

All of the new induction loop equipment was also built into the, thankfully large, equipment rack!

**The Result**

Following initial commissioning time was spent on numerous occasions listening to different readers using the system and consulting with listeners to ensure that maximum satisfaction is being achieved from the system and that listeners have to make the minimum of effort to hear the readers clearly.

With a system of such capability it is possible, following this consultation, to make the fine adjustments necessary because of the very precise nature of the computer controlled signal processing at the front end and the application of precise loudspeaker dispersion at the point of delivery.

In terms of operation, the system is almost totally automatic requiring only volume adjustment of CD replay or the raising of the master level control to take account of larger services and congregations.

**Testimonial**

'The new sound system has made a remarkable difference and has already overcome its first challenge. During the Christmas services we were again confronted by a huge number of people with in excess of 1,300 people at our Family Mass and 1,100 people at our Midnight Mass. Both Masses were easily catered for in terms of sound as all we needed to

do, for this special occasion, was increase the master volume. However, it was the children's Mass which was noticeably different. It was so much calmer this year than in previous years.'

'I am sure that there are many other churches, with individual characteristics and quirks that have similar challenges to surmount. I am only grateful that, for us, these have been overcome.'

Fr. Martin Stone

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# The Art of Listening

## Core Theme

How busy is your church?

The primary theme of our year has been resolving sound reinforcement issues for churches who have found that their congregation has grown by a significant amount and that, without understanding the precise reason, find that their old sound system can no longer cope.

The problem was typically reported to us as "people sitting toward the back cannot hear" or "people are clustering around the loudspeakers in the porch" So what has occurred to cause this problem? how has something changed?, why did the sound system seem to work before but does not now?

When one is preparing to design a speech reinforcement system it is always necessary to take account of the distances between 'Talkers', microphones and loudspeakers if one is to achieve more than a minimum level of gain before feedback; it is also necessary, however, to remember to take account of the levels of background noise.

In all of these projects where the old system had ceased to achieve a satisfactory level of performance, there had been



Using the real time analyser

a marked increase in the number of people in the congregation which had brought an increase in background noise levels.

It also meant that more of the seating was used and so areas suffering poor intelligibility often had to be used out of necessity.

Our work has been to address and resolve these problems.

Please note our new address and telephone number.

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## Case Study

In autumn 2008 we were approached by the church of The Immaculate Heart in Middlesex to investigate the unsatisfactory level of gain before feedback and speech intelligibility being offered by their installed sound system.

The system could not go loud enough without going into feedback and appeared to receive then amplify background noise prevailing in the church resulting in many listeners not being able to hear the message of the service.

The church is a large building in excess of 30 metres long and 24 metres wide and whilst built within the last 50 years, is of traditional shape.

On meeting Fr. Martin Stone and discussing in detail the areas of concern I discovered that the level of performance that



setting up the calibrated microphone

was required from the sound system were on an altogether higher level than one may normally encounter.

This was primarily due to the size of the church causing a highly reverberant acoustic and the considerable size of the congregation; sometimes up to 1000 people, often causing considerable background noise in addition to that caused by a high power heating system.



Reverberation and high levels of background noise are highly destructive of intelligibility and place considerable demands upon the capabilities of any sound system.

The existing sound system comprised of more than 20 loudspeakers of a suitable type and quality and some useful amplification; however, piecemeal attempts had been made by contractors to address the problems by adding various items which had not been successful.

Thankfully, Fr. Martin had introduced a policy of using one make and model of microphone which did assist with achieving a consistent performance from the readers.

In most cases the loudspeakers were contributing to the problem by being installed incorrectly making it impossible to achieve the desired angle necessary to

make use of the dispersion characteristics of the loudspeakers that would provide the correct audio coverage.

So, our brief was to achieve the required and necessary gain before feedback and



Correct downward angle is essential

improve system performance sufficiently to discourage parishioners from huddling around one of the two ceiling speakers mounted in the porch where this had been one of the few places where one could hear!

### The Solution

It was recommended that actually removing some of the loudspeakers, perhaps to be used in other areas of the building, would be beneficial so as to less 'agitate' the considerable reverberance and re-installing others so as to achieve the desired audio coverage was likely to be a successful and cost effective route. It was also proposed that, again due to the length of the church, superior signal

processing offering delay, microphone gating and separate equalisation on all inputs and outputs would be essential.

Once our proposal was accepted our first task was to install all new loudspeaker cable to enable groups of loudspeakers to be formed and then driven by individual amplifiers.

At this point we took the opportunity to specify oxygen free copper loudspeaker cable for superior signal transfer and hence sound quality but sheathed in a low smoke zero halogen outer for safety in the event of fire.

The amplifiers were arranged electrically into separate groups which could, in turn, be fed by a processed signal uniquely matched to the requirements of that zone in the church.

The equipment rack was rebuilt to accommodate an Allen & Heath iDR8 signal processor, mixer and audio matrix two of the original amplifiers, one new dual channel amplifier and extensive mains power distribution and conditioning. It was also decided to carry out a total revue of the provision of support for the hard of hearing and as a result a new induction loop system was installed comprising of two Ampetronic loop drivers and associated transformers to enable smooth audio coverage of such a large space.

