

## GUIDANCE NOTE

Diocesan Advisory Committee for the Care of  
Churches



## INSTALLING A SOUND SYSTEM

The primary purpose of the sound system in many churches is to improve intelligibility of the spoken word so that everyone present can hear and understand easily. In most churches, this will mean gently reinforcing the sound of the human voice so that listeners – wherever they may be in the church - can hear easily without straining. The congregations of all but the smallest church buildings can benefit from the installation of a sound system, which will be greatly appreciated – especially by those who only come to church occasionally. The system should be designed and balanced to produce sound which appears to come directly from the person speaking. (Note that if your church requires a sound system that will work well with a band or other group of instruments that requires amplification, specific advice should be sought from a specialist. Please contact the DAC office for further help.)

One of the most effective ways to improve audibility is to improve visibility. If you can see the speaker clearly you will almost inevitably seem to hear better, and certainly comprehend better. (Remember that the profoundly deaf may need to lip-read.) However, all churches need to make some provision for those who have a hearing loss.

There are two distinct, but interconnected systems. First, a loudspeaker system to improve intelligibility. This does not mean just increasing volume, rather directing sound at the listener. Not only does this benefit the congregation, it also allows people with quieter voices to take an active part in the spoken parts of the service.

Secondly, there is a loop system, which will benefit enormously those who have a hearing aid with a "T" switch. As much of the church as possible should be covered by the loop system, so as not to create 'no go' areas for the hard of hearing. More information about loop systems may be found at the end of this document.

### CHOOSING A SYSTEM

- It is vitally important to consider what you want from a sound system and what you expect it to do. Do you just want basic sound reinforcement with a loop, or do you want to be able to play music (eg CDs) through the system. Do you want facilities to be able to record services to take to those who are housebound? Do you have a band in church that will be using the system? Try to anticipate what your church's needs might be in the future and whether you need to plan a system which you can add to.
- Get quotations from at least two audio advisers/contractors, preferably with experience with installations in churches, which have specific needs compared with secular buildings. It might be helpful to visit a church with a similar system to that which you think appropriate in order to see what it is like and how easy or otherwise it is to use. The DAC Secretary can provide names of companies known to have carried out such work in the Diocese.

- Consult your architect about the appearance and siting of loudspeakers and the routing of cables.

**Speakers:** Modern speakers need not be unattractive, though they are the most visible, and therefore likely to be the aesthetically difficult, part of the system. They need to be located to provide the best acoustic performance, but also be as unobtrusive as possible. Their selection and siting is an important consideration. They should be tinted to match their background. The angled mounting of speakers on nave columns should be avoided. Speakers may be incorporated in lighting pendants or installed flush to ceilings.

**Mixer and Amplifier:** These are the heart of any sound system and may be separate or combined as one unit. The following points should be considered:

- How many inputs are required for microphones, both fixed and radio type, and other sound sources (eg CD players)? Consider what your needs are now and in the future. Aim for maximum flexibility for your system so that your sound system does not limit your liturgy and worship needs.
- What audio outputs are needed for speakers, loop equipment and recording etc?
- What size and how many amplifiers are required to drive the loudspeakers that will be required?

**Microphones:** The varied demands of worship may be met with fixed or radio microphones, or a mixture of both, and your audio adviser will be able to suggest appropriate microphones for your needs.

## FURTHER PRACTICAL POINTS TO BE CONSIDERED

**Cabling :** Although usually of small diameter, cable can have a detrimental affect on the appearance of the church if not sensibly routed and neatly installed. The employment of a capable electrician working in conjunction with the supplier of sound equipment may well result in a more satisfactory standard of cable installation. The routes of cables should be carefully planned so that they are unobtrusive, preferably concealed in roof and floor voids. Cables may be directly glue-fixed to walls provided this is agreed with the architect in advance. If small trunking must be used and it is within sight, then the trunking should be painted on completion to match the background décor. **It is important that all the equipment should be sympathetically installed in the church.**

**Control equipment and housing :** These should be sited and permanently installed towards the west end of the church, where the operator can hear and observe, and readily make any necessary adjustments. In order to accommodate the control equipment it may be necessary to reduce the length of a pew and provide equipment housing to match existing furniture. This in turn may mean employing a specialist furniture/wood worker. Such consideration is a major item and will require prior consultation with the architect and DAC. In addition to the sound mixer and other equipment, you will need:

- Space for the safe storage of accessories like radio microphones, spare batteries, cabling, etc.
- An adjacent power supply with 30mA residual current device (RCD) protection
- Lockable security, and possibly a localised security alarm.

**Radio Microphone aerials :** These should be permanently installed as inconspicuously as possible in a location that ideally provides 'line of sight' coverage of the area where the radio microphones will be used.

**Fans and fan noise :** Select equipment which does not require an internal cooling fan. Silence is important in worship and fan noise increases with age due to the build up of dust, resulting in imbalance of the fan and consequential wear to the fan bearings.

