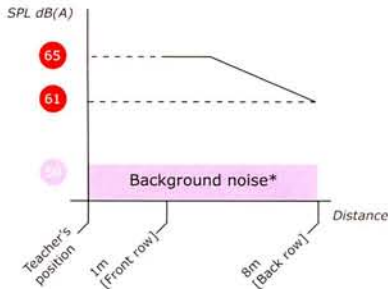


Playing the field

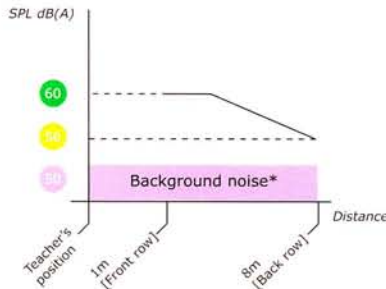
Away from the high profile video technologies, the other side of the AV coin is also starting to make an impression in the education markets of Europe and the Middle East. Newly introduced pieces of legislation such as the UK's Building Bulletin 93 and its European counterparts are laying down a set of requirements for the acoustic conditions in classrooms and other school environments.

Ambient noise in the classroom from shuffling chairs to chattering children, and exterior noise from passing traffic or adjacent classes means that teachers have to raise voices and children are distracted. One possible solution to this issue is the use of a Sound Field system.



classes, even for six hour of contract. However classroom noise can make communication difficult and a Sound Field system may help to lift the sound level of the teachers voice and distribute it evenly across the room. This can restore an adequate balance between that voice and the accumulation of interfering background noises.

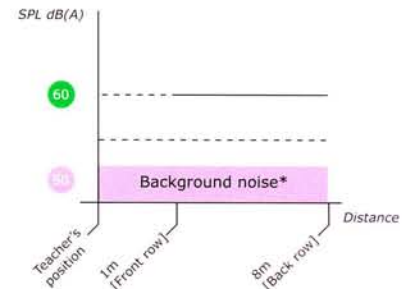
Like any other sound amplification system a Sound Field in it's most basic form consists of the source – commonly a radio mic for the teacher, amplifier and loud speakers. Speaker choice will be largely dependant on the logistics of the classroom. Older school buildings most likely have high, solid ceilings



of a suspended ceiling, which additionally would allow for the installation of ceiling speakers. Additionally, carpeted floors which will absorb sound rather than reflect like hard tiling can improve the situation.

The ability to communicate effectively within a classroom, as with any space, depends on a few basic elements – Reverberation time (RT), Signal to Noise Ratio (SN) and Sound Pressure Level (SPL). These three factors combine to produce Speech Intelligibility (ST) which is an objective measure accounting for all the acoustic variables in a room.

The effects of a Sound Field system, and acoustic treatments on ST are



The effects of acoustic treatments and Sound Fields on classroom sound levels.

But what is a Sound Field system? Simply put it's a sound amplification system. The term originally derived from Audiologists who are the scientists most frequently to be found studying the communication links between students and teachers via the speech and hearing process.

Traditionally they have employed two ways to test hearing. The first is via the use of headphones. The second is to use small speakers in a quiet environment and is referred to as the "Sound Field" method.

Under quiet conditions, most people have enough natural strength in their voices to communicate with and control groups the size of school

rendering them unsuited to ceiling mount loud speakers, whereas newly built schools will have cavity ceilings with removable tiles.

An active system however is only half the solution. The aim of a Sound Field system is to avoid an upward cycle of volume where teachers compete with an ever increasing level of sound. Therefore the ambient acoustics of a room should be considered. Acoustic insulation of a room prevents outside noise from getting in and, just as importantly, stops sound from inside the classroom interfering with adjacent rooms. In an old building this might include double glazing or the fitting

illustrated in the series of diagrams.

They clearly show that whilst acoustic treatments positively affect the SPL in a typical classroom and reduce it to an acceptable level the SPL degrades towards the back. The combination of Sound Field technologies, and acoustic treatments provides a lowering of the overall SPL as well as a uniformity across the whole space.

Architects are now required to take account of the acoustic properties of learning spaces and take action to "...provide acoustic conditions in schools that facilitate clear communications of speech between teacher and students..." 