

Technology

How to Choose a PA System for Your Marching Program

By Brian Stith



Band directors need to communicate with their students on the field, in the stands, and sometimes even in the rehearsal hall. With a variety of systems available, it's best to understand the benefits and limitations of each system before purchasing one.

What are the different types of systems?

There are 2 types of portable systems: a re-entrant horn system and a full-range system. A re-entrant horn system is a 4-month system designed to communicate with the students on the field from July through October. It's small, lightweight, and less expensive, limited to voice and a metronome. A full-range system (horn and woofer) is a 12-month system which will do everything a re-entrant horn system will do. It can be used at performances in place of (or in addition to) a large sound system. The system can be used inside rehearsal halls to listen to recordings.

Are there different types of batteries used in systems?

Lead Acid Battery: Most systems offer a standard lead-acid battery like a motorcycle battery. The pros are that it is an inexpensive battery. The cons are the battery is heavy (typically 7-10 pounds), last for approx. 150 charging cycles (1 to 2 years of normal usage), and if left on the shelf unplugged for a few months in storage, the battery could die.

Lithium Iron Phosphate (LFP): Sound Projections offers the LFP battery in both the SM-5 and VM-2 system. The pros are that the battery is lightweight (2-4 pounds), last for approx. 2,000 charges (10 times the lead acid), and if left unplugged for a year, the battery simply needs to be charged. The con is that it is more expensive battery than the lead acid.

How loud does the system get?

The correct question to ask is, "How many decibels does it produce?" In human hearing, a 10db increase is perceived as being twice as loud. For example, 90db is twice as loud as 80db. A sound system should be at least 10db louder than the competing sound. A 100+ piece high school marching band plays at approximately 110db, so the sound system should have a db output of at least 120db to easily compete. If the sound system is rated below 120db, it could be difficult for the students to hear the director.

Clarity of the system:

Just because an 18" sub-woofer puts out 120db does not mean one can understand what is being said. It will have great bass, but no clarity in the vocal range. Americans listen to consonants, which are in the upper frequency range of our hearing. A sound system should produce clear sound in that range. The portable system should have a real "horn driver," not a tweeter, and preferably be bi-amped (2 amps - 1 for horn, 1 for full range speaker). Having an electronic crossover to separate the frequencies, and an independent amplifier just for the horn, will give clean/clear sound over a large outdoor area such as a football field.

Wireless systems:

There are numerous considerations when looking at the wireless system in the portable unit, but when it comes down to it, there are three that are very important.

Type of antenna on the receiver: Receivers will have either internal or external antennas. Internal antennas have a range of about 150', while external antennas have a range of at least 350' in an open environment. Interference from instruments and the number of students between the transmitter and receiver could cause the transmission distance to be cut in half. A director using an internal antenna could have signal dropout less than 100' from the unit. External antennas allow the band director to be at least 200' away from the system without dropout.

Wireless frequency and agility: Most wireless systems transmit on UHF frequencies. HDTV stations also transmit on UHF frequencies. The problem is if the wireless receiver is on the same frequency as the local HDTV station, you may experience interference when the wireless microphone transmitter is only 30 feet away from the unit. Having a multi-channel wireless system that covers a minimum of 5 congruent TV stations (i.e. TV stations 21-25) is one way to protect against HDTV.

Wireless digital display: Because of the need to change channels quickly due to outside interference, the wireless receiver should have a digital display to let the band director know exactly which channel he is on, and what channel he needs to program in the transmitter. Having a system that auto-scans the area for the best frequency is also a major benefit.

Where is the system built?

The sound system is one of the most important investments. A band director/school that is using a system daily should purchase a professional system. A professional system can cost a few thousand dollars. This is an investment that should last for many years; however, sometimes things happen and parts break, so being able to repair the system quickly is just as important as the initial investment. Purchasing an American-made system should be a high priority.

What should a minimum warranty be?

A system should have a minimum of a 2 year "bumper to bumper" warranty on all parts against manufacture's defect. Anything less than that, and a band director/school runs the risk of spending more money in a short period of time.

Does the company repair the system after the warranty expires?

Different manufacturers have different repair policies. Some manufacturers will repair the system, after the warranty expires for a fee. Other manufacturers will not accept a system for repair once the warranty expires. The manufacturer should be easily available for technical support and be able to answer questions over the phone. If the system needs to be repaired, the manufacturer should be able to fix and return the product in a timely manner.