



EXTEND YOUR VOICE WITH
AMPLIVOX[®]
 PORTABLE SOUND SYSTEMS

WIRELESS SOUND FOR PORTABLE SOUND SYSTEMS

Our SW805A Amplifier - The Heart of Every System!

NEVER RUN OUT OF POWER!

1. Talk for up to 200 hours on a single set of 10-D Cell alkaline batteries (not supplied).
2. Or, use the **S1460 International AC Adapter/Recharger** to plug in virtually anywhere in the world.
3. Or, use the **S1465 NiCad Battery Pack** with the **S1460 Adapter/Recharger** for a rechargeable system.

ALL SOLD SEPARATELY.



SPEAKER - Add left and right speakers for more coverage Y - jack allows up to 4 dual module speakers



MIC INPUTS - Dynamic, wireless or condenser with volume control



LINE IN - Play music, run a LCD projector or computer



LINE OUT - Record your presentation while you speak

Contents:

Microphones	2	Maximizing Gain	6
Hand Held, Lavalier, Headset		Interference vs. Noise	7
Directional vs. Omni Directional		Other Noise Sources	
Dynamic, Condenser, Electret and Wireless		Indoor Installations	7
Speakers	3	Outdoor Installations	8
Cones vs. Horns		Sound Systems for Different Events	9
Amplifiers	4	Portable Wireless Sound Systems	9
Input and Output Connections, Output, Wattage, Distortion, Portability and Power		Summary	11
Setting up your System	6		
Feedback, Gain			

All public address systems (PA systems) have three basic components.

1. Microphones, 2. Speakers and 3. Amplifiers

Microphones

The microphone converts a sound source into electrical energy. In a presentation, that sound source happens to be you, the presenter! Microphones are relatively simple devices; however, there are a few factors to consider.

Handheld – Handheld mics are easy to pick up and use, they can be put down when you are done and they are easy to pack up at the end of your event. Unfortunately, they also keep you from using both hands and they are subject to some handling noise. People trained in microphone dynamics can be very effective with handhelds since the gain can be controlled and even the tonal quality of the sound varied by using the microphone in different ways. Many directional microphones exhibit a phenomenon known as the proximity effect. When the mic is held very close to the mouth, the bass response dramatically increases. While this is good for singers and comedians, proximity effects can work against the presenter. Even so, the handheld mic is a popular choice for many presenters.

Lavalier – This is a commonly used type of microphone. It clips on to the collar and is very small and very sensitive. They come in a wide array of styles and shapes. The lavalier mic leaves the presenters hands free and can be easily hidden under a lapel, if necessary. This makes these microphones popular with public speakers, motion picture production, television production, and church systems.

Headset – This type of mic is popular with auctioneers, aerobic instructors and broadcast announcers. The headset mic uses a boom to place the microphone very close to the lips. By doing this, the user can get more gain from the microphone and the background noise is lower. This mic is the best bet for hands free public address usage such as auctioneering, coaching, announcing or aerobic instruction.

Around the neck mics – Many people will purchase a headset mic and wear it around their neck for comfort, while this may be more comfortable, there is a trade-off. Very few people keep their heads in one position while they speak, causing the mouth to constantly change distance from the microphone. Because the mouth is 1-2 inches from the mic in the closest position and several inches away when the head is turned to one side, the volume level rises and falls more dramatically. This can distract from the presentation. This is why you never see broadcast professionals use a headset mic in this way. If the comfort factor is important then careful attention to how you move may make the trade off worth it.

After deciding whether to hold or wear the microphone, the next step is selecting the pickup system.

Directional vs. Omni-Directional

All microphones have what is known as a pickup pattern. The pickup pattern is how the microphone “hears” sound. The pickup pattern can have a dramatic effect on the PA system, affected both intelligibility, (how understandable the speech is to the listener) and gain (how much amplification you can get from the system).

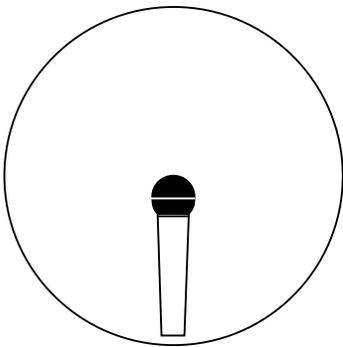
OMNI-DIRECTIONAL MICROPHONES

Omni-directional microphones pick up sound from all directions. Sounds coming from almost any direction will be picked up by the microphone. Generally speaking, omni-directional microphones have a “flat” frequency response – they sound very normal, and they are resistant to wind and handling noise. However, they can add feedback problems to indoor settings, something we’ll discuss later in this manual. Most headset microphones are omni-directional since they are so close to the mouth they have enough gain to avoid the feedback problems an omni-directional handheld would exhibit.

