



# *TDF's Guide to Sound Systems for Dressage Clinics and Musical Freestyle Events*

Every year, TDF receives numerous evaluations from groups that have hosted a clinic, symposium, or other dressage related educational events supported by a TDF grant. Countless times, the reviews are amazing, but there is one common complaint amongst the auditors and riders- *hearing the instructor*. We've gathered some information that we think can help you as you prepare your next event.

Chapter One : What is a PA System?

Chapter Two: PA System Requirements for Different Venues

Chapter Three: Music Amplification for Freestyle Events

Chapter Four: Types of Systems



## Chapter One: What is a PA System?

A public address system, or PA system, consists of three basic components to effectively convey sound to an audience:

1. **Microphone:** A microphone acts as the pick-up device, converting sound waves from voices or instruments into electronic signals.
2. **Amplifier:** The signals from the microphone go through an amplifier for processing and are then converted.
3. **Speaker:** After the signals from the microphone are processed through the amplifier, they are converted by the speaker to be heard at a reasonable volume without distortion at the location of the speakers.

There is much more to a PA system than the basic elements. In the next chapter, we will review what kind of system you need for your event.

## Chapter Two: PA System Requirements for Different Venues

There are many different formats in which clinics are hosted. Small, intimate venues like viewing rooms, offices, or community centers will have different requirements to a large indoor arena, as well as a large outdoor arena. Just as the size of the venue will determine the components of a PA system, so too does the type of sound transmission. Instructor's commands will require different treatment to musical pieces while practicing freestyle clinics.

And we all know as riders and auditors, it can be difficult or even impossible to hear when the wind is blowing, people are chatting, or while your horse is working. As an instructor, the last thing you want to do is to lose your voice from a clinic! In this chapter, we will discuss the types of PA Systems for different venues and audiences.

There is a direct correlation between venue size and power requirements. Manufacturers may differ in the descriptions of the size of the system regarding the wattage, but it is fair to call systems under 30 Watts as mini PA Systems, 30-50 Watts as small PA Systems, 50-150 Watts as medium PA Systems, and above 150 Watts as large PA Systems.

### **Indoor Systems**

Indoors, the enclosed cubic volume is important when assessing the right size of PA system for the venue. A high ceilinged indoor arena has more space to fill with sound and requires a system with greater power and amplification to do so.

The acoustics also determine the system requirements. Some places with heavy insulation and many auditors will absorb more sound rather than bounce it. It is important to have sufficient capability in the PA system to cope with extra amplification and volume from the components at the turn of a dial.

### **Outdoor Systems**

Outdoors where noise drifts, wind is blowing and the noise of the barn is filling the air, there is little opportunity for bounced sound. In the absence of audio reflection, more volume is required, and thus, more power.



## Chapter Three: Music Amplification for Freestyle Events

By Michael Matson – TDF's Dancing Horse Fund

A clinic might include mostly verbal instruction from the instructor, but what about musical freestyle clinics or shows? Or ambience between rides or during breaks? A PA system needs greater amplification and wattage for music because of the different frequencies that instruments deliver. They are usually higher and lower than speech patterns and as such, require a system which is sensitive enough to cope with the range in spectrum.

Here are some of the components of a PA system that go into a musical freestyle event.

### **Stereo Receiver**

- **Power:** In a two-speaker system 80-100 watts per channel at 8 ohms is desirable at minimum for a very large space such as an arena.
- **Distortion:** Total Harmonic Distortion (THD) is the most audible form of a receiver's distortion. Look for a THD specification of 0.1% or lower.
- **Other Features:**
  - **Loudness contour:** Contour compensates for the human ear's lack of sensitivity to bass frequencies at low volumes.
  - **Digital sound processing:** This feature allows the music to be reproduced so that it sounds like you are hearing it in a concert hall, small club, cathedral, etc. Look for Dolby or THX.
  - **Remote control:** Required equipment when mounted unless you can access your system from horseback, makes managing the sound from afar easier.
  - **Auxiliary Cable:** You can buy an auxiliary cable to hook your iPod, phone or mp3 player into your stereo receiver. This will allow you to play your music through the stereo system. The connectors can be found at most electronic stores such as Radio Shack, or even Target or Walmart.

