminate the external vibration coming through the unit

b- To eliminate the vibration of the unit itself (CD driver motor, speaker cone vibrations etc.)

Most popular ones are the cones (spikes). I believe the proper usage of spikes is not known very well. Rather than being a vibration absorber, spike is a kind of transmission material that transmits vibration from one point through the other point. In other means, vibration is condensed to one point and mechanically carried to other platform by the spike but not eliminated. If the connection surface is stiff (for instance marble, granite, etc.) such vibrations are passed to that surface. Underneath of such a stiff platforms (marble, MDF, glass, granite) must be covered by an elastically material such as cork, mouse pad, neoprene rubber or similar. The vibration can not pass from a stiff platform to an elastically platform

and will be transposed to heat between. Direction of the cone is also critically important. The direction should be in conjunction with the intention of vibration transmission. May be the last thing about the cone is the cone should be in touch with the chassis of the component directly. If any kind of rubber, double sided band, blue tack or such an elastic material is put between cone and the unit that material will try to transpose the vibration and the cone will not work.

136) The grounds where you put speakers matters- soft grounds or covering by an elastic material such as cork, mouse pad, neoprene, wood, soft mattress can reduce sound vibration etc. How does it effect the sound is, you have more powerful but more clear and tight bass, relaxation at the mid and top frequencies. The speaker has to be connected to the platform via a cone, not by an elastically feet. The sharp end of the cone has to direct the marble but not to the loudspeaker. Suspended speakers on sound hoisted ranks helps elimanite as they give a good positioning either horizontal or vertical curves depending on venue, sound, heights can give a good platform to adjust sound to fulfilment.

137) Different weather parterns also affects sound reception at diffirent times can affect sound waves- Rain, snow, winds, Especially in wet weather and in fully carpeted listening environments, static electric become an issue. The carpet is charged with static electric which can be passed through the electronic equipments via the rack and/or via human touch. Static electricity on the carpet is such powerful that when checked in the morning before somebody walks on it, can be clearly seen by simple tools sold in Shack. More cautions during rain to cover the full sound speakers, power boxes and connections especially avoid naked wires they won't survive water rain or pools can cause short circuits to destroy the whole sound. In order to eliminate the effect, the loudspeaker stands and the equipment racks should be connected to earth by a thin wire. Moreover, the loudspeaker cables and interconnects should be lifted away from the floor due to the same effect.

138) - Loudspeaker Distance from the Front Wall and hard surfaces; Loudspeaker producers generally recommend the distance of the speaker by the front wall (the wall behind the speakers). Generally speaking, the speaker should be located as far as possible from the front wall. (Side walls as well) If they are so close to the wall, bass standing waves will be reinforced (explained in article five) and mid/treble band will be compressed due to excessive bass energy. Some audiophiles find the desired bass volume by placing them closer to front wall which is not correct. One thing should be considered that such bass increase is not due to the original sound but it is the consequence by the room response called coloration.

139- Auto former / Transformer Passive Line Stages; The new developed technologies in hi-end industry made the pre-amplifiers questionable. Other matters that affect sound clarity and maintenance include

- 1).Ensure All The Screws Inside Are Secured
- 2).Making Sure Connections Are Secured
- 3).Watch For Any Failed Elements In Your Home Theater
- 4).Occasionally Remove Dust From Your Speakers
- 5). Cleaning Things Like Switches & Knobs
- 6).Using A Surge Protector Can Be Helpful
- 7).Placing Receiver & Amps In Well Ventilated Areas
- 8).Cleaning Blu-ray Players & Receivers
- 9).Making Sure Your Cables Are Situated
- 10).Bi-Wire Connections Can Experience Issues Over Time
- 11).Cleaning Your Projection Screen & Projector Chassis
- 12).Cleaning Dust & Fingerprints On display screen
- 13).Preventing & Remediying OLED Burn In
- 14).Adjusting For Display Color Shift
- 15).Adjusting Projector Focus
- 16).Fixing The Alignment Of The Projector Unit
- 17).Fixing The Panel Alignment Inside The Projector
- 18).Correcting Projector Lens Shift
- 19).Cleaning The Projector Lens
- 20).Fixing The Mount Of The Projector Unit
- 21).Cleaning & Replacing The Projector Filter
- 22) Good assembly and stability or racks and LED screens