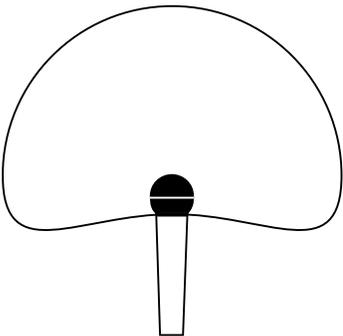
DIRECTIONAL MICROPHONES

Also called cardioid microphones, these mics tend to pick up sound from only one general

Directional vs. Omni-Directional



The microphone picks up sound from all directions.



The Cardioid microphone picks up the sound more from the front than the sides and back of the mic. The pattern is heart shaped, hence the name “cardioid.”

direction. They help avoid feedback and interfering noises that many come from the rear and sides of the microphone. For example, at a livestock auction, a directional mic may help prevent the animals from “mooring” over the PA. Cardioid mics tend to sound higher pitched and need bigger windscreens to prevent wind noise.

Microphones are built with different sensing components called elements. The three most common are the dynamic, condenser and electret.

DYNAMIC MICROPHONES

The dynamic mic is the simplest of all. In effect, it is very much like a speaker. Because of their simplified construction, they are durable, reliable and inexpensive. However, they are generally not as sensitive as the other types of elements.

CONDENSER MICROPHONES

Condenser mics use a different construction involving a charged diaphragm vibrating near a charged plate. They are much more sensitive because their internal parts are lighter in weight. Since these parts are lighter, they can be moved around by sound more easily. The charged parts require power, however, so the amplifier must provide “phantom” power. Phantom power is provided by applying voltage to the microphone through the cable. Most condenser mics require anywhere from 9V to 48V. This can restrict usage to wired operation only on some models. Their other drawback is lower durability. The higher sensitivity of these mics makes it much easier to get more amplification from a lower sound level source.

ELECTRET MICROPHONES

Electret mics are a modified version of condenser mics. Instead of charging the diaphragm, they have a permanently charged plastic film diaphragm. Now only the other surface requires phantom power. Many require only 1.5V of power to work. Since the film is extremely light, these can be very sensitive. Advantages include good durability, very high sensitivity, extremely compact size and low power requirements, for example lavalier (tie-clip) microphones are electrets.

WIRELESS MICROPHONES

Wireless mics are available in all of the variations discussed above. Basically, two additional components are added to the microphone, a transmitter and receiver. The transmitter translates the signal from the microphone into a radio signal. That signal is picked up by the receiver, translated back into an audio signal and sent into the amplifier. Eliminating the wire also eliminates the restrictions a microphone cable places on your ability to move about during the presentation.

Speakers

Now that you have picked up a microphone, you need to amplify the signal. The power amplifier is the next component in the system. The first question every presenter asks is “How Many Watts Do I Need?” Before that question can be answered, you need to decide what type of speakers you will be using. So let’s look at speakers first. For PA purposes, there are two basic types of speakers, Cones and Horns.

CONES

FULL RANGE SPEAKERS

The first is the cone speaker. This is the variety you will find in home stereos, cars and large speaker columns. The cone type of speaker has a wide frequency response which can give your voice a very natural amplification. Excellent for indoor use or small groups, the cone speaker will have some drawbacks outdoors with large crowds.

Important considerations for cone speakers; First, they are not very efficient. To get abundant amplification outdoors or to cover large crowds, you will need large speakers driven by powerful amplifiers. These components are built fairly heavy in order to handle these power loads. Second, they are typically built of materials that are not designated for outdoor use. Constant exposure to the elements may result in premature failure. Full range systems

Wireless Mic Set-Up



Microphones

Belt Pack
Transmitter



Receiver with antenna



S1294-70 Speaker

designed for outdoor use are even more expensive. Additionally, the quality of audio will actually become muddy at a distance. This is because the lower frequencies (bass) travel further than the higher frequencies. Ever walk into a party or concert and all you can hear is the bass at first until you get close enough?