## **CD Player**

Buy a multi-disc CD player. There are two systems of loading discs into a multi-disc CD player – carousel or magazine. The carousel system is easier to user, more flexible, and somewhat more reliable than the magazine.

The CD player should have programming features that allow you to select which discs and tracks you want to play and in the order you want. It should also have a repeat feature allowing you to replay your programming.

## **Speakers**

Buy outdoor speakers! Dust, moisture, and temperature fluctuations can harm most speakers. Outdoor speakers are designed for environmental extremes. I highly recommend the BOSE series of outdoor speakers.

Check the technical specifications of the speakers to make they can handle the power output from the receiver.

The only way to find out how speakers will sound in an arena is to try them out there. Buy only from a store or vendor that will let you try out speakers and return them without obligation if you are not satisfied.

Two speakers should be adequate for an arena and they should both be positioned on one of the long sides. Outdoor speakers usually come with wall mounting brackets. If not, you can purchase them. Do not align speakers directly across from each other. You may have to adjust the position and direction of the speakers to optimize acoustic performance in the arena.

The type of speaker wire you need depends on the distance you are setting your speakers from the stereo receiver. Use 18 gauge wire if each of your speakers will be a maximum of 30 feet from the receiver, 16 gauge if the maximum distance is 45 feet, and 14 gauge if the maximum distance is 70 feet. Longer distances require heavier gauge and any electronics store (e.g., Radio Shack) can tell you what is needed. Place your speaker wire so people or horses cannot contact it.

## **Storage**

You will need to locate the stereo receiver and CD player so moisture, rain, and dust cannot harm it. You can build or buy a box with a hinged plexiglass cover and holes for the electrical plugs and speaker wires. Locate the box such that you can either reach it from horseback or so that it can be accessed via remote control. If possible, buy extended warranties for the stereo receiver and CD player that cover any environmental damage.



## Chapter Four: Types of Systems

### Portable PA Systems

For clinics and symposiums offered in a variety of venues, the PA system needs to travel. Even in a show arena where there might be a permanent set-up, there are occasions when the system needs to be located elsewhere. Weather changes during outdoor events, last minute venue changes are examples where portability is an issue. For instructors, fitting a PA system onto your carry-on bag in the airport may be very important.

- *Audience size and wattage:* In an ideal environment without too many variables, audience size determines power requirements. Usually sound technicians operate on a ratio of 1:1 (Watt to person). In a venue with an expected capacity of 120 in the audience, as portable PA systems usually have stereo speakers, the two channels will require 60 Watts each to match the optimum listening experience.
  - Fitting the system to the type also involves numbers. The amount of input and output channels need to accommodate the number of microphones, speakers, DVD/CD devices and auxiliary devices used.
  - The issue of microphone portability may be addressed through the use of wireless technology for hand held, headband, collar, or lapel mics with RF transmitters. Their receivers require plugging into the PA amplifier. For most instructors and rider, wireless mics are preferred. To avoid interference, each wireless mic needs to have a separate operating frequency.

### Fixed Systems

Fixed PA systems, or custom built fitted configurations, ordinarily serve venues where they have regular use, such as show grounds. Competitors will want to hear everything clearly. As a fixed or permanent fixture, the benefits can be streamlining, concealment, and optimum positioning of speakers for the venue's acoustics. (See page 5.)

### Wireless Systems

Whether fixed or portable, there is the option of an independent, self-contained wireless function for PA systems' companion speakers. Board member Maryal Barnett shares, "I use the Equuscom WiWi System with a small portable speaker for clinics that have auditors. It works very well for me and is small enough to be packed in my carry on."