

**DIOCESE OF CHELMSFORD**  
**DIOCESAN ADVISORY COMMITTEE**

**SOUND REINFORCEMENT  
SYSTEMS IN CHURCHES**

GUIDELINES TO ASSIST PARISHES

Revised March 2006





# **SOUND REINFORCEMENT SYSTEMS IN CHURCHES**

## **INTRODUCTION**

- 1.1 Sound reinforcement systems are increasingly required with more lay participation in services. The same need is experienced when coping with the 'background noise' of family services. The size of church is of course a factor although relatively small parish churches have installed such systems beneficially. The system requires to be tailored to the church's services and also to the building's acoustics (see below). An important consideration (particularly with a listed church), is the position and appearance of the equipment to ensure that it is not visually intrusive. The purpose of the installation is to make the spoken word more audible either in volume or clarity, or both. A church with much inherent reverberation or echo may be ideal for music but to amplify speech in such conditions from two large speakers for instance, can only increase the echo and create loss of clarity of speech by the increased sound reflections. It is essential that a specialist contractor is employed who is experienced in dealing with such conditions and who also knows how to position wiring and speakers correctly. For these reason, the DAC cannot normally recommend DIY installations.

## **CHURCH ACOUSTICS**

- 2.1 The importance of taking into account the building's acoustics cannot be over stressed. Many hard surfaces of floors, walls and ceilings/roofs can create unwanted sound reflections which sometimes are acceptable for music, but not for clarity of the spoken word. For

example, reordering of one large church by the removal of pews and wooden floor and replacing with chairs on a marble floor, has created additional sound reflections which have caused a serious loss of clarity to speech audibility. The reverse of hard surfaces in the form of carpets and curtaining can on the other hand provide too much sound absorption and deaden the acoustics to an unacceptable degree. One church introduced so much extra carpeting that the original sound system became ineffective and needed total replacement. The reordering of chancels often involves extra carpeting which in some churches has created an imbalance of sound between chancel and nave.

- 2.2 Some existing churches have narrow chancel arches, which tend to restrict the sound of the choir and organ for the congregation and the process of amplification is a delicate one, not always ideal in effect. The screening of the west end, often with glazed partitions, can introduce new sound reflections which must be addressed at design stage. The removal of pews and their replacement with chairs and a different floor surface can affect acoustics to a degree. This applies both in chancels and naves.
- 2.3 It is often mistakenly assumed that the determination of a building's acoustics is a hit and miss exercise. This is not so; it is a specialist science which can be effectively applied. The DAC is prepared to give advice when a sound system is being considered.

## **MICROPHONES**

- 3.1 The choice of microphones is dependent on whether speaking positions are relatively fixed, e.g. pulpit, lectern, where fixed microphones are most suitable. When there is a need for an occasional position in front of the chancel arch, a stand microphone can be used by plugging into an appropriately positioned socket.

3.2 The altar microphone can be in a form specially designed for this purpose, set unobtrusively in a small white foam pad resting on the altar and sometimes called a 'mouse mike'. They are perfectly adequate for amplifying any speech facing the altar from either side. Wired clip-on type microphones appear to give some degree of movement but require plugging and unplugging when moving from one position to another. They also have long leads which are potentially hazardous. Considerable flexibility of movement is given by radio microphones which can be of the clip-on type or the hand-held type. Their advantage is to obviate wiring. They can also dispel the need for a separate altar microphone. The clip-on types have their own small transmitters which can be worn under vestments or in convenient pockets. Each transmitter has an on/off switch to be operated by the user. The hand-held type also has its own on/off switch. This facility can be an occasional nuisance when the user forgets to switch on or off at the appropriate time. They can also be used on stands or clip brackets i.e. as a conventional microphone but without the wiring. Double diversity receivers can ensure even radio contact. When fixed mikes are used, all may be 'live' and each user addresses himself to them when required. A master volume control is sited at the back of the church to enable a churchwarden to adjust during the service in exceptional circumstances. Most successful church installations follow this method with the minimum of trouble. No one leading the worship should need to even think of the operation of the sound reinforcement and should not need to plug in or switch on microphones. All fixed microphones should be black and ideally of the miniature 'pencil' type which are visually unobtrusive.

## **SPEAKERS**

- 4.1 The size, shape and position of speakers are dependent upon the individual conditions of the church. There are many types available which cater for mainly voice reinforcement, or for both voice and music reinforcement. The former types are usually quite adequate for relaying music tapes or CD's.
- 4.2 They need not be large and their siting is of prime importance to ensure good distribution of sound and acceptably unobtrusive appearance, by blending with the colour of the surface to which they are fixed. There are also flat panel speakers which can be in the form of pictures or hymn boards.
- 4.3 The wiring to speakers must also be coloured to match the background to which it is fixed and should always be run behind mouldings and in corners etc., and not across wall surfaces.
- 4.4 Where excessive reverberation or echo is inherent in the church, the use of several small speakers dispersed in position and operating at low volume, helps to ensure a degree of clarity of amplified speech. An alternative solution is to position two speakers at high level in front of the chancel arch and directed down diagonally over the congregation to avoid unwanted sound reflections from the wall surface.