Eventually, all you can hear at a distance is the bass. This will actually reduce the intelligibility for someone listening at the back of a crowd. Cone type PA speakers come in several configurations. The simplest is the single speaker in a box known as a full range speaker. The full range speaker will reproduce a fairly wide speaker response. The full range speaker, however, isn't designed, however isn't designed for high power levels.

CO-AXIAL AND TRI-AXIAL

Another common type of speaker are those which have different elements built into the same cabinet, each element designed to handle a separate part of the audio spectrum.

For example, a co-axial speaker contains a circuit (crossover) which splits the audio signal into two separate signals, one for the lower bass frequencies and one for the higher frequencies. The bass signal goes to a large diameter speaker commonly called a woofer while the higher frequencies go to a smaller speaker. A tri-axial speaker will contain crossovers which will split the signal into bass, mid-range and treble. Three different types of speakers will be incorporated into the same cabinet.

Speakers with crossovers will give a clearer, cleaner sound. They will also require more wattage for the same sound levels and will generally be much larger and bulkier.



S602 Megaphone

HORNS

The horn type of speaker has been popular for outdoor PA use for decades. The typical horn is usually made of metal or polymers and can withstand the elements better than the cone type speaker. They are far more efficient, which means more sound volume at lower wattage. By lowering the power demands made by the speakers, you can reduce both the size and the power requirements of your amplifier.

Horn speakers can best be described as "bright" in their sound. The higher frequencies are reproduced very clearly with virtually no bass. The limited frequency response is one reason they are so efficient. They don't waste energy reproducing the bass frequencies. Outdoors, the tinny sound is not very apparent. The speakers can also project farther without getting "muddy." The end result is better intelligibility at longer distances.

A very important point here is that horn speakers typically found in outdoor PA systems are incapable of producing bass. Therefore, a tone control on the amplifier doesn't accomplish anything except send amplifier energy into never-never land.

The horn speaker is recommended for large groups indoors or outdoors, where intelligibility is important over greater distances. This is why you see horns on nearly all car top units, portable PA's and in large auditoriums. As an announcer, it is far more important that your customers hear what you say clearly.



Horn - SW610 Half-Mile Hailer

Amplifiers

Input and Output Connections, (Jacks)

First are there enough microphone inputs for your purposes? Generally speaking 2-4 microphones are all most presentations will need. Too many microphones will restrict your ability to amplify. Every time you double the number of active microphones, you lower the maximum level of amplification.

Are the inputs compatible with the microphones? All of our microphones are compatible with our amplifier inputs so you don't need to worry about compatibility. Does the amplifier provide phantom power if your microphones require it?

Are there line level inputs? Line level inputs accept higher input levels from equipment such as tape recorders, CD players or other audio gear. This may be important if you want to play back recordings through the PA system. Some presenters will use this to entertain people before the event.

Are there line level outputs? Your tape recorder will give you better recordings if you can record directly from your sound system. You can damage equipment if you try to record from the speaker outputs because the voltage will be quite a bit higher than the recorder input is designed for. Our Amplifiers have a line out to record your presentation while it is happening.

OUTPUT

The output of the amplifier is described by the wattage output and the distortion. These are also the more important rating of the system. The wattage is going to determine ultimately how loud you can get your system. This is also the rating that gets kicked around a lot in the specifications. Below are a few specifications and how they should be interpreted.

WATTAGE

This is the power output. This specification should tell you the power level in Watts (RMS). RMS means "Root Mean Square." Basically, it gives a more realistic rating of the amplifier's continuous output. Peak power will tell the maximum output the system can generate for a short time, but this figure won't tell you how well it will perform for long periods of time. RMS power may be also noted on the specifications as continuous power. A properly listed power rating will tell you the output in watts RMS into a resistance measured in ohms. Most PA speakers are 8ohm.

DISTORTION

This specification is an indication of the amount of distortion you can expect. The lower this number, the better the sound should be. For nearly all good amplifiers for PA purposes, this number should be lower than 1%. For example, a 50Watt RMS amplifier into 8Ohms has a distortion level less than 1%.

PORTABILITY AND POWER

Avoid Overkill. Buying a system larger than you need is costly. The more efficient your system the better off you will be.

If you are buying a system that will be permanent, purchasing a system made up of separate components and installing them may be of benefit. Be sure to install good security features to keep the equipment safe when it is not in use.

