

## Audio Cables

The audio cable is a compact cable used in the audio recording and entertainment fields, that contains individually shielded pair microphone cables all housed by one common outer jacket. The inner microphone cables are each pair of insulated, twisted –pair, multi-strand wires, surrounded by shielding made of foil or tightly braided wire mesh. The cable may be plenum rated making it strong but that makes it difficult to handle and roll. More expensive cables use finer wires and wire braid shield rather than foil and the outer jacket is soft, making it flexible and easy to roll. Cotton filler runs down the middle of the cable and helps it to maintain its shape. The cable is normally rolled over and over number of times in a manner such that when pulled out of the packer, it won't develop twists.

Different manufacturer of cable use different methods of identification for the shielded pairs of cable. As an example, one manufacturer Belden, have a sequenced color code and a number for each of the conductors in their products of up to 52 pairs of cable. For their plenum cables they use a French Braid. Many manufacturers mark number on the PVC insulation of the individual pairs.

### Composite multi-cores

Composite multi-cores cable combines different types of signals in the cable. They may contain coaxial cores for video, twisted pair for data or low voltage cores for mains power. Composite multi-cores are usually used to connect video cameras but they are gaining usage in live sound with the introduction of the Yamaha PM 1D which uses a composite multi-core cable to connect to the stage box.

### Audio Multi-core

The multi-core cable runs from the stage box or microphone splitter and then to the Front of the House sound desk or mixing console. Permanent installations have stage boxes mounted on the floor or side of the stage and the cable run through the roof or floor to the console, located either in the auditorium or bio box. For temporary shows, the stage box is placed at the side or rear of the stage and generally 75% of the connectors are female XLR with the balance male XLR. The male XLR are used as return to the stage for the on stage monitoring. Larger multi-core has male and female connectors for each channel at the stage box end giving it more flexibility. In this system the male XLRs may be used to give a split to the on stage monitoring. The onstage monitoring is connected by a cable with tails at both ends. The console end always has the opposite sex of XLR connector. Larger shows tend to use a system which plug into the main stage box so you can use shorter microphone leads on stage and can have better maneuverability on the stage.

High end Audio Cables are appreciated since it boost the sound quality of high-fidelity audio system. It is true that cables will have an influence on any signal transmitted, since the audio signal passes through cables as it flows from source to the amplifier and then from amplifier to speaker. Basic system frequency response can be computed based on electrical factors of the cables, and elements on both sides of the cables. These electrical factors are resistance, capacitance and inductance. These are the qualities that play decisive roles in the design of quality materials of the cable for commercial and broadcast purposes. The high end cable for the audiophile market often involve intricate construction features and may contain exotic materials such as silver and oxygen-free , long crystal, high purity copper.

## High end audio cable fracas

There are arguments that even the high end audio cable sometime makes mistakes in their quest for a superior sound effect. As an example, in a double blind test, it is almost difficult to differentiate between the astronomically priced speakers cables from ordinary lamp cords or 12AWG copper speaker wire.

## Digital cable

Digital cable design is not free from the melee. High end cables are available together with marketing claims of distortion free signal transfer, thus ushering in many arguments to the contrary. Those in favor of this insist that since digital data transfers involves data correction, then any cable that can transfer bits naturally produces distortion free signals. The bit rates (about 1MBit / sec.) and distance covered by these cables are significantly less compared to other data transfer technologies such as Ethernet. However, some people disapprove the above claim of distortion free signal transfer in digital cable. According to them, the timing signal is sent in analog form and if the wave is distorted by an incorrectly specified cable, the incoming bits may be mismatched to a time bin that may lead to distortion.

## The importance of cable in audio system

Many of the customers often raise the question that why so much importance is given about the audio and video system cable? Well! We all are aware that cable purchase can be an expensive or even more expensive than the price of any of the hardware purchased. To many user, audio becomes too complicated since it seems all cables are not made equally good and differs in performance.

Let us discuss how audio cable functions. There are two basic types of audio cables in the system. The first sort of cable is an interconnect, which is used to harmonize a variety of components (like a CD player to a receiver). The other type of audio cable is the loudspeaker cable, which is the wire from the amplifier to the speakers. It is to be noted that both the types

carry the same data but energy consumption is different. Interconnects bear a signal with minimal energy in it. These cables require an unremarkable stream of energy to send the information from the source, for example, a CD player to the amplifier. The low energy demand will indicate that the signal in interconnects have very low current requirement. It is the opposite in the case of loudspeaker cables, because these fields consume large amount of energy. All of the energy needed to transfer sound from the speaker cones through the cables to the loudspeaker. This explains the high energy needs in these cables and the relatively high current consumption, which normally is a minimum of 10 amps.

Audio cables have critical influence in communications because they can alter somehow the signal passing through them. Specifically, the cable itself may change the signal or the cable may permit outside interference to affect the signal.

### **How cable affects the audio system**

Interconnect cables bear an insignificant amount of current. As a percentage of the current, the voltage is quite high. As the voltage shifts from being positive and negative, the capacitance weighs the voltage's sifting, causing delays. This can lead to audible distortion in the sound. Since interconnects carry low current, resistance is not an important factor.

The loudspeaker cables are practically the opposite of that of interconnects. The loudspeaker cables the voltage is small but the current requirement is big. The high current makes both resistance and inductance necessary in loudspeaker cable. With greater resistance comes greater amount of energy that needs to be borne by the cable. The resistance will pull down the volume of the sound. Inductance on the other hand, is a reason for distortion. As the current swings from being positive and negative, the inductance pushes down any current changes, and causes distortion or disruption.