## **AMPLIFIER**

- 5.1 The amplifier controls each microphone output, in addition to providing, if required, a tape recording outlet and/or inlet.
- 5.2 Its power output will be as recommended by the specialist employed.

- 5.3 It is normally pre-set for the individual microphones with a master volume control.
- 5.4 Ideally the volume control should be sited separately at the back of the church to enable any adjustment to be made unobtrusively by a churchwarden during the service. This is rarely necessary if the amplifier has been properly pre-set. In the case of a more sophisticated system involving the amplification of music groups and/or many microphones, a sound desk with operator is necessary. This should be at the back of the congregation with clear vision and sound of the microphones users. It should be in a lockable cabinet which matches the finishes of the surrounding church furniture. Portable sound desks are also available that can be plugged into a suitable socket when required. In each case, a trained operator is essential.
- 5.5 The siting of the amplifier should be in a secure place such as a locked vestry or a locked cabinet. If the latter, it must be aesthetically sympathetic to its position.
- 5.6 The amplifier must be sited by a main electrical outlet (13 amp.).

## **INDUCTION LOOP**

- 6.1 An induction loop should be installed for those using hearing aids in order to comply with the Disability Discrimination Act. This facility allows those with hearing aids to 'tune in' to the service which is being broadcast through the microphones.
- 6.2 The loop cable is usually laid at low level around the seating area and is virtually invisible.



- 6.3 The loop amplifier should be sited by, or combined with, the main system.
- 6.4 A notice should be displayed stating that an Induction Loop is installed for those using deaf aids.

## **FACULTY**

- 7.1 A faculty is necessary for such systems and the application submitted to the DAC for a certificate should include full illustrated details of the equipment to be used, including the size and finish of the speaker cabinets, with their position and that of the microphones clearly indicated on a plan of the church.

## **SPECIALIST CONTRACTORS**

- 8.1 It is not the function of the DAC to specify or nominate contractors. However, the following contractors have carried out many satisfactory installations in the Diocese. This is not to be taken as an authorised list.

**Christian Fabrications Ltd**, Communications House, 5 Chase Side Crescent, Enfield, Middx, EN2 0JQ (020 8364 6411) [www.christianfabrications.co.uk](http://www.christianfabrications.co.uk)

**Cosmic Electronics**, 62 Ongar Road, Brentwood (01277 216078)

**DM Music for Churches**, Unit 4, Riverside Estate, Coldharbour Lane, Harpenden, Herts. AL5 4UN (01582 761122)

**Electronic Audio Systems**, 24 Stanley Place, Ongar CM5 9SU (01277 362450)

**Golding Audio Ltd.**, Unit 8, Peartree Business Centre,  
Stanway, Colchester, CO4 5JN (01206 762462)

**R.G. Jones Sound Engineering**, 16 Endeavour Way,  
Wimbledon SW19 8UH (0181 971 3100)

**Sound and Vision Electronics**, The Triangle, Frinton-  
on-Sea CO13 OAU (01255 673766)

**Soundtrack (Audio-Visual) Ltd.**, 23 Farriers Way,  
Temple Farm Industrial Estate, Southend-on-Sea SS2  
5RY (01702 619583)

**Solitech**, 15 knights Way, Milton, Cambridge, CB4 6DE  
017802 673278

**Soundabout**, 135 Hereward Close, Impingdon,  
Cambridge, CB4 9YF, (01223 237200)

**BH Sound**, The Old School Studio, Crowland Road,  
Eye, Peterborough, PE6 7TN, (01733 223535)

**John Hearn & Son**, Challenge Way, Colchester, CO1  
2LY, (01206 793536)

**Vine Audio**, 129 Vinery Road, Cambridge CB1 3DW  
(01223 571560)

**Kel Sound & Vision**, PO Box 4205, Hornchurch RM11  
1WD (01708 509633)

**B & J Stevenson**, 19 Peverel Road, Cambridge CB5  
8RN (01223 241901)

**Sound Marketing**, 6 Europe Way, Martinau Lane,  
Norwich NR1 2EN

# POLICY

1. Specialist advice should be sought as any installation must take into account the building's acoustics.
2. Speakers should be unobtrusive and of a size, shape and colour to suit their position and background.
3. Fixed microphones should be matt black and of the pencil type.
4. All exposed wiring should match the colour of the surface to which it is fixed, with hot glue fixing in preference to clips. Plastic trunking is to be avoided.
5. The amplifier and control equipment, if not in the vestry, should be housed in a lockable cabinet which matches the church furniture.
6. Induction loops for the hard of hearing should be provided and surround the whole of the seating area.
7. DIY installations are not recommended.
8. The DAC is willing to give advice on sound systems.

This is one of a series of DAC Guidance Notes obtainable from the Diocesan Resources Centre (Tel: 01245 294405).



Diocesan Advisory Committee  
Diocese of Chelmsford  
53 New Street  
Chelmsford  
CM1 1AT

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