- 23) Stability of pulpit, podiums, microphone stands and organization of cables in the pulpits that they are not stumbling people leading to disconnections
- 24) Speakers facing each other can produce harming as microphones facing speakers equally
- 25) Power stability and protection is crucial with generator switching if not sure use stable generators from onset and run lighting on government power or both on generator
- Our Generator Operation and Maintenance Tips

1. What grade of gasoline should I use?

Check with your manual to be sure, but most gas models should use unleaded gasoline (at least 87 octane). Turn the engine off and let it cool before refueling. Never refuel while the engine is running.

2. Do I need to check the oil for a new generator before starting it?

It is always a good idea to check the engine oil before starting your generator. Some generators may be shipped dry, some may have a small amount of oil that was used to perform a bench test on the unit, and some may have a full oil tank. Running any engine on a dry oil tank will cause it to seize up and you will end up with a 50 pound brick instead of an engine and it won't be good for much besides a paperweight for the world's largest desk. Checking and changing your oil should become a regular facet of your generator maintenance.

3. Can I have my generator installed in my house?

Yes. You can have generators installed with generator transfer switches if you plan on using it as a back-up power source in the case of a power outage. A licensed electrician should do the installation to make sure that the generator is installed properly and up-to-code.

Back feeding electricity is extremely hazardous. Always trip your service disconnect at your outside meter box to prevent back feeding. If you do not have a service disconnect, you should contact an electrician to add one and the proper receptacle for hooking up a portable generator. Do not plug your generator into your home through a dryer outlet.

4. What type of extension cord should I use with my portable generator?

For Emergency power to appliances it is recommended to use a 12 ga. outdoor extension cord and a multi-outlet power strip with a minimum of 100 joules rating.

5. Is it safe to operate my generator indoors?

No. Engines using fuels such as gas and diesel produce a deadly gas called carbon monoxide. This gas is odorless and colorless, as well as deadly, so it is highly dangerous.¹

6. Can you supply generators larger than 12,000 watts?

Yes. We have all types of generators from 8,000w portable gas models for use on the jobsite to diesel generator sets that can supply a continuous output of 461kw for use in large commercial settings, such as hospitals. A licensed electrician should perform the generator maintenance on these units.

7. Can my generator handle a load as soon as it is turned on?

No. You should have the generator running before a load is applied. Similarly, you should not shut the generator down while it is still pulling a load. The RPM (Rotations Per Minute) are set in the factory, so you should not change the engine speed.

8. How long will my generator run on a full tank of gas?

This will vary greatly depending on your generator, its capacity, the size of its fuel tank, and the size of the load you are placing on it. Check with the manufacturer to learn more about your generator.

Generator Troubleshooting

9. Why is my generator having a hard time starting?

When your generator has not been used for a long period of time, it may be hard to start. Begin your generator troubleshooting by looking all around your generator to see if it sustained any trauma or has any broken parts that need replacement. If it does not, and you have already opened the fuel valve, skip down to the generator maintenance section, and make fix any problems that need to be fixed. This is usually because there is old gas in the tank or fuel filter (17 & 18), the battery (22), the spark plug (23) or the carburetor (24). If it still will not start, you will need to take it to a mechanic.

10. What do I do about an engine that falters?

Generator troubleshooting for an engine that falters will often come back to the fuel filter (17). If replacing the fuel filter does not fix the problem, it may be the carburetor (24).

11. What do I do if my engine keeps shutting off?

Generator troubleshooting for an engine that shuts off while running will usually start with checking the air filter (21). If this is not the culprit, it may be a clogged fuel filter (17), insufficient gas, or your load may simply be too much for your generator to handle.