**Loop systems :** A loop system is most efficiently installed approximately one metre above or below ear level. If there is no dado rail which would conceal it then consider the possibility of installing induction loop cabling under the floor. The loop should cover the whole worship space (including the sanctuary area) so as not to create 'no-go' areas. The provision of a simple test unit is strongly recommended so that operators without hearing aids are able to test the correct functioning of the loop system. Installing loop systems can sometimes attract small grants to help defray costs.

**Documentation :** At the time of installation, a file should be provided with relevant details of the sound system installation. As a minimum, this should include a wiring schematic and plan showing location of equipment as well as the original manuals supplied by the manufacturer of the equipment.

**Training :** Any sound system will benefit from skilled operation. As a minimum, someone who can turn off microphones that are not in use and adjust the volume will greatly improve the intelligibility of the system. These skills can be taught easily to most – especially those with a musical bent. Sessions of training should be included within the original scheme and budget. Subsequently, if the necessary skills should no longer be available in a church, further training should be provided.

**Operation :** To ensure reliability it is important that the sound equipment is operated and maintained by a small number of responsible operators (say 2-3) who should have similar average hearing faculties.

**Safety :** All power supplies to sound equipment - in particular to musical instruments - should be derived from double pole switched socket outlets, protected by a 30mA RCD. Such electrical supplies should be installed by a suitably qualified electrician and provided with a test certificate upon completion of the installation. In common with the complete electrical installation in the church, this should be tested regularly, at least every 5 years.

**Maintenance :** Once installed, the sound system will require little maintenance except the replacement of radio microphone and other batteries. However, regular checks should be made to ensure that the system is working correctly and that no interference has been introduced. Any concerns that the church may have about the way the system is working should be addressed to the installer or other suitably experienced technician.

**A Faculty is needed to install a sound reinforcement system. A loop system on its own may be installed under Minor Works (paragraph B:5)**

Full details of the proposed installation must be submitted, including

- the position of cables, speakers and control equipment, together with a plan indicating these;
- catalogue photos of equipment, including the loudspeakers;
- the contractor's detailed quotation;
- photos of the church with the proposed location of the speakers and any cabinet marked;
- If a cabinet is required to house the equipment, full details of its measurements, material, design and location must be submitted.
- Confirmation that the church's architect/surveyor is content with the proposals.

## **Deaf People in Church – Why install an Induction Loop?**

Loop systems have been installed in churches long before the Disability Discrimination Act (2004) required the provision of facilities to help all those with hearing loss. A good loop amplifier system can be a real help to the severely deaf, but it is only part of the answer because it assumes a person with a hearing loss has and is using a hearing aid; the hearing aid has a T-switch fitted and that the hearer uses this facility.

1 in 7 people in the UK has hearing difficulties. Within this, there are three broad categories of people with hearing loss:

**Slight** - in which virtually no one uses a hearing aid but they can have difficulties hearing all parts of the service

**Moderate** - in which now about 70% of people have a hearing aid. This is the group where more and more people are now benefiting from the use of digital hearing aids. However, very few people use the T-switch position (allowing them to listen to the loop system) even if they have one fitted to their aids. A good sound reinforcement system will enable the majority of those with moderate hearing loss *and* using hearing aids to hear all parts a church service clearly. If people with good hearing can hear a service well, then those with digital hearing aids, should be able to do the same.

**Severe** - The severely deaf divide into two groups: those who have used hearing aids for a long time and know how to get the best from them, and those who have been fitted with hearing aids late in life and have great difficulty getting much benefit from them. It is this latter group where much work needs to be done so the person can benefit by using a hearing aid coupled with a loop system.

Some churches expect to turn on their sound system at the beginning of the service and leave it on until it is switched off at the end. This means that all the sounds from the various microphones are feeding into the sound system and the loop amplifier is likewise being fed with sounds that are unwanted as well as wanted. If a loop system or sound reinforcement system is to be effective without background noise, someone should control the sound during the service. This is where young people can be encouraged to take part in a rota of operators. A poorly installed loop amplifier can also be prone to interference, so increasing the problems of a person trying to make use of it.

A good, well designed sound reinforcement system will help many people with a hearing loss to hear better in church, regardless of their level of deafness and whether or not they use a hearing aid. This is especially true if someone is available to operate the system during services. A good, well designed and installed loop amplifier will benefit those people who find the sound reinforcement system unsatisfactory and can be encouraged to use the T-position of their hearing aids.

The cost of a loop system is only a small part of the overall costs for a sound system and can sometimes attract small grants in order to defray costs.

(Another simple way to enable people with hearing loss to be able to access worship is to improve visibility, since many people use lip-reading as an adjunct to understanding of what is being said. Provision of written material is also helpful, such as scripture readings, prayers and sermons and this will allow those who have a more significant hearing loss to follow the service more easily.)

### **Further Sources of Information**

**CCC publication** : Sound Amplification in Churches (1990)

This advice and information is given in good faith and is based on our understanding of the current law. The DAC cannot accept any responsibility whatsoever for any errors or omissions which may result in injury, loss or damage including consequential or further loss. It is the responsibility of the PCC to ensure that it complies with its statutory obligations.

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