There are many good portable PA systems available on the market which will give you good coverage and plenty of power. These systems are built with the microphone, amplifier and speaker already matched up. The advantage is reduced set up time, just plug and play. In addition these systems can be stored in a locked area when not in use.

There are a few important factors to consider when purchasing a portable system. If it is a portable battery powered PA, check the batteries will last all day at full volume. Battery capacity is measured in amp-hours (AH). Batteries that are rated for 8AH are going to last longer than batteries rated 3.2AH.

Be careful of systems that don't tell you the actual output of the amplifier. Some products may be advertised telling you the capacity in the speaker or speakers included with the unit as a system. This will tell you about the speaker, not about the amplifier. It would be like advertising a car that has tires capable of driving 300mph, but they don't tell you that the car can only travel 25 mph.

Talk to others in your industry about their portable PA system. Call the company you are researching for references. Make sure that you get a warranty in writing. We offer a 6 year warranty on our Portable PA systems.



S805A Amplifier
SW805A Wireless Amplifier

Setting Up Your System

Feedback

Feedback results when the amplified sound hits the microphone at nearly the same volume as the source. You are generating a sound wave which is picked up by the microphone, amplified by the sound system, picked up again and amplified more by the sound system and so on. It is characterized by howling from the speaker or a ringing noise.

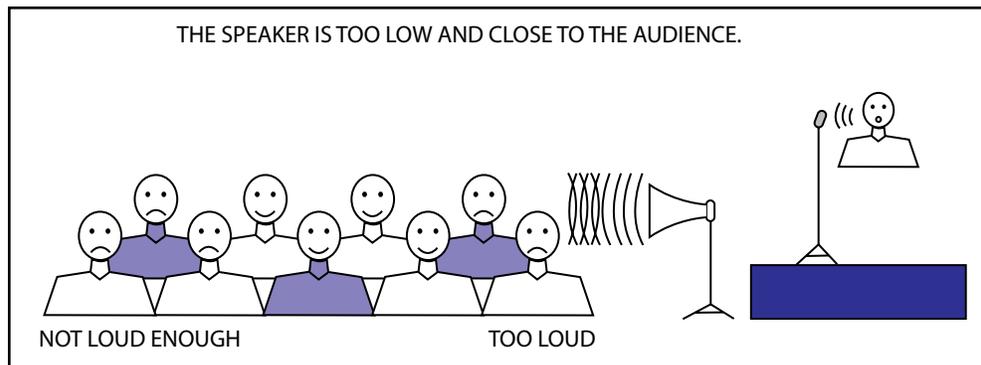
The easy cure for feedback is to turn down the volume. The feedback goes away but now everyone can't hear what you are saying. The better approach is to set up the system so feedback is prevented in the first place. What you are trying to do is get more gain from the system.

Gain is the difference (in sound level) between the original source and the amplified signal. For example, an audience member is sitting 35 feet from you. You are speaking without an amplifier. The audience member hears the sound at 65dB. When the system is turned on, you are heard at 77dB. 77 minus 65 is 12. That is a gain of 12dB.

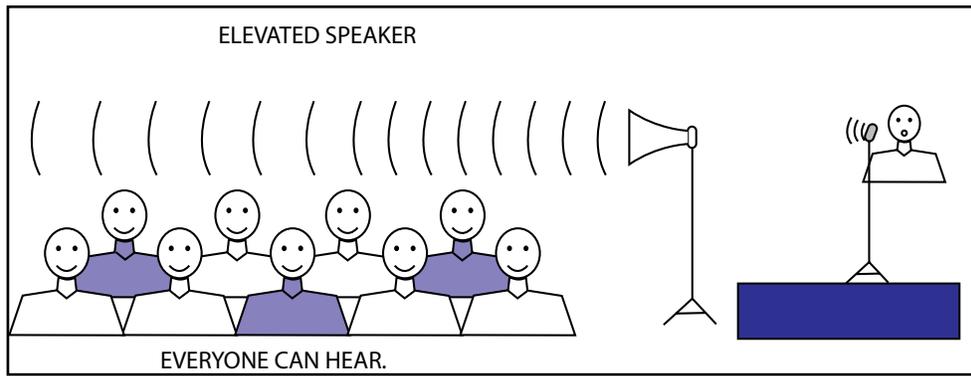
A decibel is a measure of sound that is based on proportional measurements and is logarithmic in nature. To get 3dB more gain is equal to doubling the sound level. Although 12dB doesn't sound like much of an increase, it is 16 times louder. The whole idea is to get as much gain from the system as possible without feedback.

