

QS12 Where soundfield systems are used in conjunction with personal radio aids, equipment must be selected and set up to ensure that the performance of the personal radio aid system is not compromised.

This means that the soundfield system should effectively be acoustically transparent and not significantly alter the original radio aid signal.

In recent years many classrooms have been equipped with soundfield (or classroom amplification/ audio distribution systems). The teacher wears a microphone which transmits to an amplifier and speaker combination which spreads the teacher's voice around the class in an even "soundfield". The teacher then needs to use a normal speaking voice, reducing vocal strain and ensuring a more pleasant listening environment. The system should provide low level amplification and redistribute the voice so the seating position of any child relative to the teacher is less important.

Soundfield has been shown to be extremely beneficial for all children; for example children with English as an additional language, and not just children having special hearing or communication needs such as speech, language and communication difficulties; visual impairments; fluctuating hearing impairments caused by conductive hearing loss; attention deficit hyperactivity disorders (ADHD); an auditory processing disorder or difficulty; or being on the autistic spectrum.

Soundfield is not always a solution to classrooms with poor acoustics but the new generation of soundfield systems need little or no installation so can be trialed to ascertain the benefits. Acoustic conditions and sound insulation of

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learning spaces should be suitable and, where applicable, comply with Building Bulletin 93¹.

Soundfield can be used in conjunction with personal radio aids. However, a soundfield system on its own delivers a lower signal to noise ratio advantage than radio aids. So, a soundfield should not be considered as an alternative to providing a radio aid system. Having said that there are some children with hearing losses who may not have access to a radio aid, or decline to use one, and soundfield can give much needed assistance. Soundfield is considered as being inclusive as all children's listening and teacher's vocal health is helped. Also, the teacher wears a microphone for the benefit of all children. Soundfield usage in a class has been shown to lower the overall class noise level which will significantly assist a deaf child².

Soundfield can be divided into different groups although the overall aim is the same:

- (A) Infra-red (IR) or radio transmission from the teacher. Modern technology ensures we do not run out of radio frequencies whilst IR signals are contained within the classroom allowing soundfield usage in the largest of schools. Both transmission methods are stable, consistent and easy to use.
- (B) Single point systems (usually portable with speaker(s) and amplifier in the same housing) or a base station with remote speakers. More of the single point systems are now being used due to improved speaker technology and lower or no installation costs.
- (C) Most soundfield manufacturers link to radio aids by "rebroadcasting" whilst one manufacturer transmits

¹ BB93: Acoustic design of schools - performance standards
<https://www.gov.uk/government/publications/bb93-acoustic-design-of-schools-performance-standards>

² http://batodfoundation.org.uk/index.php?p=1_6_Research

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directly to the radio aid. Rebroadcasting involves plugging the radio aid transmitter into an output from the soundfield amplifier, meaning the teacher wears only the soundfield microphone. The radio aid user can receive through the system not just the teacher's voice but other voices via pass around microphones, and audio from the screen. It is essential that the soundfield has a line audio output (usually a jack socket). With this method it is required that the radio aid transmitter mic is muted (automatic with some manufacturers) otherwise excessive environmental noise may be heard. It is essential that rebroadcasting does not significantly alter the original radio aid signal. The output should be acoustically transparent and give a similar benefit to the radio aid; i.e. it should not make the radio aid signal too soft or too loud and checks should be done to ensure the combined system provides the desired advantage.

Soundfield systems are fast becoming a de facto audio hub for the class. It is important to ensure multiple line inputs are available for whiteboard audio, computer audio, CD or other recorded material including mobile phones and tablets. Some soundfield systems are positioned at the front of the class and some at the back for various reasons, those at the front are easily connected to audio sources via a cable or more recently Bluetooth, whilst those at the back may need a long low-noise cable or an optional "sender".

The various soundfield manufacturers have features that may be unique to their systems, these features include: digital feedback suppression, auto muting of all sources except the teachers microphone, battery powered, and the ability to record the lesson for future revisiting, revision or an absent student etc. All manufacturers offer a pass around student microphone which is likely to improve the overall listening experience for all students including children with a hearing loss. Some systems can also offer a number of student microphones which can be used around the classroom.

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It is also worth noting that although modern systems are technically very sophisticated, they are now easier to use than in the past and more reliable - often carrying long warranties. Additionally newer battery technology and charging techniques are proving advantageous.

We would recommend that prospective users trial soundfield systems before purchase and that they initially contact companies that are connected with hearing aids or radio aids to ensure competent support and a good understanding of hearing impairment. Examples of these companies are

- Connevans www.connevans.co.uk
- FrontRow www.gofrontrow.com
- PC Werth www.pcwerth.co.uk
- Phonak www.phonak.com/uk

These manufacturers all offer free trials with training and technical support. We would recommend that for more detailed technical specifications or assistance you contact the relevant manufacturer.