12. Why is no power available if my motor is running?

First check the device you are trying to power. Plug it into a different source that you know to be running to check if the fault is there. This could also be caused by a tripped circuit breaker, in which case, you can simply close the circuit. If neither of these things is the culprit, you will need to have your generator looked at by a mechanic.

*Note: If you close a circuit breaker and it continues to open as soon as you reapply the load, this is a sign of a load that is too heavy. You need to check the limits of your machine. If you are within limits and the breaker is constantly tripped, then you need to have your generator serviced by a professional.

Generator Maintenance

13. How do I check my oil level?

Locate the dipstick and remove it. Identify the full mark on the dipstick and the oil line indicating the how full the oil tank is. If more oil is needed, fill to the indicated mark on the dipstick, but take care not to overfill. Change the oil per the manufacturer's recommendation to avoid further generator maintenance.

14. What kind of oil should I add to the engine?

This question depends on the engine manufacturer's specifications. Generally, high quality 30-weight detergent is acceptable for summer conditions; high quality 10W-30 is acceptable for winter conditions, but please refer to your engine manual for oil recommendations.

15. Should I turn on my generator if I have not used it for a while?

Yes, this is one of the simplest preventive maintenance services you can do for your generator. Running a generator with a load occasionally is a good idea. Running it once a month will prevent gas from producing a gum on the carburetor.

16. Do I need to remove the gasoline before storing my generator?

Removing the gasoline is always a good idea when storing your generator for a prolonged period of time, especially if you plan on storing it inside. It is never advisable to store combustible materials inside your home.

17. Do I need to use a fuel stabilizer?

As mentioned above, it is not a good idea to store gas in a generator. If you are storing gas in a can for your generator, however, a fuel stabilizer is a good idea. Remember; do not store gas in a confined space such as a car or your house.

18. How do I change a fuel filter?

This can vary by manufacturer, but for most inline fuel filters, you will simply close the fuel valve, remove the clamps on either side of the filter and pull the old one off. Look through the filter to ensure you can see light shining through. If you cannot, it is time to replace it. To replace your fuel filter, just do the reverse process, but make sure to keep the inside of the filter clean. If your filter has an arrow on it, point it in the direction of the

19. How do I change old gasoline?

Check your manual for the manufacturer's recommendations. Some units can simply be drained and primed with new fuel, while other manufacturers call for a more complete generator service including replacement of old lines and filters along with a cleaning of the carburetor and tank.

20. How and when do I need to change the oil filter?

Generator maintenance tips from most manufacturers recommend changing this when you change your oil so you will not have the new oil being filtered through old impurities and gunk.

Replacing an oil filter is often as easy as unscrewing the old one, applying some oil to the gasket of the new filter (for lubrication) and screwing on the new one, but it is always a good idea to check the manual for your specific machine.

21. How do I change the oil?

Regular generator service involves changing the oil. A good tip is to run your generator for a few minutes first to get the engine warm as this will help the oil and contaminants to drain easier. You will next place an oil catcher under the oil pan and remove the cap. Replace the cap and change the oil filter. Now you can fill the engine with the manufacturer's recommended oil and start the generator again. After running for a few minutes, turn the generator off and check the oil level once more. This is one of the most important service you can perform on your generator.

22. How do I change the air filter?

Checking the air filter should be a regular part of your generator maintenance checklist. Air filters vary greatly by engine, but the basic idea is the same: when one gets dirty and cannot draw the needed amount of clean air (or the engine must work too hard to do so), it is time to replace it. Some air filters are rings with no center, some have centers and some are flat pieces. Check the generators manual to see how to replace your generator's air filter.

23. How do I change the battery?

If your generator troubleshooting process has lead you to the battery, you may be able to fix the problem with a simple cleaning. If you have corrosion on the connections of your battery, shut the engine off and use a solution of baking soda and water, along with a brush, to clean the contacts. It is not a bad idea to clean your contacts periodically as a part of your regular preventive maintenance. If they are clean and you generator still will not start, you might need to replace the battery.