Maximizing Gain

1. Decrease the distance between you and the microphone. Adjust the input level for the microphone so that the mic picks up your voice and not the background noise.
2. Increase the distance between the microphone and the speakers. The speakers shouldn't be very close to the microphone, but don't get too carried away with this. If the speaker is too far away, you will get an echo effect or lose effective volume for the audience.
3. Point the speakers towards the crowd, not you.
4. Try to direct the sound over the heads of your audience. Reflections off the front of the crowd can actually increase the chance of feedback. Furthermore, the sound is blocked by the people in the front row. They are getting blasted by sound and the people in the back can't hear at all.



This speaker is too low and close to the microphone and the presenter is too far from the microphone. The audience in back can't hear. The front row is going deaf and the whole system is about to feedback because the mic is too close to the speaker.



This is a big improvement. The speaker is elevated so the sound can pass overhead and the microphone is set further back. The auctioneer is closer to his microphone than in the previous example. The result is that the sound is actually set lower, so the front row isn't getting drowned in sound. Everyone is much happier and it makes for a better presentation.

5. Use directional microphones. If your sound system doesn't have too much bass, then a cardioid microphone will definitely increase gain. Here is another case where too much bass in the system will be counter productive. Bass speakers radiate their sound in all directions, you can get feedback sooner from a system with a lot of bass, even if the speaker is pointed away from you.

Interference vs. Noise

Two other common problems are interference and noise. If you are getting a constant hum from your AC powered sound system, the cause could be what is known as ground loop. It is caused by improperly grounded components in the sound system. It is characterized by a low pitched hum. To get rid of it requires that you carefully make sure all the components of the system are properly grounded. This problem can be avoided by using DC powered system such as a portable car top unit.

Other causes of noise are introduced by using long cable runs between speakers and amplifiers and between microphones and amplifiers. The cables can act as antennas and get local radio stations, CB and other radio frequency (RF) noise. If your system is going to require over 100 ft. of cable, be sure to use balanced cables.

Balanced cables feature three leads. The outer shield is braided wire surrounding the internal wires and forms the ground. There are two wires inside that carry the + and - of the audio signal. The outer wire shields the audio lines from interference originating from the RF sources.

OTHER NOISE SOURCES

Background Noise - is caused by your microphone picking up the sounds around you. You have the mic set to high or too "hot". Turn down the mic level so these sources of audio aren't picked up by the mic.

Wind Noise - The wind is a constant source of irritation for announcers and outdoor presenters. Use a foam windscreen to reduce this problem. It will also reduce popping from having the mouth too close to the microphone. If the wind is still a problem, use a larger wind screen or reduce the mic level slightly. Try to block the wind with your body.

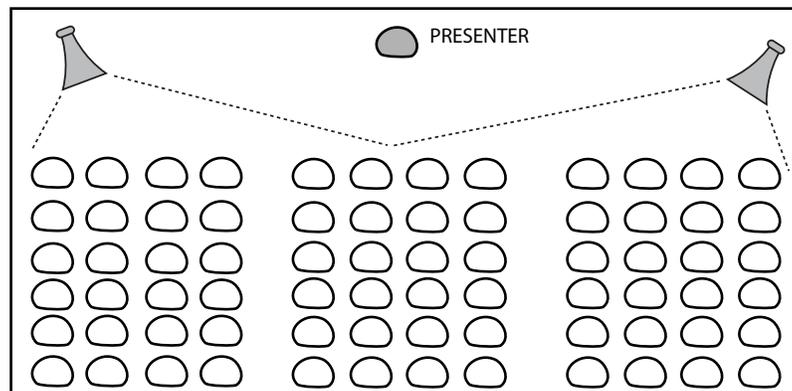
Indoor Installations

Rules to follow for successful indoor audio.

1. Don't set up too many speakers. This will cause echoes, dead spots and oddball reflections. Remember, the presenter is not a stereo sound source. Use only enough speakers to cover the area. Be aware of the coverage with just one speaker. Aim the speakers to cover the crowd without too much overlap. This is very important as the size of the area increases.

