

instrument review

Surround sound

John Wilson

IN an attempt to capture both the natural direction and reverberation of sound in a live performance, Professor Peter Felgett of the University of Reading and Michael Gerzon, an Oxford mathematician, are developing a new 'ambisonic' hi-fi system in association with IMF, a British loudspeaker manufacturer. The National Research Development Corporation holds the patents for the system and is backing the project financially.

The new technique improves on present quadrasonic systems because of its ability to present natural sound images between the front and rear pairs of speakers, and to reproduce sounds which seem to arise either between the listener and a loudspeaker or beyond it. Indeed Mr Gerzon believes that: "Quadrasonics, as at present widely conceived, is a dead end."

Unlike the conventional quadrasonic approach, where a separate channel is so often deemed necessary for each loudspeaker, the new ambisonic system uses information from a multidirectional microphone array encoded on just two channels. This should lead to the complexities and sophistication of surround sound techniques being relegated to the recording studio and not to the living room. Indeed, apart from two extra loudspeakers, suitably in phase, only a decoder will be necessary to convert an ordinary stereo system.

This new approach should not be confused with the so-called 'matrix'

systems where information from conventional microphones is artificially blended to achieve an approximation of surround sound. With ambisonics, sound from every direction reaching the tetrahedral microphone array is treated equally until the decoding operation.

Michael Gerzon, who Professor Felgett feels should take most of the credit, points out that an ambisonic system is not limited to four loudspeakers, although this is the number which is most attractive commercially. Since the microphones also pick up the sounds coming from above and below them, these too may be reproduced if six or more loudspeakers are used with the appropriate decoder. Three is the optimum number of channels for four speakers (and therefore fm radio transmission), five channels for six loudspeakers, six for seven and so on. The position of the loudspeakers must be very carefully worked out because they are not in the usual planar arrangement.

Nature hopes to publish an article describing the mathematics behind the new system in the fairly near future; but how does it sound in practice? The new system was demonstrated at the recent Sonex 74 exhibition in the Post House Hotel near London's Heathrow airport. Four expensive monitor speakers were supplied for the occasion by IMF but the signals themselves came from an ordinary Philips cassette.

Just before the demonstration began, a director of IMF, Mr John Wright, said a few words of warning about the acoustics in the demonstration room. He should have said more because the organisers could hardly have picked a

worse spot. One wall of polished mahogany bounced the sound like a mirror through an acoustically transparent partition opposite and even the other, more normal, wall was faced by a large window with heavy, absorbent curtains. So the demonstration was rather disappointing, particularly regarding the claim that the nearer a listener is to particular speaker, the less sound he is conscious of hearing from it. This simply could not be true in a room where the sound was escaping next door through one wall and being smothered in the curtains of another.

In spite of this one or two of the selections on the tape gave some idea of what an ambisonic system is capable. In particular, a fine piece of organ music produced the strong impression of being in an echoing church. Considering the real surroundings, this was no mean feat and Professor Felgett said that he hopes to arrange another demonstration in a more suitable location.

The technique is still very much in the experimental stage, with new directional microphones being developed, for example, and the inventors emphasise that they have no plans yet to market it themselves. Rather, they wish to attract the attention of recording studios and manufacturers with a view to licensing their invention—much in the same way as Dolby has licensed his method for 'stretching out' the hiss from tape recordings. In this respect Professor Felgett says that IMF is acting like "the good farmer" by seeking to develop the system for the benefit of all, although it naturally has a commercial interest in being in the forefront of a new technique.

matters arising

The information problem

SIR,—K. L. and M. L. Blaxter, in their article *The individual and the information problem* (*Nature*, 246, 335) make some incidental remarks which cannot pass unchallenged. They say, for example, that the "so-called information explosion . . . apparently causes consternation to librarians, archivists and information scientists". No evidence is quoted

in support of this suggestion, perhaps because it would be difficult to come by. Whatever consternation exists is, in fact, more likely to be found among the ranks of the users than of those of us professionally engaged in dealing with the problem. We are far too busy actually harnessing the forces of the information explosion to have time to strike attitudes of consternation.

Bryan¹ summed up the viewpoint of

many librarians when he argued that the information problem is essentially a users problem, and not primarily a technical problem. The remark is also unfortunate in that it seems to imply an inactivity in the face of crisis; a glance at, for example, the current issue of *Library and Information Science Abstracts* may help to dispel this misconception. Most of the Blaxters' findings are already well known to librarians, and we need no convincing