You can use a battery tester to troubleshoot your battery and see if it needs to be replaced. If you are in need of a new battery, be sure to select the right one per the manufacturer's recommendation. To replace your battery:

- a. Turn off the engine
- b. If you have not cleaned the contacts already, do that now
- c. After loosening the nut on the negative (black) cable, remove it from the battery
- d. Detach the positive (red) cable in the same manner
- e. Remove the bar or clamp holding the battery in place
- f. Remove the battery and clean the tray in the same manner you cleaned the contacts (you can also clean the cable connections again in this step since they are off now and you can clean down inside of them)
- g. Place the new battery in the tray and replace the bar or clamp to hold the battery in place
- h. Spray the battery terminals with a special spray to prevent corrosion
- i. Attach the positive (red) cable and then the negative (black) cable
- j. Ensure that everything is properly tightened

24. When should I change my spark plugs?

Again, different manufacturers will have different generator maintenance tips, but most will say something like "every 100 hours or once a year." You may also need to replace a sparkplug if it is worn and cracked. To check this:

- a. Disconnect the wire
- b. Clean around the old sparkplug to prevent debris from falling in once you remove it
- c. Use a spark plug socket to remove the old spark plug

Clean the spark plug with a spark plug cleaner and a wire brush. If there are any persistent deposits or cracks in the porcelain, replace it.

When replacing a sparkplug, it is important to adjust the gap between the electrodes to the manufacturer's specs with a spark plug gauge. When the gap is properly set, you may replace the spark plug and re-attach the wire.

25. How do I clean my carburetor?

Cleaning of a carburetor is a more complex procedure and should really be done by a mechanic. You will have to unhook the fuel line (and maybe even remove the fuel tank) to get it off, and a proper cleaning requires you to take apart the carburetor and use carburetor cleaner to clean the inside of it.

26. How do I add engine oil through the spark plug hole?

Take out the spark plug and pour about a teaspoon of oil down the hole. Replace the plug after pulling the recoil a few times to properly distribute the oil.²

27. When do I need to put oil in the spark plug hole?

Again, this is a good idea if you will not be using your generator for a prolonged period of time. Adding a little oil in the sparkplug hole will inhibit the formulation of rust, and save you from further generator maintenance.

28. Where is the best place to store my generator when I do not need it?

The ideal place to store your generator is a place that is sheltered, dry, clean, and not near any sparks or flames. Remember to remove the fuel and oil the spark plug holes before storage.

29. Where can I get generator maintenance parts?

Parts can be sourced from Ultimate Washer. We have many Honda engine parts on our website, but if you cannot find what you need there, contact us for further assistance. Warranty for your engine is available exclusively through the Engine Manufacturer. You can check the Yellow Pages (small gas engines or similar) for engine shops servicing your product. In many cases warranty work can be performed by that location as well. If you are unable to locate a warranty repair location call on us and we will gladly provide an engine warranty contact.

30. Can you provide a Generator Maintenance Checklist?

While service intervals will vary greatly from one manufacturer to the next, here is a basic generator maintenance checklist to work off of:

Clean Generator- Clean with Towels and a Degreaser Every 1 Year and Check for Leaks

Change Oil- 25 Hours or 1 Year (Should Also be Changed after the First 5 Hours)

Change Oil Filter- At Every Oil Change

Change Air Filter- 25 Hours or 1 Year (Should be Cleaned Regularly)

Change Spark Plugs- 100 Hours or 1 Year

Check Fuel Filter- 100 Hours or 1 Year

Check Battery- 100 Hours or 1 Year

Add Fuel Stabilizer- When the Generator will be Stored for More than 1 Month

Run Generator with a Load- Every 1 Month

Register to serve in this department as we serve to build the Kingdom of God be steadfast, immovable always abounding in the work of God knowing that our labor in the Lord is not in vain for God is a faithful rewarder of those who seek Him diligently 1st Corinthians 15:58- THY KINGDOM COME



**BY DR LUKE MWANGI AFTER LONG EXPERIENCE IN
CRUSADE SOUND FOR MANY YEARS**