2. Use full range speakers for small groups, horns for larger auditoriums. Remember that too much bass will cause a great deal of “boominess” towards the back of the room. That’s great for rock and roll but will be counter-productive where you are trying to sell fine antiques.
3. Elevate the speakers if possible. This will stop the feedback from reflected sound bouncing off the front row and help the folks in the back row hear better.
4. Ring out the system before your event – turn on our sound systems and find out how high you can turn your system with all microphones on (open) before feedback. Turn up the volume while talking until you start hearing a faint ringing sound. Back off the volume a bit and mark that spot on the control. Then, when the event starts, you know where the maximum point is. Remember that the presence of the crowd can affect the actual final point. If you know the limits before you start, the better off you will be.
5. Don’t try to use too many microphones. Every time you double the number of open microphones in the system, you will have to reduce your amplification by 3dB (half as loud as before). For most events 2-3 microphones should be all you need active at any time.
6. Finally, you may have enough gain in the system to be too loud. Remember that hearing comfort is extremely important to your bidders. If your system is too loud, they may leave before the end of the event just to get a break from your PA.

The following illustration shows you an actual room where the systems have been set up for maximum gain. This set up will work in rooms that seat up to several hundred people. In larger indoor spaces, such as warehouses, you can have problems with time delays and echoes similar to those described in the next section, outdoor installations.



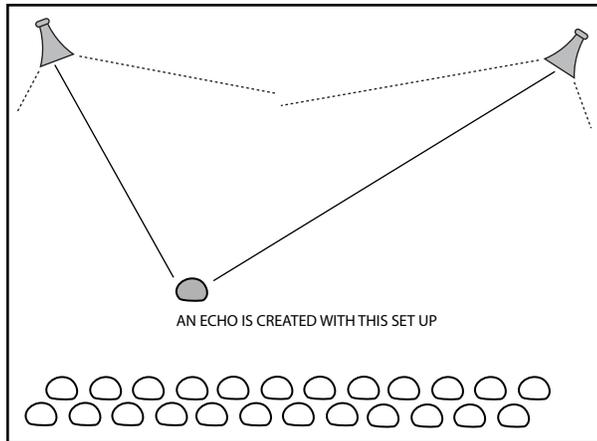
Outdoor Installations

1. Keep the microphone as close as possible to the presenter.
2. Set the speakers away from you. Don’t put them too far away or you will get long delays where you say something and the sound is heard ½ to 2 seconds later. Working in an echo chamber is no fun and confusing to the crowd.
3. Keep the speakers as close together as possible. Remember that sound only travels around 1,100 feet per second. If you place your speakers too far apart an echo will result. Ideally the speakers will be right next to each other pointed in different directions where they can be heard anywhere. Each speaker should cover its own unique territory.

For example, you have your speakers placed about 225 feet apart. Your customer is standing close to the first speaker. He will hear what you say immediately from the first speaker, but the sound from the second speaker, 225 feet away, won’t get to him until ¼ second later. He hears a confusing and annoying echo. Since he can’t understand the presentation, you have lost your customer and a potential sale.

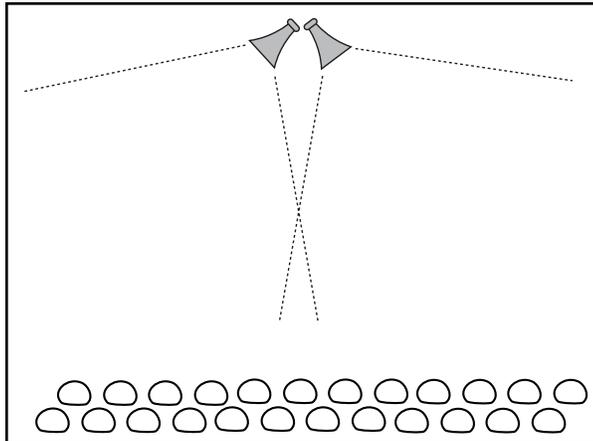
A BAD SETUP

In this set up the speakers are so far apart that the sound is getting to the audience at two separate times. They get a confusing echo about four tenths of a second apart.



A GOOD SETUP

By placing the speakers together, the confusing echo is gone and the speaker can be heard more clearly. The audience can follow the presentation.



4. Watch which way the wind is blowing. It can blow sound around and interfere just as well as hats, litter and certain species of small dogs. Take advantage of this if you can by pacing speakers upwind if it looks like a windy day.

Sound Systems for different presentations

Each sound system has its own special features. You have to consider several factors when picking the right sound system for your type of presentation. Size of the crowd, location (inside or outside), background noise that could distract your listeners and your need for mobility will all influence the choice you make. Sometimes, a combination of different sound systems will work best.

Portable Wireless Sound Systems

Some things to look for in a Wireless Portable PA System.

Does the belt pack transmitter have an external antenna?

All transmitters need an antenna to work. Some models have an antenna that hangs from the bottom of the transmitter. Antennas like that can easily be damaged simply by sitting on them.

Do the specifications give you amplifier output?

Be very careful of systems that don't tell you the actual output or true power of the amplifier. Some products may advertise the maximum power handling capability of the speaker included with the unit (which doesn't tell you anything about how loud the system will be.) It would be like advertising a car that has tires capable of going 300 mph when the car can only go 25 mph. Look for a spec that gives you the true amplifier output power. It is even better if the specs list the maximum sound pressure level (SPL), that the system can produce.

Is the system manufactured by more than one company?

AmpliVox builds and services all our units in our factory in Northbrook, Illinois. If you need your unit repaired you only have one

Is the equipment manufactured in the USA?

When it comes to service, there's nothing better than dealing directly with the factory.

How long is the warranty and what does it cover?

Ask to see a copy of the warranty before you buy. Many companies have limited 1 year warranties on certain parts of their equipment. AmpliVox offers a 6 year warranty!

<p style="text-align: center;">LIMITED 6-YEAR WARRANTY</p> <p>We warrant to the original purchaser the AmpliVox product packed with this certificate to be free from defects in material and workmanship under normal use and service, and we will, within six years from date of purchase, repair or replace at our option, without cost to the owner, any part, assembly, or portion thereof, which our examination shall disclose to our satisfaction to be defective. This warranty does not apply to a unit which has been subject to alteration, accident, misuse, battery leakage, abuse, floods, or fire. Note: This warranty covers the repair or replacement of defective parts only, received at our factory or authorized service station, and does not in any way imply that the manufacturer will absorb field repairs and/or field labor costs.</p> <p>This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products. In no event shall the manufacturer be liable for damages for a breach of warranty in an amount exceeding the purchase price of the alleged defective equipment.</p> <p>Procedure: Call 1-800-267-5486. If factory adjustment is required, the equipment should be positively identified with your name and address on an attached tag or sticker. Pack carefully in an adequate shipping carton, send per instructions to the factory address shown, with description of the defect.</p>

Does the unit have a continuous battery charging status light?

When you plug in the battery charger, you need to know if the batteries are taking a charge and how long to leave the charger plugged in. The battery light must be part of the charging circuit to show what's actually going on. "Push to test" switches may or may not be part of the battery circuit.

What is the battery amperage on the base of the unit?

The battery should be powerful enough to run your unit all day at full power. A 6 amp hour battery pack would work well, but a 7 amp battery pack would work better.

Heavy duty rechargeable NiCad power pack for all AmpliVox 50 watt multimedia amp equipped sound systems - requires S1460 AC Adapter/Recharger, which recharges the power pack without have to remove it from the amplifier. Our 100 watt Travel Audio Pro Set of two 12 volt, 7 amp-hour sealed lead acid replacement batteries for all Travel Audio Pro battery-powered models.

How easy or economical is it to add on to this system?

Verify what the "add-on" wireless package consists of (transmitter, receiver, mic). Be sure to ask about this before you're ready to add speakers or a second channel onto your system so that you're not surprised by price later. All of our products and their prices are listed on our price sheet and on our web site. You are never surprised by our up front pricing. Our staff is happy to help you configure your system and plan for additional equipment.

Summary

When selecting a PA system, remember that it is vital that the sound system will allow you to communicate clearly with your audience. Clarity and the ability to cover your entire crowd are the important function of the sound system. A good PA system will allow you to speak in a normal conversational voice.

Select your system according to the type of microphone you are comfortable with, the types of presentations you normally give and the size of crowd you deal with. Buy as much system as you will need but be sure it will be adequate for your largest crowds.

Remember to centralize your speakers. Keep the mic as close as possible to your mouth and as far as possible from the speakers. Try to project the sound of the system over the heads of the crowd.

